

**National Indian Gaming Commission
Record of Decision**

**Approval of Management Contract for Gaming Facility at the
Wilfred Site in Sonoma County, California, for the Federated
Indians of the Graton Rancheria**

NATIONAL INDIAN GAMING COMMISSION

ACTION:

Record of Decision (ROD) for the approval of a management contract for a gaming facility to be located at the 252-acre Wilfred Site (Preferred Alternative) in Sonoma County, California, pursuant to 25 U.S.C. § 2711 for the Federated Indians of the Graton Rancheria (Tribe).

SUMMARY:

The proposed gaming facility to be located at the Wilfred Site in Sonoma County, California, for the Federated Indians of the Graton Rancheria was analyzed in a Draft Environmental Impact Statement (DEIS) issued for public review on March 9, 2007. The Draft EIS (DEIS) and the Final EIS (FEIS), issued February 27, 2009, considered various alternatives to meet the purpose and need of the Proposed Action and analyzed in detail the potential effects of various reasonable alternatives. After considering input received during the FEIS waiting period, the National Indian Gaming Commission (NIGC) has decided to choose a reduced intensity project. This reduced intensity project is described in more detail in this ROD and is referred to as Variant H-sub1. A Notice of Intent (NOI) was issued May 7, 2008 to accept the Wilfred Site into trust by the United States for the Tribe's benefit. A federal court subsequently dismissed a lawsuit challenging the decision to accept the Wilfred Site into trust on April 21, 2009, which ruling has been appealed to the Court of Appeals for the 9th Circuit. Once in trust, the Wilfred Site would be eligible for gaming under the Indian Gaming Regulatory Act (IGRA). With the issuance of this ROD, the National Indian Gaming Commission (NIGC) announces that Variant H-sub1 as described in this ROD is the Preferred Action and is the action to be implemented. The NIGC has determined that Variant H-sub1 would not create significant, unmitigated impacts to the human environment after the implementation of mitigation measures contained in this ROD. The NIGC decision is based on its review of the DEIS, the FEIS, the entire administrative record and comments received from the public, federal agencies, state agencies, local government entities, and potentially affected Tribes.

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Table of Contents

1.0	INTRODUCTION.....	1
1.1	Description of the Proposed Project	1
1.2	Procedural Background.....	1
2.0	ANALYSIS OF ALTERNATIVES.....	2
2.1	Alternative Screening Process	2
2.1.1	Non-Casino Alternatives	3
2.1.2	Alternative Casino Sites	4
2.1.3	Alternative Casino Sizes	6
2.2	Reasonable Alternatives Considered in Detail	7
2.2.1	Alternative A - Proposed Project	7
2.2.2	Alternative B - Northwest Stony Point Casino	9
2.2.3	Alternative C - Northeast Stony Point Casino.....	10
2.2.4	Alternative D - Reduced Intensity (Stony Point Site)	10
2.2.5	Alternative E - Business Park.....	10
2.2.6	Alternative F - Lakeville Casino.....	11
2.2.7	Alternative G - No-Action	12
2.2.8	Alternative H - Reduced Intensity (Wilfred Site)	12
2.2.9	Variant H-sub1 - Wilfred Site Reduced Intensity Casino	12
3.0	ENVIRONMENTAL IMPACTS AND PUBLIC COMMENTS	13
3.1	Environmental Impacts Identified in the Final EIS	13
3.1.1	Geology and Soils	14
3.1.2	Water Resources.....	14
3.1.3	Air Quality	15
3.1.4	Biological Resources.....	15
3.1.5	Cultural Resources	17
3.1.6	Socioeconomic Conditions and Environmental Justice	18
3.1.7	Resource Use Patterns	18
3.1.8	Public Services	20
3.1.9	Other Values.....	20
3.1.10	Indirect and Growth-Inducing Effects.....	21
3.1.11	Cumulative Effects.....	22
3.1.12	Unavoidable Adverse Effects.....	22
3.2	Response to Comments on the Final EIS	22
4.0	PREFERRED ALTERNATIVE	22
5.0	ENVIRONMENTALLY PREFERRED ALTERNATIVE(S)	23
6.0	MITIGATION MEASURES.....	23
6.1	Geology and Soils	24
6.2	Water Resources	24
6.3	Air Quality	29
6.4	Biological Resources	36
6.5	Cultural Resources.....	39
6.6	Socioeconomic Resources	40
6.7	Transportation/Circulation.....	41

6.8	Public Services.....	46
6.9	Noise.....	50
6.10	Hazardous Materials.....	51
6.11	Aesthetics	53
6.12	LEED Certification.....	54
6.13	Mitigation Measures that are not Adopted	54
7.0	DECISION	54
8.0	SIGNATURE	55

Attachment 1 - Notice of Final Determination to Take Land into Federal Trust

Attachment 2 - Tribal Resolution 09-03-GC

Attachment 3 - Variant H-sub1

Attachment 4 - Variant H-sub1 Technical Studies

Attachment 5 - Responses to Public Comments on FEIS

Attachment 6 - Mitigation Monitoring and Enforcement Plan

Attachment 7 - PM_{2.5} Technical Memorandum

1.0 INTRODUCTION

1.1 DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, the NIGC would approve a management contract for the proposed gaming facility to be located at the 252-acre Wilfred Site in Sonoma County, California, for the Federated Indians of the Graton Rancheria. The Tribe's gaming management agreement is with SC Sonoma Management, LLC (SC Sonoma). The Tribe's proposed project is a casino/hotel resort development on the Wilfred Site. The facility would include gaming conducted in accordance with the Indian Gaming Regulatory Act, 25 U.S.C. § 2701-2721 (IGRA), and requirements within a Tribal-State Gaming Compact between the Tribe and the State of California. On the site, the Tribe has proposed development of a 408,150 square foot (sf) casino development, 8-story, 300-room hotel, 1,500 seat show room, and 6,100 space parking facility.

After considering input received during the FEIS waiting period, the NIGC has decided to include a new reduced intensity version of this project (Variant H-sub1). During the course of the NEPA process the NIGC decided that the most appropriate alternative to select as the Preferred Alternative would be Variant H-sub 1. Variant H-sub 1 includes a reduced intensity project would include a 317,750 sf casino development and a 6-story, 200-room hotel (see Attachment 3 for more detail).

The Tribe is in need of a sustainable source of net income adequate to allow it to achieve self-sufficiency, self-determination, and a strong Tribal government, and to enable the Tribe to meet the needs of its members. The purpose of the Proposed Action is to generate a dependable stream of net income that the Tribe would use to perform the functions of a Tribal government and to meet the needs of its members in accordance with Federal policies enunciated in the IGRA, the Indian Reorganization Act (IRA), and related laws and regulations.

1.2 PROCEDURAL BACKGROUND

The Tribe and SC Sonoma have executed a management agreement setting out their dual obligations for the operation and management of the Tribe's gaming facility as required under IGRA. The management contract between the Tribe and SC Sonoma requires the establishment of a gaming enterprise on Indian lands for the conduct of gaming, in accordance with IGRA to serve the social, economic, educational, and health needs of the Tribe, and to increase the Tribal revenues and enhance the Tribe's self-sufficiency and self-determination. The Tribe seeks financial assistance and expertise from SC Sonoma for the management and operation of the gaming enterprise.

In accordance with the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations (40 C.F.R. Parts 1500-1508), the NIGC published a Notice of Intent (NOI) in the *Federal Register* on February 12, 2004 describing the Proposed Action, announcing the NIGC's intent to prepare an EIS for the Proposed Action, and inviting public and agency comments. An EIS Scoping Report was published in August 2004, which summarized all scoping comments. Due to the addition of an alternative site, the NIGC released a supplemental NOI (Federal Register September 29, 2005) and Scoping Report

(January 2006). Scoping comments from both reports were considered by the NIGC in developing the project alternatives and analytical methodologies presented in both the DEIS and the FEIS. During the NOI comment periods, the NIGC identified four Cooperating Agencies: the Bureau of Indian Affairs (BIA), the U.S. Army Corps of Engineers (USACE), the California Department of Transportation (Caltrans), and Sonoma County (County).

The Notice of Availability (NOA) for the DEIS was published in the *Federal Register* on March 9, 2007 (Volume 72, page 10749), initiating a public comment period. In response to public requests, the public comment period was extended to 88-days, 43 days longer than what is required by the CEQ NEPA Regulators. Two public hearings, presided over by retired Justice Harry Low of the California Court of Appeals, were held at the Spreckles Performing Arts Center in Rohnert Park, California on April 4 and at Wells Fargo Performing Arts Center in Santa Rosa, California on April 5, 2007.

In addition to comments received at the public hearings, written comments on the Draft EIS were received from 366 parties. Responses to the comments received were included in Appendix FF of the FEIS. The FEIS was issued on February 27, 2009. The 30-day waiting period ended on March 27, 2009. A summary of all comments received during this period that were not previously raised and responded to in the EIS process, and NIGC's responses to them are included in Section 3.2 of this ROD.

The Graton Rancheria Restoration Act (Restoration Act) of 2000 (25 U.S.C. Section 1300n) restored the Federated Indians of Graton Rancheria to federally recognized status after 44 years of termination under the California Rancheria Act. The Restoration Act allows the Tribe to establish a reservation through the fee-to-trust process, within its designated service area of Marin and Sonoma Counties. According to the Graton Rancheria Restoration Act, the "Secretary (of the Interior) shall accept into trust for the benefit of the Tribe any real property located in Marin or Sonoma County, California, for the benefit of the Tribe." The Restoration Act further provides that, "Any real property taken into trust for the benefit of the Tribe pursuant to this subchapter shall be part of the Tribe's reservation." 25 U.S.C. Section 1300n-3. The Tribe submitted a fee-to-trust application to the Secretary to take the Wilfred Site into trust, with the Assistant Secretary - Indian Affairs issuing a Notice of Final Agency Determination To Take Land into Trust on May 7, 2008 to accept the Wilfred Site into trust by the United States for the Tribe's benefit. The NIGC has determined that once the site is taken into trust it would qualify as Indian lands under IGRA.

2.0 ANALYSIS OF ALTERNATIVES

2.1 ALTERNATIVE SCREENING PROCESS

The Tribe pursued an extensive search to identify a property within Sonoma or Marin Counties that was environmentally and economically suitable for large-scale commercial development. Through comments during the scoping process and the Tribe's own environmental constraints analysis, various alternative locations were considered.

The Tribe initially identified, and subsequently purchased, an approximately 2,000-acre property located in southern Sonoma County in the vicinity of State Route (SR)-37 and the Lakeville Highway (Lakeville Site). Public notification of the Tribe's intentions to develop

on this site was met with widespread community, environmental, and political opposition. Much of the opposition focused on the sensitive nature of the property, traffic and visual impacts. Therefore, a decision was made to attempt to locate a more suitable and less environmentally controversial location.

The Tribe evaluated approximately 48 sites, eventually focusing on the Stony Point Site. During preparation of the EIS, numerous environmental constraints to the development at the Stony Point Site were identified, including wetlands and flooding. Therefore, the Tribe and its backers, at considerable expense, focused on a new alternative site. This 252-acre site is referred to as the Wilfred Site, which includes the southern 182 acres of the previously evaluated Stony Point Site, plus a 70-acre portion of land to the northeast of the Stony Point Site, located along Wilfred Avenue. A range of possible alternatives to meet the purpose and need were considered in the EIS, including non-casino alternatives, alternative sites, and alternative development configurations. These alternatives include gaming and non-gaming alternatives on three alternative sites in Sonoma County.

2.1.1 Non-Casino Alternatives

In the IGRA, Congress authorized the operation of gaming by Indian tribes as a means of promoting Tribal economic development, self-sufficiency and strong Tribal government, and for the regulation of such gaming as a means of generating Tribal revenue. In hearings on IGRA, Congress considered testimony indicating that gaming was the only source of funds available to Indian tribes to help them address the critical needs in Indian County.

Nevertheless, the Tribe considered various non-gaming business opportunities and included the analysis of a non-gaming alternative (Alternative E) was included in the EIS. Ultimately, the following non-gaming alternatives were eliminated from further consideration because of the Tribe's limited financial resources and the significant resource needs of the Tribe and its members. These alternatives would not meet or would poorly meet the purpose and need for the Proposed Action. The Tribe has no capital reserves available for economic development purposes and lacks an adequate source of funding that would allow it to start up and sustain a non-casino economic development.

Vineyard and Wine Production Facility Alternative: The Vineyard and Wine Production Facility Alternative would consist of an approximately 300-acre vineyard and a 9,000-square-foot winery with a tasting room. This alternative was not feasible for several reasons. Profits, return on investment, the ability to obtain working capital, and job creation were all very low. Profits were also found to be extremely volatile based on the dependency on a strong grape harvest.

Food Processing Facility Alternative: The Food Processing Facility Alternative would consist of an approximately 20,000-square-foot food processing facility. This alternative was not feasible for several reasons. Profits and job creation were very low. Return on investment would also be fairly low. No current or potential future customer base was identified. Finally, no source of startup capital was identified.

Premium Outlet Retail Shopping Center: The Premium Outlet Retail Shopping Center Alternative would constitute an approximately 200,000-square-foot, high-end, outlet-format, retail center. The shopping center would contain approximately 50 stores with an average size per store of 4,000 square feet. This alternative was not feasible primarily because heavy competition was anticipated with three nearby premium outlet retail shopping centers. These outlets are located in Petaluma, Napa, and St. Helena and are operated by Chelsea Property Group, an experienced operator of over 50 outlet centers across the United States. In addition, no source of startup capital was identified. This alternative failed to fulfill the needs of improving Tribal socioeconomic status and providing employment opportunities (see Section 1.4 of the FEIS).

Office Complex: The Office Complex Alternative would constitute an approximately 100,000-square-foot, mixed-use office and retail center. This alternative was not feasible for several reasons. Profits and return on investment would be very low. There is currently an oversupply of commercial/office square footage in the North San Francisco Bay Area. Finally, no source of startup capital was identified.

Light Industrial Complex: The Light Industrial Complex Alternative would constitute an approximately 100,000-square-foot light industrial complex. This alternative was not feasible for several reasons. Profits and return on investment were very low. There is currently an oversupply of commercial/light industrial square footage in the North San Francisco Bay Area. Finally, no source of startup capital was identified.

Retirement Community Development: The Retirement Community Development Alternative would constitute an approximately 300-unit high-end independent living community. Tenants would be high-functioning retirees living unassisted. The development would have several services and amenities including a dining program, 24-hour staffing, housekeeping services, an activities program, a pool, an exercise room, a game room, and a library. This alternative was not feasible primarily because of low job creation, as well as a lack of expertise to operate such a facility. In addition, no source of startup capital was identified.

2.1.2 Alternative Casino Sites

A number of additional alternative sites were also considered for inclusion in the EIS, but ultimately were eliminated from further consideration for the reasons stated below.

Cotati Alternative: The Cotati Alternative consists of a 60-acre alternative site for development of a gaming facility and hotel located near the City of Cotati. This site was not considered further for several reasons. The site is too small for development of a gaming facility and hotel, the freeway interchange is too small to accommodate increased traffic flows, a housing development was underway, and the site is located outside of the urban growth boundary of the City of Cotati.

Agilent Alternative: The Agilent Alternative consists of a 200-acre alternative site for development of a gaming facility and hotel located in the City of Rohnert Park. There are currently five large buildings encompassing approximately 700,000 square feet, and

associated parking on the site. A preliminary environmental analysis was conducted of the Agilent site to determine its feasibility when compared with the Stony Point Site (Alternatives B and C). This site was not further considered for several reasons, including the site is located adjacent to a large residential development that contains an elementary school and a large park. In consulting with the City of Rohnert Park, officials were extremely concerned with the proximity to this residential development and appeared unlikely to support the siting of the casino on the Agilent site. In addition, the Agilent site is not located near a major freeway. Thus, traffic would be forced to flow through a number of local streets in order to access the site.

Petaluma North Alternative: The Petaluma North Alternative consists of a 190-acre alternative site for development of a gaming facility and hotel. The site is located partly within the City of Petaluma and partly in Sonoma County. This site was not further considered due to the site being located within the 100-year floodplain, causing a potential for flooding. The site has insufficient traffic flow and inadequate access to US-101. Finally, City of Petaluma officials expressed concerns with each of the alternative locations in Petaluma that were considered.

Outlet Mall Alternative: The Outlet Mall Alternative consists of a 115-acre alternative site for development of a gaming facility and hotel located on the site of the Petaluma Outlet Mall. This site was rejected for several reasons, including the land footprint was too long and thin for development of a gaming facility and hotel, the site is located within the 100-year floodplain and is subject to flooding, and the site has poor access to freeway interchanges. Furthermore, a river runs through the property and wetlands are present. Finally, City of Petaluma officials expressed concerns with each of the alternative locations in Petaluma that were considered.

Petaluma South Alternative: The Petaluma South Alternative consists of a 128-acre alternative site for development of a gaming facility and hotel located in the City of Petaluma. This site was not further considered for several reasons. The site is adjacent to residential neighborhoods. Existing roadways restrict access to the site. In addition, the proposed gaming facility and hotel would potentially result in adverse traffic impacts on Lakeview Highway.

Wastewater Plant Alternative: The Wastewater Plant Alternative consists of an alternative site for development of a gaming facility and hotel. The site is located in the vicinity of wastewater disposal fields near the City of Petaluma. This site was not further considered for several reasons. The property appeared to contain extensive wetlands. In addition, the proposed gaming facility and hotel would potentially result in adverse traffic impacts on Lakeville Highway. Finally, the County desires the property for expansion of wastewater facilities.

Haystack Landing Alternative: The Haystack Landing Alternative consists of a 37-acre alternative site for development of a gaming facility and hotel located near the City of Petaluma. This site was ultimately rejected for several reasons. The land footprint is too long and thin and the site is too small for development of a gaming facility and hotel. Existing roadways restrict access to the site. The site is located on bay mud, which could potentially

cause foundation issues. A railroad runs through the property. The property has several potential environmental issues, including leach ponds. The property also contains wetlands, which are connected to the Petaluma River. The City of Petaluma and the County have both voiced opposition to this alternative location. Finally, a previous attempt by another tribe to put the land into trust failed.

Skaggs Island Alternative: Skaggs Island is a 4,400 acre island, which is the site of a former military base. It is located along the San Pablo Bay in southern Sonoma County. This site was suggested by commenters during the scoping period as an alternative site for the development of a gaming facility and hotel. This site was considered but ultimately eliminated from further consideration because it is now an integral part of the San Pablo Bay National Wildlife Refuge and slated for restoration. It is therefore not suitable for large-scale commercial re-development.

Hamilton Air Force Base Alternative: The former Hamilton Air Force Base is located in northern Marin County near the City of Novato. This site was suggested by commenters during the scoping period as an alternative site for the development of a gaming facility and hotel. This site was ultimately eliminated from further consideration for several reasons, as much of the former military base has already been redeveloped for office use, residential use, or wetland restoration, and is thus not available for reuse.

Mare Island Alternative: The former Naval shipyard at Mare Island is a 5,600 acre property located in Solano County, adjacent to the City of Vallejo. This site was suggested by commenters during the scoping period as an alternative site for the development of a gaming facility and hotel. This site was eliminated from further consideration because it is located outside of Sonoma and Marin Counties, which is outside of the Tribe's service area, as designated by the Graton Rancheria Restoration Act.

Mecham Road Landfill Alternative: The Mecham Road Landfill is a 170-acre property in central Sonoma County near the City of Petaluma. This site was suggested by commenters during the scoping period as an alternative site for the development of a gaming facility and hotel. This site was ultimately eliminated from further consideration for several reasons. First, this is still an operating landfill (albeit in limited capacity). Second, large-scale commercial developments are generally not well suited for redevelopment of landfill sites.

Sonomarin Drive In Alternative: The former Sonomarin Drive In is an approximately 40-acre former Drive In movie theater property located on the Sonoma/Marin County border near US-101. This site was suggested by commenters during the scoping period as an alternative site for the development of a gaming facility and hotel. This site was ultimately eliminated from further consideration for several reasons. First, the site is located next to a creek and is currently utilized for flood control purposes. Second, the site is not large enough to accommodate the proposed project.

2.1.3 Alternative Casino Sizes

Proposed Action Size: The proposed facility was sized based on an analysis performed by SC Sonoma using market information that considered many market and industry factors in order

to develop a project that attempts to balance revenues and risks to the Tribe without unnecessarily over sizing or under sizing the facility.

However, both a smaller and larger facility could be financially viable and could provide at least a portion of the financial resources needed to meet the Tribe's goal. Accordingly, a smaller casino was included as an alternative (Alternatives D and H) to the proposed project. A larger version was deemed unnecessary due to the potential for increased development and overhead costs and increased environmental impacts. An additional reduced intensity variant of the proposed project (Variant H-sub1 - see Attachment 3) was developed in consultation with the Tribe and SC Sonoma after receiving comments recommending the selection of a reduced intensity alternative during the FEIS waiting period.

2.2 REASONABLE ALTERNATIVES CONSIDERED IN DETAIL

2.2.1 Alternative A – Proposed Project

Under Alternative A, the Tribe would construct and operate a casino-hotel resort at the Wilfred Site and enter into a gaming management contract with SC Sonoma Management LLC, which would be approved by the NIGC. The Wilfred Site is located in central Sonoma County, California, and is comprised of 11 separate parcels. Ten of the eleven parcels are adjacent to the western boundary of the City of Rohnert Park, while one parcel lies within the boundaries of the City. The approximately 252-acre site is bordered by Wilfred Avenue, residences, and farmland to the north; Stony Point Road, residences, farmland, and a dairy to the west; Rohnert Park Expressway, Laguna de Santa Rosa, and farmland to the south; and a business park, the Rancho Verde Mobile Home Park, rural residences, and farmland to the east. Alternative A would include gaming conducted in accordance with IGRA and a Tribal-State Compact between the Tribe and the State of California. The casino-hotel resort would be approximately 762,300 square feet, including a 300-room, 8-story hotel.

The development of a casino-hotel resort is planned on approximately 66 acres in the northeast corner of the Wilfred Site. The remainder of the Wilfred Site would remain undeveloped and be used for open space, pasture, biological habitat, and recycled water sprayfields. The site would include 6,102 parking spaces through surface parking and a parking structure connected to the southeast corner of the casino. The majority of traffic would arrive via Wilfred Avenue.

A storm water management system is included in Alternative A, including two areas for stormwater detention located south of the hotel/casino development. The first stormwater detention basin would assure that post-development runoff peaks from the Wilfred Site would be equal to the existing conditions. Moreover, the basin would attenuate the increase in peak flow that would be generated by obtaining a permit to release 300,000 gallons per day of tertiary treated effluent from a proposed on-site wastewater treatment plant, should that wastewater disposal option be chosen. The detention of water on-site would reduce potential downstream flooding, erosion, and effects to water quality. Approximately 14 acre-feet of storage would be provided in the stormwater detention basin to account for the increase in runoff created by increased impervious surfaces. A second storm water detention / flood storage area is proposed to be created in the southern portion of the Wilfred Site. This detention area will allow for additional storage during a flood event to offset the loss of

storage resulting from the placement of fill on the Wilfred Site. The storm water facilities would be designed to comply with U.S. Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) general permit requirements for storm water discharge.

One off-site and two on-site options have been identified for treating the wastewater flow that would be generated by Alternative A. These options are described below:

- Option 1: Connect to the City of Rohnert Park sewer system. Treat and dispose of wastewater at the Laguna Wastewater Treatment Plant (WWTP), located two miles west of Wilfred Site. Effluent would be disposed to holding ponds for reuse for agricultural and urban irrigation, creation of wetlands and the Geysers Recharge Project for creating electricity. From October to May, a portion of the effluent would be discharged into the Laguna de Santa Rosa.
- Option 2: Construction of an on-site WWTP in the northeast area of the Wilfred Site, southeast of the Casino. Effluent would be disposed of through sprayfields in the southern half of the site from April to October, and in the Laguna de Santa Rosa via the Bellevue-Wilfred Channel during the remainder of the year.
- Option 3: Construction of an on-site wastewater treatment plant in the northeast area of the Wilfred Site, southeast of the Casino. Effluent disposed of through sprayfields of increased acreage in the southern half of the Wilfred Site from April to October and stored in an on-site reservoir during the remainder of the year.

Water for domestic use, emergency supply, and fire protection would be provided by on-site wells. Elements of the proposed on-site water facilities include two on-site wells (one for continuous supply and one for redundancy in case of malfunction or maintenance of the primary well), an iron and manganese treatment plant, a steel water storage tank, and a water distribution pump system. The approximate depth of the wells would be 650 feet and screening would occur between 200 and 650 feet below the surface. Water tank capacity would be based on fire flow requirements developed after review by local fire authorities. The estimated capacity would be approximately 1.2 million gallons, which would be stored in a welded steel tank designed to meet American Water Works Association (AWWA) specifications. A potable water pump station with two water pumps would convey water from the storage tank to facilities requiring potable water. The potable water main for the Wilfred Site would be sized for the peak daily demand.

If an on-site wastewater treatment plant is constructed, the water system would be dual plumbed for use of recycled water for such uses as landscape irrigation, toilet flushing, and cooling towers. If wastewater service is obtained from the Laguna WWTP, recycled water would be obtained from a connection to the City of Santa Rosa Subregional System. Recycled water from the Subregional System would be used for landscape irrigation only.

The Tribe has agreed in an Memorandum of Understanding (MOU) with the City of Rohnert Park to construct the gaming facility and all supporting buildings in accordance with standards no less stringent than those set forth in the Uniform Building Code, including all

Uniform Fire, Plumbing, Electrical, Mechanical, and related Building Codes, as adopted, amended, and incorporated into the Rohnert Park Municipal Code. Construction of the facility would also comply with the best management practices (BMPs), including BMPs for paving operations, structure construction, painting, material delivery/storage, material use, spill prevention/control, solid waste management, hazardous waste management, concrete waste management, sanitary/septic waste management, vehicle/equipment cleaning, vehicle/equipment fueling, and vehicle/equipment maintenance. In addition, construction activities would comply with all applicable federal standards, including Occupational Safety and Health Administration (OSHA) requirements and the federal Americans with Disabilities Act (P.L. 101-336, as amended, 42 U.S.C. Section 12101 *et seq.*).

Public safety services, consisting of law enforcement, emergency medical, and fire suppression services, would be provided by several jurisdictions surrounding the Wilfred Site. Absent an agreement with the Rohnert Park Police Department, and given that the majority of the site is currently located within the unincorporated area of Sonoma County, it is assumed that Sonoma County Sheriff's Department would have jurisdiction to provide primary law enforcement services to the hotel/casino resort under Public Law 280. A MOU between the Tribe and Sonoma County provides reasonable and fair share compensation for any public services provided by the County. Due to the proximity of Alternative A to the City of Rohnert Park and contributions for facilities in the Memorandum of Understanding (MOU) between the Tribe and the City of Rohnert Park, it is assumed that the Tribe would most likely contract with the City of Rohnert Park for fire protection and emergency medical services.

2.2.2 Alternative B – Northwest Stony Point Casino

The Stony Point Site is located in central Sonoma County, CA, adjacent to the western boundary of the City of Rohnert Park. The approximately 360-acre site consists of 37 separate parcels, bordered by Wilfred Avenue, residences, and farmland to the north; Stony Point Road, farmland, and a dairy to the west; Rohnert Park Expressway, farmland, and the Laguna de Santa Rosa to the south; and the Rancho Verde Mobile Home Park, a business/industrial park, and farmland to the east.

The development of a casino/hotel development would occur on approximately 76 acres of the northwest corner of the Stony Point Site. The design and components of the casino and hotel facilities would be identical to those of Alternative A, including construction standards and guidelines, as discussed above in Section 2.2.1. The exterior design of the casino-hotel resort would be very similar to Alternative A, although the exact layout of the various components of the casino-hotel resort would be reconfigured to accommodate the northwest corner of the Stony Point Site. The remainder of the Stony Point Site would remain undeveloped and be used for open space, pasture, biological habitat, and recycled water sprayfields.

A stormwater detention system would be provided on-site to reduce increased peak flows that would result from site development. A total of approximately 113.5 acre-feet of storage would be provided in the stormwater detention system to account for the increase in runoff created by increased impervious surfaces, encroachment of fill into the floodplain and the potential treated wastewater discharge into the Bellevue-Wilfred Channel.

The wastewater treatment facility for Alternative B would not change in size or scope from that proposed for Alternative A and would also be designed to comply with standards established by the USEPA. Wastewater disposal would take place by either Option 2 or Option 3 described above in Section 2.2.1. Water for domestic use, emergency supply, and fire protection would be provided by on-site wells, similar to Alternative A.

The provisions for construction standards and public safety services (law enforcement, emergency medical services, and fire protection) within the MOUs described in Section 2.2.1 (above) for Alternative A would apply equally to Alternative B.

2.2.3 Alternative C – Northeast Stony Point Casino

Under Alternative C, the development of a casino-hotel resort is planned on approximately 101 acres of the northeast corner of the Stony Point Site (describe above in Section 2.2.2). The remainder of the Stony Point Site would remain undeveloped and be used for open space, pasture, biological habitat, and recycled water sprayfields. The components of the casino-hotel resort would be the same as those proposed for Alternatives A and B.

Wastewater treatment and disposal for Alternative C would be provided by one of two on-site options (Option 2 or Option 3). The wastewater treatment facility planned for Alternative C would not change in size or scope from that proposed for Alternative A and would also be designed to comply with standards established by the USEPA. Water for domestic use, emergency supply, and fire protection would be provided by on-site wells, similar to Alternative A.

The provisions for public services described in Section 2.2.1 for Alternative A would apply equally to Alternative C.

2.2.4 Alternative D – Reduced Intensity (Stony Point Site)

Alternative D consists of a scaled-down version of Alternative B, located at a similar location on the northwest corner of the Stony Point Site. The 413,400 square foot casino/hotel development would consist of facilities similar to those described in Alternative B (Section 2.2.2), without the construction of a spa or events center. A total of 4,650 parking spaces would be provided to serve the patrons and employees of the resort and supporting facilities.

Drainage, water supply, and wastewater disposal methods would be similar to those proposed within Alternative B. Public service agreements would additionally be similar to those within Alternative B. Yet, given the reduced size and scope of the casino-hotel resort proposed for Alternative D, the terms of the MOUs with the City (the City MOU would apply, but the Tribe would likely assert the right to renegotiate certain terms) and County are not expected to apply to Alternative D. The agreements can be amended, however, to account for the reduced intensity of development.

2.2.5 Alternative E – Business Park

Alternative E consists of the development of an approximately 500,000 square foot business park on the northwest corner of the Stony Point Site. Under this alternative the NIGC would not need to approve a gaming management contract between the Tribe and SC Sonoma, and the Tribe would likely need to seek another source of development funding as SC Sonoma and its affiliates are not expected to support a development not related to a gaming operation.

The business park development would include approximately 400,000 square feet of light industrial uses and 100,000 square feet of commercial uses, with 2,000 parking spaces. The remainder of the site would remain undeveloped and used as open space, pasture, biological habitat, and recycled water sprayfields.

A stormwater detention system similar to that planned for Alternative B would be provided on-site to account for the increase in runoff created by increased impervious surfaces. Wastewater disposal options would also be similar to Alternative B.

Water supply and public service provisions are similar to those described under Alternative D (Section 2.2.4). The terms and provisions of the MOUs between the Tribe and the City of Rohnert Park and Sonoma County would not apply to Alternative E, however an amendment can be achieved to account for the shift in development.

2.2.6 Alternative F – Lakeville Casino

Alternative F consists of the development of a casino-hotel resort at an alternative off-site location. Alternative F consists of a casino/hotel resort development located in southern Sonoma County near the intersection of Lakeville Highway and SR-37 (Lakeville Site). The western boundary is at the Petaluma River, nearly two-miles west of the Lakeville Highway along SR-37, and the eastern boundary is at the Sonoma Mountains, less than two-miles east of the Lakeville site. The San Pablo Bay is just south of the Lakeville site, approximately 2.2-miles south of the site. The casino and hotel would be developed just west of Lakeville Highway on approximately 79 acres in the central portion of the approximately 322-acre Lakeville Site. The remainder of the Lakeville Site would remain undeveloped and be used for open space, pasture, biological habitat, and recycled water sprayfields. The components of the resort would be identical to those proposed for Alternative A.

On-site detention basins would be provided to reduce increased peak flows that would result from developing the site. These basins would assure that post-development runoff peaks from the Lakeville Site would be equal to the existing conditions, reducing downstream flooding, erosion, and water quality impacts. A total of 152 acre-feet of storage would be provided in the stormwater detention system.

Water for domestic use, emergency supply, and fire protection would be provided by on-site wells (one primary well and one backup well). Water demand would be similar to Alternative A. The wastewater treatment facility planned for Alternative F would not change in size or scope from that proposed for Alternative A and would also be designed to comply with standards established by the USEPA. On-site wastewater disposal would take place by one of the following two options:

- Option 1: Effluent will be disposed of through sprayfields in the southern half of the Lakeville Site from April to October, but water produced during the wet season will be disposed of in an on-site stream tributary to the Petaluma River.
- Option 2: Effluent will be disposed of through sprayfields of increased acreage in the southern and western halves of the Lakeville Site from April to October and stored in an on-site reservoir or wetlands during the remainder of the year.

Given the different location of the casino-hotel resort proposed for Alternative F, the public service provisions within the City of Rohnert Park MOU would not apply to Alternative F. According to the Sonoma County MOU, the MOU may apply to properties other than the Stony Point Site with the concurrence of the County. The Tribe would most likely contract with the Lakeville Volunteer Fire Department for fire protection and emergency medical services, and the County or other law enforcement agency for law enforcement.

2.2.7 Alternative G - No-Action

Under the No-Action Alternative (Alternative G), the NIGC would not approve a management contract between the Tribe and SC Sonoma. As a result the Lakeville and Stony Point Sites, with no known development plans for the future, would remain in their current condition. However, it is foreseeable and highly probable that in the future, some other form of commercial and residential development would occur on at least a portion of the Wilfred Site. It is assumed that the Wilfred Site would be subject to guidelines within the City of Rohnert Park Northwest Specific Plan Southern Area (Southern Specific Plan). The Southern Specific Plan calls for intensive commercial, industrial and residential development on the northeast portion of the Wilfred Site.

2.2.8 Alternative H – Reduced Intensity (Wilfred Site)

Alternative H was added as a result of input received during the supplemental scoping period. A description and summary analysis of Alternative H was included in the DEIS. A comprehensive analysis was included in the FEIS. Alternative H is a reduced intensity casino alternative with the same components as the reduced intensity Alternative D but located on the Wilfred Site. The 413,400 square foot casino/hotel development would consist of facilities similar to those described in Alternative D. A total of 4,649 parking spaces would be provided to serve the patrons and employees of the resort and supporting facilities.

Drainage, water supply, wastewater disposal methods, and public service agreements would be similar to those proposed within Alternative A.

2.2.9 Variant H-sub1 – Wilfred Site Reduced Intensity Casino

Variant H-sub1 was added to this ROD as a result of comments received on the FEIS. Variant H-sub1 is a 534,900 square foot casino/hotel development that would be in between Alternatives A and H in size and components. A total of 5,511 parking spaces would be

provided to serve the patrons and employees. Variant H-sub1 reduces impacts as compared with Alternative A by reducing the square footage for casino gaming from 80,000 sf to 65,000 sf (the same as Alternative H), by eliminating the show room, and by reducing the hotel size from 300 rooms to 200 rooms (thereby also reducing the building height by two stories) while sharing the same components as Alternative H except that Alternative H had only 100 hotel rooms, and a spa, a restaurant, and prefunction banquet space would be retained from Alternative A (see Attachment 3 for more detail). Variant H-sub1 was also designed to reduce impacts to wetlands below the amounts impacted by both Alternative A and H. Drainage, water supply, wastewater disposal methods, and public service agreements would be similar to those proposed for Alternative A.

3.0 ENVIRONMENT IMPACTS AND PUBLIC COMMENTS

3.1 ENVIRONMENTAL IMPACTS IDENTIFIED IN THE NEPA PROCESS

A number of specific issues were raised during the EIS scoping process and public and agency comments on the Draft EIS. Each of the alternatives considered in the FEIS was evaluated relative to these and other issues. The categories of the most substantive issues listed in the scoping document include:

- Land Resources (Geology and Soils);
- Water Resources;
- Air Quality;
- Biological Resources, including threatened and endangered species and their habitat;
- Cultural Resources;
- Paleontological Resources
- Socioeconomic Conditions
- Transportation/Circulation
- Land Use
- Public Services
- Noise
- Hazardous Materials
- Aesthetics
- Indirect and Growth Inducing Effects
- Cumulative Effects

The evaluation of impacts included consultations with entities that have jurisdiction or special expertise to ensure that the impact assessments for the FEIS were accomplished using accepted industry standard practice, procedures and the most currently available data and models for each of the issues evaluated in the FEIS. Mitigation measures identified in the design process have been incorporated into the project description. Alternative courses of action and mitigation measures were developed in response to environmental concerns and issues. As described in Attachment 3, the Variant H-sub1 components and overall size of the facilities falls in between Alternatives A and H. Therefore the environmental impacts from Variant H-sub1 generally also fall in between the environmental impacts reported in Section 4.0 of the FEIS for Alternatives A and H. Nonetheless, in the interest of public disclosure and in order to ensure mitigation measures in Section 6.0 of the ROD are applicable to Variant H-

sub1, an additional analysis of the environmental consequences of Variant H-sub1 is included in Attachment 3.

The effects of the alternatives have been evaluated in the NEPA process as follows:

3.1.1 Geology and Soils

Topography - All development alternatives would involve clearing and grading. The alternative sites are essentially flat, and the result of on-site grading would not alter this characteristic. Fill would be incorporated into on-site grading in order to facilitate proper drainage. Operation of the alternatives would not cause significant disturbance to topography.

Soils/Geology - All alternatives are likely to increase the potential for erosion, but not significantly with proper engineering and best management practices included within project design. The Wilfred Site, Stony Point Site, and Lakeville Site have potential safety risks from expansive soils, and liquefaction. Mitigation measures have been proposed within the FEIS to decrease these impacts to less-than-significant levels. None of the alternative locations contain the potential for landslides, subsidence, or high potential for lateral spreading.

Seismicity - Seismic events and related structural damage and resulting hazard to public safety would be considered a potentially significant impact, due to the location of the alternative sites within an area of seismic activity. Mitigation measures have been proposed within the FEIS to decrease impacts related to seismicity to less-than-significant levels.

Mineral Resources - None of the development alternatives would result in the loss of mineral resources, thus, this impact is less than significant.

3.1.2 Water Resources

Flooding - Alternatives A, H-sub-1, and H are located outside the 100-year floodplain, thus impacts would be less than significant.

Under Alternatives B, C, D, E, and F, less than half of the hardscape proposed would be located within the 100-year floodplain. Proposed design plans would elevate the buildings and structures five feet in elevation above the footprint of the 100-year floodplain. The parking areas would be at least one-foot above the floodplain. Mitigation measures related to flooding on these alternative sites appear in the FEIS to reduce any significant impacts.

Surface Water Quality/Construction Effects - Project construction under all alternatives would result in ground disturbance, increasing impervious surfaces through the conversion of undeveloped land into buildings and parking lots. Discharges of pollutants to surface waters from construction wastes, fuel spills, and leaks would be a potentially significant impact. Mitigation measures related to surface water quality are included within the FEIS to reduce these impacts to a less than significant level.

Surface Water Quality/Stormwater - Under all alternatives on-site stormwater runoff would be diverted into specific on-site detention systems that would be sized to accommodate excess

water draining from impervious surfaces. Since the detention basins would be developed as part of the project, the impact of stormwater runoff would be less than significant.

Wastewater – Under Alternatives A, H-sub1, and H, wastewater would either be conveyed to a local off-site WWTP or treated at an on-site WWTP. Under Alternatives B, C, D and F wastewater would be treated at an on-site WWTP. Compliance with all NPDES permit requirements would provide a less-than-significant impact to water quality from the discharge of tertiary treated wastewater. Nonetheless, mitigation measures have been included within the FEIS that would further reduce impacts from wastewater.

Alternatives B, C, D, E and F would not result in the development of a conveyance system to an off-site WWTP, therefore no significant impacts are anticipated. On-site wastewater treatment would occur as described for Alternatives A and H.

Under Alternative G, wastewater could potentially be generated from the development associated with the Northwest Specific Plan on the northeast portion of the Wilfred site. The City of Rohnert Park has access to sufficient unused capacity to serve the Northwest Specific Plan. Treated wastewater would be discharged under an existing NPDES permit held by the wastewater disposal system. Impacts from wastewater would be less than significant.

Groundwater - All development alternatives would increase the demand for groundwater, but would not significantly deplete supplies or degrade water quality in violation of ground water standards or threaten public safety. However, due to drawdown, significant and potentially significant impacts to well operation would occur at wells within the vicinity of the sites soon after pumping begins for the project. Mitigation measures contained in the FEIS would reduce these impacts to a less-than-significant level. An additional detailed monitoring and mitigation program would be implemented in order to clarify the impacts that actually result as well as provide appropriate mitigation.

3.1.3 Air Quality

Construction Emissions - All development alternatives would generate air pollutants through construction although they would not exceed regulatory emissions threshold levels. Reactive organic gases (ROG), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), particulate mater (PM)_{2.5},¹ and PM₁₀ construction emissions would result in a less-than-significant impact. Mitigation measures were included within the FEIS to further reduce potential construction emission impacts.

Operational Emissions - All development alternatives would result in operational emissions, primarily from traffic generated by the project. Mitigation has been incorporated to reduce traffic congestion, indoor air quality impacts, and odor impacts to a less than significant level. Impacts ROG, NO_x, PM_{2.5}, and PM₁₀ emissions from the project alternatives would be

¹ In the EIS PM_{2.5} emissions are estimated using PM₁₀ emissions as a surrogate, based on a CARB speciation profile for gasoline powered engines. In Attachment 7 of this ROD, a representative sample of actual PM_{2.5} emissions model results demonstrates that the surrogated emissions estimates are conservative in that they tend to overestimate emissions.

significant, yet with mitigation measures recommended within the FEIS, shall further decrease operational emissions to less than significant levels.

3.1.4 Biological Resources

Wildlife and Habitats - Development of all alternatives would result in habitat disturbances, including potential impacts to seasonal pools, wetlands, marshes, cultivated fields, and irrigated pastures. The development area proposed for Alternatives A, H-sub1, and H is less biologically sensitive when compared to the other alternatives, thus impacts to biological resources are lessened. For instance, although the development footprint for Alternative A (on the Wilfred Site) is similar to Alternative B (on the Stony Point Site), wetland impacts are reduced by approximately 90 percent. Alternative H is expected to have a slightly reduced footprint when compared with Alternatives A and G, resulting in further reductions in impacts to biological resources. Alternative H-sub1 footprint is similar to Alternative H, but has been arranged to further avoid impacts to sensitive biological areas. Specific disturbance characteristics are provided within the FEIS and ROD Attachment 3. Mitigation measures are presented within the FEIS to reduce site specific impacts to wildlife and habitat to less than significant levels.

Waters of the U.S - All alternatives would significantly affect jurisdictional Waters of the U.S through project grading or placement of on-site wastewater treatment options.

Alternative A would impact between 1.25 acres (Option 1), 2.08 acres (Option 2), and 2.37 acres (Option 3) of wetlands/drainages depending on the selected wastewater treatment option. Mitigation measures provided within the FEIS would reduce impacts to less-than-significant levels.

Alternative B would impact approximately 21.87 acres (Option 1) or 27.16 acres (Option 2) of wetlands/seasonal pools and drainages, depending on the selected wastewater treatment option. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Alternative C would impact approximately 22.28 acres (Option 1) or 26.28 acres (Option 2) of wetlands/seasonal pools and drainages, depending on the selected wastewater treatment option. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Alternative D would impact approximately 20.5 acres (Option 1) or 22.67 acres (Option 2) of wetlands/seasonal pools and drainages, depending on the selected wastewater treatment option. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Alternative E would impact approximately 20.41 acres (Option 1) or 21.69 acres (Option 2) of wetlands/seasonal pools and drainages, depending on the selected wastewater treatment option. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Alternative F would impact approximately 98.65 acres (Option 1) or 110.65 acres (Option 2) of wetlands/seasonal pools and drainages, depending on the selected wastewater treatment option. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Alternative H would impact approximately 1.14 acres (Option 1) or 1.97 acres (Option 2 or Option 3) of wetlands/seasonal pools and drainages, depending on the selected wastewater treatment option. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Alternative H-sub1 would impact approximately 0.91 acres of wetlands/seasonal pools and drainages. Similar to Alternative A, implementation of mitigation measures would reduce impacts to less than significant levels.

Under Alternative G, neither the Wilfred/Stony Point sites nor the Lakeville site would be developed, and the sites would remain in their current condition. Future development of either site would be guided by existing land use plans. Potential future development on the Wilfred Site would result in similar impacts to biological resources as those described under Alternative A. As discussed above, potentially significant impacts to biological resources would result from the development of the northeast corner of the Wilfred site.

Federally Listed Species - Two federally listed plant species, Sonoma sunshine and Burke's goldfields, have the potential to occur within the vicinity of the Wilfred and Stony Point Sites. No listed plants were found on the Wilfred or Stony Point Sites during a survey; nonetheless, mitigation has been included within the FEIS to ensure a less than significant effect. Alternative F would remove potential habitat for Callippe Silverspot and Myrtle's Silverspot Butterfly and California red-legged frog, creating a potentially significant impact. Mitigation has been included within the FEIS to ensure a less than significant effect. Implementation of Alternative A, B, C, D, E, G, H-sub1, and H would result in potential impacts to on-site California Tiger Salamander habitat. Mitigation listed in the EIS would reduce potential impacts to federally listed species to less than significant levels. In accordance with Section 7 of the Endangered Species Act (ESA), the NIGC has conducted formal consultation with the U.S. Fish and Wildlife Service (USFWS).

Migratory Birds - Under Alternatives B, C, D, E, and F migratory bird nests could be affected by vegetation removal associated with project construction during the nesting season, creating a potentially significant impact. Development on all alternative sites would result in the loss of a small amount of foraging habitat for raptor species, however, Alternatives A, G, H-sub1, and H site locations do not provide unique significant habitat features. Permanent features associated with proposed facilities under all development alternatives, such as night lighting, may potentially impact migratory bird species. Mitigation listed in the FEIS would reduce potential impacts to migratory bird foraging habitat and nesting locations to less than significant levels.

3.1.5 Cultural Resources

Cultural Resources - Alternatives B, D, and E (development on the northwest corner of the Stony Point Site) would require the excavation and removal of a potentially historic residence foundation and associated unknown artifacts. The other alternatives would have no effect on known cultural resources. Mitigation measures are presented within the FEIS to protect and preserve known resources. Additional mitigation measures are presented in the FEIS for the treatment of unanticipated discoveries.

Paleontological Resources - No paleontological or unique geological resources are known to exist in the local area of the alternative sites. Geologic formations that underlie the sites have a low probability of containing paleontological resources, and no impacts are expected. Mitigation measures are presented in the FEIS for the protection and preservation of unanticipated discoveries of paleontological resources.

3.1.6 Socioeconomic Conditions and Environmental Justice

Socioeconomics Conditions - Alternatives A, B, C, and F would result in the greatest economic stimulus to the region and would result in the greatest beneficial economic impact to the Tribe. All development alternatives would result in potential economic benefits for Sonoma County and the Tribe. Benefits to the County and surrounding municipalities would result from the creation of jobs and payments in-lieu of taxes agreed to in the various MOUs. The greatest economic benefit for the Tribe and the most jobs would be created by development alternatives with gaming. Within the City of Rohnert Park MOU, the Tribe has agreed to contribute annual funds to compensate problem gambling service programs. With this contribution and the implementation of mitigation measures within the FEIS, effects to problem gambling services would be less than significant. The non-gaming alternatives (Alternatives E and G) would not cause any of the social impacts potentially attributable to casinos (such as an increase in the incidence of problem/pathological gambling).

Environmental Justice - None of the development alternatives would result in significant disproportionate effects to low-income or minority populations. The purpose and need described in the FEIS is for the applicant Tribe to generate maximum net revenues to provide services for Tribal members who are members of a minority population and some of which are low income. Alternatives A, B, C, and F have similar higher amounts of net revenues compared to the other alternatives and thus would provide the greatest beneficial effect to the Tribe.

3.1.7 Resource Use Patterns

Transportation/Circulation - The alternatives that include development of the Wilfred or Stony Point Sites generally affect the same local traffic network, but the effects vary depending on the amount of traffic that the alternative is expected to draw, whether currently planned development on the Wilfred Site would be displaced and, to a lesser extent, the development's specific location on the Wilfred or Stony Point Sites. Alternatives A, B, and C are all similarly sized and would draw a similar amount of traffic to their developments through virtually the same road network. Alternative A, however, would take the place of development that would otherwise occur on the Wilfred Site. Thus, the traffic impact of

Alternative A is lower than Alternatives B and C (which would operate in addition to commercial/residential development planned for the Wilfred Site). Alternatives D and E would draw less traffic but would also not displace commercial/residential development at the Wilfred Site. As a result, Alternative D would have similar traffic impacts as Alternative A; Alternative E would have slightly lower traffic impacts than Alternative A. Alternative G (No Action) would include currently planned commercial/residential development on the Wilfred Site and would therefore have an impact over existing conditions but the impact would be lower than the other development alternatives which either propose more intensive development in place of the planned commercial/residential development (Alternative A) or propose development in addition to the planned commercial/residential development. Alternative H will be a reduced intensity alternative (similarly sized to Alternative D), but located on the Wilfred Site. Alternative H would draw a similar number of traffic trips to its developments as Alternative D, but would result in a lower traffic impact because it would displace planned Wilfred Site commercial/residential development, and not create unacceptable levels of service (LOS) along freeway segments and ramps. Specifically, traffic impacts would be slightly lower than Alternative E's impacts. Alternative H-sub1 traffic impacts would be in between those for Alternatives A and H. Alternative F is located at the Lakeville Site in southern Sonoma County along the Lakeville Highway. It would draw a similar number of traffic trips to the hotel/casino as Alternatives A thru C but with impacts primarily affecting intersections and road segments near the Lakeville Site.

All alternatives would add significant vehicle trips to the circulation network, resulting in decreased LOS for certain transportation facilities during the PM peak hours, mitigation measures have been proposed to ensure a less-than-significant impact. However, even with implementation of mitigation measures, significant impacts remain for intersections and freeway/ramp segments under Alternatives B, C, D, E, and F.

Land Use - Alternatives A, H-sub1, and H would result in development on a site that is largely undeveloped. However, the development portion of the Wilfred Site, a portion of which is within the Rohnert Park Sphere of Influence (SOI) area, is located within City's Northwest Specific Plan area, which calls for intensive development on the northeast portion of the Wilfred Site. Alternative A, H-sub1, and H would not create significant impacts to land use, as these developments would not result in any conflicts with surrounding land uses, such as denial of access or preclusion of allowable uses. Alternatives A and H would be located in an area designated as a "community separator" by local planning regulations, creating a loss of open space, however, funding is included within the MOU to contribute to an open space reserve.

Given the inferior quality of agricultural soils where development is proposed, the retention of the southern Williamson Act parcels for agricultural purposes, and the avoidance of land use conflicts with adjacent agricultural operations, Alternatives A, H-sub1, and H would have a less-than-significant impact on agriculture. Nonetheless, an additional mitigation measure has been added to Section 6.7 of this ROD requiring that the Tribe maintain the existing Williamson Act requirements in place as planned.

Alternative B, C, D, and E would result in development on a site that is largely undeveloped and not planned for development. These potential developments would not, however result in

any conflicts with surrounding land uses, such as denial of access or preclusion of allowable uses, and therefore would not create significant impacts to land use. All Stony Point Site alternatives would be located in an area designated as a “community separator” by local planning regulations, creating a loss of open space, however, funding is included within the MOU to contribute to an open space reserve. The impact on regional open space from Alternatives B, C, D, and E would be less than significant. Given the inferior quality of agricultural soils where development is proposed, the retention of the southern Williamson Act parcels for agricultural purposes, and the avoidance of land use conflicts with adjacent agricultural operations, Alternatives B, C, D, and E would have a less-than-significant impact on agriculture.

Current land uses and open space conditions would remain on the Wilfred, Stony Point, and Lakeville sites with implementation of Alternative G (No-Action Alternative). Without project implementation a commercial/industrial/residential development on approximately 66 acres in the northeast corner of the Wilfred site would continue as planned under the Northwest Specific Plan.

Alternative F would be inconsistent with several Sonoma County General Plan land use policies. Alternative F would not result in any land use conflicts, however, such as an obstruction of access or the preclusion of allowable uses. Therefore, a less-than-significant land use effect would result from Alternative F.

Under Alternative F, approximately 79 acres out of a total of 321 acres of the Lakeville Site would be developed. The remaining parcels in the Lakeville site would remain consistent with their current open space and agricultural use, resulting in a less-than-significant loss of open space and agriculture.

3.1.8 Public Services

All alternatives would increase the demand of services for solid waste, gas and electric, telecommunications, fire protection, law enforcement, EMS, court services, inspections and other services from State of California and local government agencies. Alternative A and the other development alternatives would likely have significant public health and safety impacts because they would increase the demand for the services to a level that exceeds the capacity of the existing systems. However, the impacts to public safety services would be reduced to less than significant levels with agreements to provide revenues to maintain capacity for public health and safety, which are recommended to achieve a less than significant impact in the FEIS.

3.1.9 Other Values

Noise - Under all alternatives, construction activities would be temporary in nature, typically occurring during normal daylight hours. The temporary nature of construction noise would result in a less-than-significant impact. Nonetheless, mitigation measures are identified in the FEIS that would result in reductions in construction noise impacts. On-site operational noise levels for all alternatives would exceed acceptable noise levels and result in a significant

impact to sensitive receptors, through on-site equipment or traffic noise. Mitigation measures are presented in the FEIS to reduce these noise impacts to less than significant levels.

Hazardous Materials - The alternatives are not located in areas with hazardous materials contamination. However, demolition of the two existing residential dwellings, built prior to 1960, would be necessary. Although the dwellings are not known to contain asbestos or lead based paint, dwellings built prior to 1978 are likely to contain asbestos containing materials (ACMs) and lead based paints. Demolition contractors are required by the National Emissions Standards for Air Pollutants (NESHAP) regulations to employ Best Management Practices (BMPs); thereby, reduce any potential risks to construction workers.

The potential for discovery of contamination during construction-related earth moving activities could occur. If this should happen, it could pose a risk to human health and/or the environment and be considered as a potentially significant impact. Mitigation measures are presented in the FEIS to reduce these impacts to a less than significant level.

It is likely that all development alternatives would include the use, generation, and storage of hazardous materials during the operation of the facilities. While the impacts would be similar to those of other light industrial operations of this size, there could be a potentially significant impact to the environment and public. Mitigation measures are presented in the FEIS to reduce these potential hazards to a less than significant level.

Visual Resources - Implementation of Alternatives A, H-sub1, and H on the Wilfred Site would visually be consistent with surrounding development activities and within an area planned for intensive development, hence visual impacts to land use planning, regional, and surrounding viewsheds under Alternatives A, H-sub1, and H would be less-than-significant.

The Stony Point alternatives are located in agricultural areas with designated open space. Alternative B, C, D, E propose construction that would be within a community separator and be visually inconsistent with surrounding uses. Therefore, a significant visual impact would occur. Since this impact cannot be mitigated, it would qualify as a significant and unavoidable impact. Alternative F would similarly be constructed in an area of non-urban uses causing a significant and unavoidable impact.

Light and glare from parking lots within all alternatives would be expected to trespass onto adjacent properties, resulting in a significant lighting impact. Mitigation is identified in the FEIS that reduces lighting and glare impacts to a less-than-significant level.

3.1.10 Indirect and Growth-Inducing Effects

Indirect Effects - The development alternatives would not result in significant indirect impacts. Indirect socioeconomic effects on the local and regional economy would result in beneficial effects to surrounding communities including the City of Rohnert Park and Sonoma County.

Indirect Effects from Off-Site Traffic Mitigation - With implementation of proposed mitigation measures, compliance with regulatory permits, and through the Tribe's MOUs there would be no significant indirect impacts from off-site traffic mitigation.

Growth Inducing Effects of Off-Site Pipeline Construction - Under Alternatives A and H, a wastewater pipeline may be constructed to connect the Wilfred Site to the Laguna WWTP (Option 1). If necessary, the construction of off-site pipelines would occur primarily along existing roadways and be temporary in nature. No significant indirect impacts would occur through infrastructure improvements. However, the Laguna WWTP may not have enough capacity, as the City of Rohnert Park's allocation is based on potential development with lower expected flows than Alternative A. This impact would be significant and therefore mitigation is provided in the FEIS to reduce impacts to a less-than-significant level.

3.1.11 Cumulative Effects

With the inclusion of mitigation measures in Section 5.0 of the FEIS, Alternatives A, G, H-sub1, or H, when added to past, present, and reasonably foreseeable future actions would not result in any significant cumulative impacts. Alternatives B, C, D, E, and F would result in significant impacts to traffic through unavoidable impacts to study intersections in the cumulative environment.

Impacts to biological resources under Alternative F, in the cumulative environment, would remain at a significant level due to potential disturbances to several special status species including Sonoma Sunshine, Myrtle's Siverspot, Callippe Silverspot, and California Red-Legged Frog.

With incorporation of mitigation measures included within the FEIS the remainder of the cumulative impacts would be considered less-than-significant.

Climate Change - Since the description of the affected environment in Section 3.4 and the analysis of climate change impacts in Section 4.12 of the FEIS, there have been some developments that are worth noting in this ROD.

- On July 23, 2009, USEPA published a rule which proposes to establish the criteria for including sources or sites in a Registry of Recoverable Waste Energy Sources (Registry), as required by the Energy Independence and Security Act of 2007. Waste energy can be used to produce clean electricity. The clean electricity produced by waste energy would reduce the need for non-renewable forms of electricity production, thus reducing greenhouse gas (GHG) emissions.
- On September 15, 2009, USEPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel economy for all new cars and trucks sold in the United States. USEPA proposed the first national GHG emissions standards under the Clean Air Act,

and NHTSA proposed an increase in the Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act.

- In response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), USEPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. Signed by the Administrator on September 22, 2009, the rule requires that suppliers of fossil fuels and industrial GHGs, manufacturers of vehicles and engines outside of the light duty sector, and facilities that emit 25,000 metric tons or more of GHGs per year to submit annual reports to USEPA. The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change.
- On September 30, 2009, USEPA proposed new thresholds for greenhouse gas emissions (GHG) that define when Clean Air Act permits under the New Source Review and title V operating permits programs would be required.
- On June 30, 2009, the USEPA granted a Clean Air Act waiver, which the State of California needs in order to implement AB 1493.
- In early December 2008 the California Air Resources Board (CARB) released its scoping plan to the public, which was approved by CARB on December 12, 2008. The scoping plan calls for the reduction of GHG emissions to 1990 levels, which equates to cutting approximately 30 percent of emissions estimated for 2020, or about 15 percent from today's levels. The scoping plan relies on existing technologies and improving energy efficiency to achieve the 30 percent reduction in GHG emission levels by 2020.
- Signed by the governor on August 24, 2007, SB 97 requires that the Governor's Office of Planning and Research (OPR) prepare California Environmental Quality Act (CEQA) guidelines for evaluating the effects of GHG emissions and for mitigating such effects. The Natural Resources Agency adopted these guidelines in December 2009.
- On December 15, 2009, the USEPA issued a finding that the changes in the climate caused by GHG emissions endanger the public health and welfare (74 Fed. Reg. 66496).

Finally, on February 18, 2010, the CEQ issued a memorandum entitled "Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions." The memo contains draft guidance on considering the effects of climate change and GHG emissions in NEPA documents. The CEQ has circulated the draft guidance for public comment and specifically notes in the memo that it "does not intend this guidance to become effective until its issuance in final form." Nonetheless, considering the pending issuance of this ROD, the NIGC has reviewed the draft guidance and considered its suggestions carefully.

The memo suggests that agencies should both qualitatively and quantitatively assess GHG emissions impacts if direct project emissions are greater than 25,000 metric tons of carbon dioxide equivalent (CO₂e) emissions. Direct emissions from Alternatives A - H (including H-sub1) range from 389 to 1,394 metric tons of CO₂e per year. Nonetheless, the NIGC conducted a full quantitative and qualitative assessment of impacts. Furthermore, the assessment of impacts is consistent with the assessment methodology outlined in the draft CEQ guidance. For instance, the CEQ recommends that the environmental document reflect the global context of the climate change issue, which the FEIS does, including the analysis of climate change in the cumulative section of the EIS for this reason. Also, the CEQ draft guidance recommends setting reasonable spatial and temporal boundaries for the assessment, which the FEIS does, analyzing impacts within the cumulative time period identified in the FEIS and within the context of the State of California's efforts to reduce future emissions. The CEQ draft guidance recommends discussing measures to reduce GHG emissions, including the consideration of reasonable alternatives. The FEIS includes the analysis of multiple alternatives resulting in varying levels of GHG emissions. The FEIS also includes numerous climate change related mitigation measures. The CEQ draft guidance notes that the analysis should not try to link project emissions to specific climate changes or environmental impacts, "as such direct linkage is difficult to isolate and to understand." The FEIS acknowledges this fact and does not attempt to provide such links.

3.1.12 Unavoidable Adverse Effects

Cumulative transportation impacts to Alternative B, C, D, E, and F would continue to be significant after the implementation of mitigation measures included within the FEIS. Significant impacts would occur at two study intersections under Alternative B, one study intersection under Alternative C, one study intersection under Alternative D, one study intersection under Alternative E, and two study freeway/ramp segments under Alternative F.

Alternative F would create an adverse environmental justice impact to minority/low income communities of neighboring Solano County through a significant and unavoidable increase in traffic at two freeway/ramp segments within Solano County.

Cumulative impacts to biological resources at the Lakeville Site (Alternative F) would continue to be significant after the implementation of mitigation measures in the FEIS.

Visual impacts under Alternatives B, C, D, E, and F would continue to be significant after the implementation of mitigation measures provided in the FEIS.

3.2 RESPONSES TO COMMENTS ON THE FINAL EIS

Several public comments on the FEIS were received during the 30-day waiting period following release of the FEIS. Responses to the comments provide additional analysis or indicate specifically where the relevant information requested can be found in the FEIS. The comments and responses are contained in Attachment 5 to this ROD.

4.0 PREFERRED ALTERNATIVE

For the reasons discussed in FEIS Section 2.11, the NIGC chose originally Alternative A, with wastewater disposal Option 3 as the agency's Preferred Alternative. However, after considering input received during the FEIS waiting period by the United States Environmental Protection Agency (USEPA) and Sonoma County and after consultation with the Tribe, the NIGC has decided to choose as its Preferred Alternative a variant that is in between Alternatives A and H (a reduced intensity alternative) in the size and components of the proposed facilities (Variant H-sub1). For the reasons discussed in FEIS Section 2.11, the NIGC selects on-site wastewater treatment and seasonal storage/sprayfield disposal (see ROD Attachment 3 for more detail) for its Variant H-sub1 Preferred Alternative. Variant H-sub1 meets the purpose and need better than Alternative H while providing a lesser impact on the environment than Alternative A. Also, as with Alternative A (see FEIS Section 2.11), mitigation measures for Variant H-sub1 would ensure that post-mitigation impacts are similar to Alternative H. Thus, Variant H-sub1 is judged by the NIGC to best meet the purpose and need while minimizing impacts on the human environment and now constitutes the NIGC's Preferred Alternative.

The Preferred Alternative is expected to provide a stable source of net income for the Tribe that will allow it to begin to address the substantial and serious needs of its members and pursue its goal, of economic development, self-sufficiency, self-determination and strong Tribal government without resulting in substantial significant negative impacts on the surrounding environment and community. Because of these substantial benefits to the Tribe and its members, NIGC finds that gaming on the Wilfred Site, and in particular Variant H-sub1, is in the best interests of the Tribe.

5.0 ENVIRONMENTALLY PREFERRED ALTERNATIVES

Either the No-Action Alternative or Alternative H would result in the fewest effects to the biological and physical environment. Alternative H would involve a smaller facility and environmental footprint than any of the other casino alternatives and is located on the Wilfred Site, which is less environmentally sensitive than the Stony Point and Lakeville Sites. Because NIGC cannot predict with certainty the exact type of development that would occur under the No-Action Alternative, it is difficult to assess whether it would result in similar, lesser, or greater impacts to the biological and physical environment than the Alternative H. However, immediately to the east of the proposed facility, there currently exists a major retail center with a Home Depot and a Walmart. However, assuming development at a level consistent with the Northwest Specific Plan (See FEIS Section 2.8.1), the environmental impacts of the No Action Alternative would be similar to Alternative H.

The No-Action Alternative would not meet the purpose and need of the Proposed Action. Specifically, it would not provide any source of net income to allow the Tribe to achieve self-sufficiency, self-determination, or strong Tribal government. Thus, it was not chosen as the preferred alternative.

Alternative H would likely result in lesser economic benefits for present and future Tribal members than the other casino alternatives, including Alternative A. However, Alternative H would help meet the purpose and need better than the No-Action Alternative. As noted above

in Section 4.0, Variant H-sub1 would have similar environmental impacts as Alternative H after mitigation, with a reduced impact to wetland features, as well as better meeting the purpose and need. Variant H-sub1 was therefore chosen as the Preferred Alternative.

6.0 MITIGATION MEASURES

All practicable means to avoid or minimize environmental harm from the Preferred Alternative (Variant H-sub1 with wastewater disposal Option 3) have been identified and adopted. The following mitigation measures and related enforcement and monitoring programs have been adopted as a part of this decision. Where applicable, mitigation measures will be monitored and enforced pursuant to federal law, tribal ordinances, and agreements between the Tribe and appropriate governmental authorities as well as this decision. By implementing these mitigation measures, it is reasonably expected that the Preferred Alternative would not result in any significant adverse impacts to the surrounding community or the environment. Specific best management practices and mitigation measures adopted pursuant to this decision are set forth below:

6.1 GEOLOGY AND SOILS

- A. The following mitigation measures shall be implemented to result in a less than significant impact to the development from expansive soils:
 - a. For structures with a light to moderate bearing load (one to three stories), a shallow, spread footing foundation system would be sufficient to provide support under expansive soil conditions (see FEIS Appendix K for more details and optional systems). However, a shallow foundation system shall be designed to reduce the potential for seasonal moisture variation under the buildings by providing continuous perimeter strip footings that extend below the depth of seasonal moisture variation (typically 18 inches or deeper).
 - b. For structures with a high bearing load, either a post-tensioned concrete slab, or heavily reinforced structural mat slab (shallow foundation systems), or a deep foundation system such as a drilled piers would be necessary to provide support under expansive soil conditions (see FEIS Appendix K for more detail). Shallow system designs applied to high bearing load structures will also be designed to reduce the potential for seasonal moisture variation.
 - c. To mitigate impacts to pavement caused by expansive soil, one or a combination of the following measures shall be required:
 - i. Removal and replacement with non-expansive soils.
 - ii. Lime treatment of soils.
 - iii. Design of pavement sections to withstand potential swelling pressures.
- B. All structures shall be designed in compliance with the California Building Code (CBC) Building Code (Article VI Chapter 6.04) current at the start of construction such that risks to the health or safety of workers or members of the public from earthquake hazards are reduced to a less-than-significant level.

6.2 WATER RESOURCES

Surface Water

Construction Impacts

- A. During construction, surface water quality shall be protected by using BMPs as listed in the Erosion Control recommendations found in FEIS Appendix C. These BMPs would be included in the Stormwater Pollution Prevention Plan (SWPPP) to be filed with the USEPA).
- B. A stormwater sampling and monitoring program shall be developed and implemented to assess the quality of surface water entering and leaving development sites. At a minimum, sampling sites shall include: a location upstream at an elevation above all proposed development; and a location downstream of all development, yet at an interception point prior to surface waters entering the Laguna de Santa Rosa. Analyses shall include total suspended solids (TSS), oils and grease.

Operational Impacts

- C. Application of fertilizer shall be limited to the minimum amount necessary and shall be adjusted for the nutrient levels in the water used for irrigation. Fertilizer shall not be applied immediately prior to anticipated rain.
- D. The garbage bin area shall be covered. Any runoff or drainage from the garbage bin area shall be directed to the sewer system and treated by the WWTP.
- E. Landscape irrigation shall be adjusted based on weather conditions and shall be reduced or eliminated during the wet portion of the year in order to prevent excessive runoff.

Wastewater

- F. In order to maintain the water balance described in Section 4.3.1 of the FEIS, a minimum of 50 gallon per minute (gpm) of treated wastewater shall be designated for use by the casino and hotel.
- G. The WWTP shall be staffed with operators who are qualified to operate the plant safely, effectively, and in compliance with all permit requirements and regulations. The operators shall have qualifications similar to those required by the State Water Resources Control Board Operator Certification Program for municipal wastewater treatment plants. This program specifies that for tertiary level wastewater treatment plants with design capacities of 1.0 million gallons per day (MGD) or less, the chief plant operator must be a Grade III operator. Supervisors and Shift Supervisors must be Grade II operators. An Operations and Maintenance Program must be followed by the plant operators. Emergency preparedness shall include all appropriate measures, including a high level of redundancy in the major systems.

Regional Groundwater

- H. Existing on-site wells shall be abandoned and sealed. On the Wilfred Site, two wells shall be abandoned and capped.
- I. In order to offset the groundwater used by implementation of the project, the Tribe shall implement one or more of the following measures:
 - a. The Tribe shall work with the City of Rohnert Park and Sonoma County Water Agency (SCWA) to allocate and deliver more surface water, aiding in the City's compliance with the City's settlement with the South County Resource Preservation Committee.
 - b. The Tribe may work with and compensate the City and/or SCWA to implement a water conservation program and/or a conjunctive water use program. The program shall (1) assess existing and potential sources of reclaimed wastewater within SCWA's service area, and determine potential points of use for the reclaimed wastewater, and/or (2) supplement the City's and/or SCWA's existing water conservation programs to identify and implement additional conservation measures within City and/or SCWA service areas. The program(s) shall incorporate reclaimed water use and/or conservation to an extent that would completely offset groundwater pumping associated with the selected project Alternative.
 - c. The Tribe shall participate in the creation of or create an off-site artificial recharge project, such as purchasing a groundwater well in the sub-basin and retiring the well from service in order to offset a portion of the groundwater used by implementation of the project (in lieu recharge).
- J. The Tribe shall cooperate with the conduct of the ongoing Joint USGS/SCWA Study of the Santa Rosa Plain Groundwater Sub-basin by providing its Groundwater Study and any aquifer testing and monitoring data compiled during the EIS mitigation phase. In addition, the Tribe shall join other stakeholders in participating in the *Cooperative Agreement to Provide Funding and Support Information for Santa Rosa Plain Groundwater Study* for Years 4 and 5 of the study and future supplemental studies, subject to the agreement of the other stakeholders in the Tribe's participation. If added to the agreement, the Tribe shall provide funding of an equitable share that is proportionate with other participating non-tribal stakeholders, and that considers its fraction of the municipal groundwater demand in the Santa Rosa Plain Groundwater Basin (currently about 1.8%). In addition, the Tribe shall participate in the identification and implementation of reasonable measures or action plans developed through the study, in the same manner as participating non-tribal stakeholders, and in proportion to its contribution to any basin decline identified by the study.

- K. As part of the Tribe's MOU with the City of Rohnert Park, the Tribe will contribute to help establish or support ongoing water conservation measures city-wide in Rohnert Park.
- L. Water conservation measures including use of reclaimed water for landscape watering, cooling tower makeup water, and toilets shall be implemented. In addition, the following water conservation measures shall be adopted (resulting in a water savings of approximately 12,800 gallons per day for the full size casino/hotel alternatives):
- a. Check steam traps and ensuring return of steam condensate to boiler for reuse.
 - b. Limit boiler blowdown and adjusting for optimal water usage.
 - c. Use low flow faucets and/or aerators in casino and hotel.
 - d. Use low flow showerheads in hotel.
 - e. Encourage voluntary towel re-use by hotel guests.
 - f. Use pressure washers and water brooms instead of hoses for cleaning.
 - g. Use garbage disposal on-demand in restaurant.
 - h. Incorporate a re-circulating cooling loop for water cooled refrigeration and ice machines in restaurants.
 - i. Serve water to customers only upon request at restaurants.
 - j. Use air-cooled units in central plant.
 - k. Use low volume spray rinse valve for pre-cleaning dishes.
 - l. Use low volume dishwasher.
 - m. Operate dishwashers with full loads only.
 - n. Use high pressure/low flow spray rinsers with automatic shut off for pot washing.
 - o. Reuse dishwasher wastewater for low-grade purposes such as pre-washing and garbage disposals.
 - p. Use self-contained (connectionless) vegetable steamers.
 - q. Reduce flow to minimum necessary in scrapper troughs, wash down, and frozen food thawing.

- r. Use air-cooled ice machines.

Localized Groundwater

- M. The Tribe shall implement a groundwater monitoring program preceded by a pump test (see FEIS Appendix G for a detailed description of the recommended pump test and monitoring program) as soon as feasible after project approval and preferably at least one year before opening of the project facilities to the public (to allow for baseline monitoring). The pump test shall include at least one shallow monitoring well located in close proximity to the Laguna de Santa Rosa in order to verify that pumping associated with the Preferred Alternative will not affect the Laguna de Santa Rosa.
- N. The Tribe shall implement a program to compensate neighboring well owners for impacts to well operation based on interference drawdown caused by project pumping. The actual amount of interference drawdown associated with the project shall be estimated from the proposed pumping test and groundwater level monitoring program (see above and FEIS Appendix G). At least one year of baseline data and one year of data after project pumping begins should be collected prior to implementation of the following well impact compensation program:
 - a. Well Usability (Impacts 1 and 2) – The tribe shall reimburse the owners of wells that become unusable within three years of the onset of project pumping for a portion of the prevailing, customary cost for well replacement, rehabilitation or deepening. The mitigation method for which reimbursement is made shall be the lowest-cost customary and reasonable method to restore the lost well capacity. The percentage of the cost reimbursed by the tribe shall depend upon the degree to which the impact is caused by project pumping vs. pumping by other wells. Reimbursement shall be for replacement in-kind; that is, for a well of similar construction, but deepened so as to restore the lost well capacity. A depreciation allowance shall be subtracted from the reimbursement amount for wells or pumps that have condition issues. In order to be eligible, the well owner must provide the Tribe with documentation of the well location and construction (diameter, depth, screened interval, pump type, etc.), and that the well was constructed and usable before project pumping was initiated.
 - b. Diminished groundwater level near or below pump intake (Impact 3) – The Tribe shall reimburse the owners of wells with pumps that require lowering within three years of the onset of project pumping for a portion of the prevailing, customary cost for this service. The percentage of the cost reimbursed by the Tribe shall take into consideration the degree to which the impact is caused by project pumping vs. pumping by other wells, and the degree to which a well's capacity may have been reduced in the absence of project pumping due to shallow placement of the pump intake. Replacement discharge piping shall not be reimbursed, and replacement of

pumps shall not be reimbursed unless the pump was damaged due to project-related interference drawdown. In order to be eligible, the well owner must provide the Tribe with documentation of the well location and construction, including pump intake depth, and that the well was constructed and usable before project pumping was initiated. The Tribe must be made aware of the cost reimbursement claim prior to lowering of the pump intake, so that the need for possible well deepening, replacement or rehabilitation can be assessed. At the Tribe's discretion, compensation may be paid toward well deepening, replacement, or rehabilitation in lieu of toward lowering the pump intake.

- c. Increased Electrical and Maintenance Cost (Impact 4) – The Tribe shall reimburse well owners pumping more than 100 acre-feet/year for their additional annual electrical costs at the prevailing electrical rate based on the following formula:

$$\text{KWhr/year} = \frac{(\text{gallons Pumped/year}) \times (\text{feet of interference drawdown})}{1,621,629}$$

In order to qualify for reimbursement, the well owner must provide proof of the actual annual volume of water pumped and/or the electrical usage associated with the pumping. As an alternative to annual payments, a one-time lump sum payment of a mutually agreeable amount could be made.

- d. No reimbursement would be made available for wells installed after operation of the project wells commences.
 - e. For any of the above impacts, the Tribe may choose at its discretion to provide the well owner with a connection to a local public or private water supply system in lieu of the above mitigation measures, at reduced cost in proportion to the extent the impact was caused by project pumping.
 - f. The known owners of identified wells within two miles of the project pumping well(s) shall be notified of the well impact compensation program outlined above before project pumping begins.
 - g. We recommend that the Tribe contract with a third party, such as Sonoma County, to oversee this well impact compensation program.
- O. The proposed storm water detention basin shall retain a portion of the storm water runoff, where it will percolate into the ground, if possible without compromising primary stormwater flow control objectives.

6.3 AIR QUALITY

Construction Impacts

- A. The generation of construction-related PM₁₀ and PM_{2.5} emissions would cause a less-than-significant impact. However, Basic Control Measures and Enhanced

Control Measures from Table 2 of the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines - Assessing the Air Quality Impacts of Projects and Plans are recommended as mitigation during construction.

- a. The Tribe shall designate an on-site Air Quality Construction Mitigation Manager (AQCMM) who shall be responsible for directing compliance with mitigation measures for the construction project.
 - b. Basic Control Measures shall include the following:
 - i. Water all active construction areas at least twice daily.
 - ii. Cover all truckloads hauling soil, sand, and other loose materials or require all truckloads to maintain at least two feet of freeboard.
 - iii. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers to all unpaved access roads, parking areas and staging areas at construction sites.
 - iv. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
 - v. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
 - c. Enhanced Control Measures shall include the following:
 - i. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
 - ii. Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
 - iii. Limit traffic speeds on unpaved roads to 15 mph.
 - iv. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
 - v. Replant vegetation in disturbed areas as quickly as possible.
 - vi. Use of construction entrances to reduce soil/dust transport off-site.
 - vii. Time-staged construction shall be used to avoid dust/open soils.
- B. The generation of ROG, NO_x, PM₁₀, and diesel particulate matter emissions from construction equipment would cause a less-than-significant impact. However, implementation of the following basic measures are recommended during construction in order to further reduce the effects from construction activities:
- a. To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies
 - b. All diesel-fueled engines used in construction shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel.
 - c. All construction diesel engines, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-

ignition engines, unless certified by the AQCM that such an engine is not available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 (or newer) engines will be used preferentially. Older engines will only be used if the AQCM certifies that compliance is not feasible.

- d. All diesel fueled engines used in construction shall have clearly visible tags or other suitable means of identification showing that engine meets the above requirements
- e. Idle time shall be minimized to five minutes when the equipment is not in use, unless safety requirements or manufacturers specifications indicate that more time is required.
- f. Heavy duty diesel equipment shall be maintained in optimum running condition.

Operational Impacts

- C. In coordination with the regional transportation agency, such as the Sonoma County Transit, the Golden Gate Transit, and the potential Sonoma Marin Area Rail Transit (SMART) rail, the Tribe shall provide the following to support regularly-scheduled community transit or shuttle service to and from the nearest mutually-acceptable major transit node:
 - a. Transit shelter benches,
 - b. Street lighting,
 - c. Route signs and display, and
 - d. Bus turnouts.
- D. The Tribe shall implement feasible travel demand management (TDM) measures for a project of this type. These measures shall include, but are not limited to:
 - a. Designation of an on-site TDM coordinator.
 - b. Provisions to encourage bicycle commuting. Bicycle lanes and parking areas will be provided wherever appropriate and feasible.
 - c. Provision of transit use incentives, provision of information, printed schedules and commuter promotions.
 - d. Carpool incentives, such as monetary or other rewards will be made available to employees.
 - e. Installation of secure bicycle parking facilities at commercial areas.
- E. Buses and other commercial diesel-fueled vehicles shall comply with the California Air Resource Board's (CARB) Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (California Code of Regulations, Title 13, Division 3, Article 1, Chapter 10, Section 2485), which requires that the driver of any diesel bus shall not idle for more than five minutes at any location, except in the case of passenger boarding where a ten minute limit

is imposed, or when passengers are onboard. Furthermore, the Tribe shall provide a “Drivers Lounge” for bus and truck drivers to discourage idling.

- F. Where feasible, the Tribe shall use alternative fuels for casino vehicles.
- G. The Tribe shall encourage and facilitate the use of ‘carpools’ for construction workers and facility employees; tour buses for casino patrons to reduce vehicular use and air pollution.
- H. The Tribe shall maintain all vehicles to manufacturer’s specifications.
- I. The Tribe shall ensure that buildings are oriented to take advantage of solar heating and natural cooling, and use passive solar designs.
- J. The Tribe shall ensure use of solar, low-emission, central, or tankless water heaters and install wall insulation that shall exceed Title 24 requirements.
- K. If mechanical ventilation is included in the parking structure design, the exhaust shall be vented in a direction away from inhabited areas. Directing the exhaust away from inhabited areas would reduce the impacts of parking structure-generated CO to a less-than-significant level.
- L. The Tribe shall ensure that all shift changes occur during non-peak hours.
- M. A minimum of 20 percent of landscape maintenance equipment used by the Tribe shall be electric and outlets shall be provided on the exterior of all buildings for this use.
- N. A final Conformity Determination has been issued (see FEIS Appendix W) based upon evidence of conformance with the State Implementation Plan (SIP) for NO_x and CO through the purchase of 149 tons of NO_x Emission Reduction Credits (ERCs). The ERCs will be purchased in the BAAQMD pursuant to an enforceable contract to purchase the ERCs before the start of construction (see FEIS Appendix W, Addendum 1).
- O. Regional air quality impacts would be reduced, but not to a level that is less than significant for ROG, NO_x, or PM₁₀ with the addition of Mitigation Measures 6.3A-M. However, with the implementation of Mitigation Measures 6.3N, NO_x impacts are less than significant. With the implementation of Mitigation Measures 6.3P, ROG and PM₁₀ impacts would be less than significant, assuming Mitigation Measure P is cost and technologically feasible and appropriate mitigation programs are available within the air basin (see **Table 1**). If Mitigation Measure P is not implemented; then a significant and unavoidable impact to air quality would remain.
- P. One or more of the following measures will be implemented to reduce ROG and PM₁₀ emissions to less than 15 tons per year and PM_{2.5} to less than 100 tons per year.
 - a. Pave or resurface unpaved roadway(s) or roadway(s) in a deteriorated state within the San Francisco Bay Area Air Basin, which have a minimum daily vehicle count of 100 vehicles.

- b. Contribute to a program to retrofit residential fireplaces that do not meet USEPA certification standards within the San Francisco Bay Area Air Basin.
- c. Purchase low emission buses to replace older municipal or school buses used within the San Francisco Bay Area Air Basin.
- d. Purchase hybrid vehicles to replace existing governmental fleet vehicles within the San Francisco Bay Area Air Basin.
- e. Purchase and install on-site or within the San Francisco Bay Area Air Basin; a photovoltaic array, wind powered energy, and/or other form(s) of renewable energy.
- f. Contribute a fair share percentage to the synchronization of traffic signals within the San Francisco Bay Area Air Basin.
- g. Purchase Emission Reduction Credits if available from sources within the San Francisco Bay Area Air Basin.

TABLE 1
MITIGATED OPERATION EMISSIONS – VARIANT H-SUB 1

Sources	ROG	NOx	PM ₁₀	PM _{2.5} ¹
	tpy	tpy	tpy	tpy
Mitigated Emissions (all mitigation except 5.2.3 P)	72.38	123.07	139.61	138.49
Reduction from Mitigation Measure 5.2.3 P	57.38	123.07	124.61	38.49
Final Mitigated Emissions	15	0	15	100
Significant Effect?	No	No	No	No

Note: tpy = tons per year. N/A = Not Applicable

¹ CARB speciation profile shows that 99.2% of PM₁₀ is PM_{2.5} for gasoline powered engine emissions and 92.0% for diesel powered engine emissions. 99.2% is assumed here for a conservative analysis. See Attachment 7 to this ROD for a technical memorandum demonstrating the conservative nature of this assumption.

Source: URBEMIS, 2007.

Odor Impacts

- Q. The WWTP shall be constructed with comprehensive odor control facilities, including the injection of odor control oxidants at the sewage lift station and construction of a covered headworks with odor scrubber at the WWTP.
- R. Spray drift from the WWTP or spray disposal field shall be monitored daily during operation by qualified personnel. Spray drift from these two sources shall not be allowed to migrate out of the plant's property boundaries. In the event that spray drift emanating from sprayfield does migrate outside of the property boundaries, operational measures shall be taken to eliminate offsite drift of spray.
- S. Spray field irrigation will cease when winds exceed 30 mph.

Toxic Air Contaminants

- T. Proposed commercial land uses (e.g., loading docks) that have the potential to emit toxic air emissions shall be located as far away as feasibly possible from existing and proposed sensitive receptors in accordance with CARB's Air Quality and Land Use Handbook. In addition, loading docks will provide refrigeration trucks with electrical outlets. Truck using the loading docks shall not idle for more than five minutes.
- U. Air intakes associated with the heating and cooling system for buildings shall not be located next to potential TAC-emitting locations (e.g., loading docks) in accordance with CARB's Air Quality and Land Use Handbook.

Indoor Air Quality

- V. The Tribe shall ensure that ventilation of outdoor air is consistent with American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Standard 62-1999² under all operating conditions.
- W. To limit public exposure to environmental tobacco smoke, the Tribe shall provide non-smoking areas, or "smoke-free zones" in the casino gaming area.
- X. The Tribe shall provide non-smoking rooms in the hotel.
- Y. The Tribe shall ensure that comfort levels are acceptable to most occupants, and be consistent with ASHRAE Standard 55-1992³, under all operating conditions.
- Z. Signage shall be prominently displayed alerting patrons and employees of areas that permit smoking, noting that environmental tobacco smoke has been found to be deleterious to health, and noting the availability of a brochure(s) describing the health effects of exposure environmental tobacco smoke.
- AA. A brochure(s) describing the health effects of exposure to environmental tobacco smoke shall be made available to casino patrons in common areas that permit smoking.
- BB. Prospective employees shall be informed, prior to their hire, that indoor smoking is permitted in portions of the buildings where they may be employed.
- CC. Prospective employees shall be given a brochure(s) describing the health effects of exposure to environmental tobacco smoke.

² ASHRAE Standard 62-1999, *Ventilation for Acceptable Indoor Air Quality*, is the generally accepted standard for commercial buildings in the United States.

³ ASHRAE Standard 55-1992, *Thermal Environmental Conditions for Human Occupancy*, identifies many factors that influence thermal comfort and the perception of thermal conditions. Among them are temperature, radiation, humidity, air movement, vertical, and horizontal temperature differences, temperature drift, personal activity, and clothing.

- DD. The Tribe shall ensure that significant expected sources of pollutant emissions are isolated from occupants using physical barriers, exhausts, and pressure controls.
- EE. The Tribe shall ensure that outdoor air entering the building is protected from contamination from local outdoor sources and from building exhausts and sanitation vents.
- FF. The Tribe shall ensure that provisions are made for easy access to heating, ventilation, and air conditioning (HVAC) equipment requiring periodic maintenance.
- GG. The Tribe shall ensure that occupant exposure to construction contaminants is minimized using protocols for material selection, preventive installation procedures, and special ventilation and pressure control isolation techniques.
- HH. The Tribe shall ensure the use of low-emitting building products pursuant to Integrated Waste Management Board's Section 01350 where feasible.

Climate Change

As noted in **Table 2**, a less than significant cumulative impact to global climate change would result after the implementation of Air Quality Mitigation Measures E. In addition, the implementation of the following mitigation measures is recommended, subject to the discretion of the Tribe, to further reduce project climate change impacts.

TABLE 2
Preferred Alternative Compliance with State emissions reduction strategies

Exec Order S-3-05 / AB 32 Strategy	Project Design / Mitigation Measure Compliance
Diesel Anti-Idling: In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling.	Project would be in compliance after implementation of Air Quality Mitigation Measure E.
Achieve 50 percent statewide Recycling Goal: Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	Project would be in compliance as discussed in FEIS Section 4.12.
Water Use Efficiency: Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions	Project would be in compliance as discussed in FEIS Section 4.12.

SOURCE: State of California, Environmental Protection Agency, and Climate Action Team, 2006

- II. The Tribe shall ensure the use of low-emitting building products pursuant to Integrated Waste Management Board's Section 01350 where feasible.
- JJ. The Tribe shall plant trees and vegetation on-site or fund such plantings off-site. The addition of photosynthesizing plants would reduce atmospheric CO₂, because

plants use CO₂ for elemental carbon and energy production. Trees planted near buildings would result in additional benefits by providing shade to the building; thus reducing heat absorption, reducing air conditioning needs and saving energy.

- KK. The Tribe shall ensure use of solar, low-emission, central, or tankless water heaters and install wall insulation that shall exceed Title 24 requirements.
- LL. The Tribe Shall use energy efficient appliances in the hotel and casino.
- MM. Environmentally preferable materials shall be used to the extent practical for construction of facilities.
- NN. The Tribe shall install a photovoltaic cell array(s) on the roof of the proposed parking garage and/or the roof(s) of other on-site structures, if feasible. The installation of photovoltaic (PV) on-site would reduce dependence on Pacific Gas and Electric (PG&E) electricity. PV cells convert energy from the sun into electrical energy with no emission of green house gases (GHGs); thus, the indirect GHG emissions would be reduced.
- OO. The Tribe shall enroll in the ClimateSmart program that is offered to PG&E customs to reduce their indirect GHG emissions form electrical generation to zero. PG&E provides electricity uses with the opportunity to become “carbon neutral” under the ClimateSmart program.
- PP. The Tribe shall purchase CO₂e offsets to reduce or eliminate GHG impacts, where feasible.
- QQ. The Tribe shall increase the recycling goal noted in Mitigation Measure 5.2.8d from 25 to 50 percent.

6.4 BIOLOGICAL RESOURCES

- A. For impacts to wetlands or other waters of the U.S., authorization from the USACE is required. Replacement of directly affected wetlands will be at a ratio approved by the USACE. Clean Water Act Section 401 water quality certification will also be required from the USEPA.
- B. Wetland mitigation shall be accomplished through creation/restoration of seasonal wetlands onsite and/or within an open space preserve. This creation/restoration will provide an increase in the inventory of seasonal wetlands for the area. The proposed 1.5:1 ratio of seasonal wetland restoration/creation to impacted acreage is expected to be sufficient to satisfy the ratio of replacement to impacted acreage required by regulatory agencies based on wetland functions and values present on the Wilfred Site. A detailed mitigation plan shall be designed that includes monitoring and reporting requirements, responsibilities, performance success criteria, reporting procedures and contingency requirements.

- C. A plan shall be developed and implemented to conserve ecological resources in the southern portion of the Wilfred Site. The plan shall address management activities to ensure maintenance of breeding, refugial, and dispersal habitats for California tiger salamander (CTS); and should provide a grazing regimen that will conserve populations of Sonoma sunshine and Burke's goldfields. The current mitigation ratios for listed plants species on the Santa Rosa Plain as required in the Programmatic Biological Opinion are based on the presence of suitable versus occupied habitat, and the potential for presence of Burke's goldfields and Sonoma sunshine; or Sebastopol meadowfoam. The site is considered to be occupied if surveys conducted using the USFWS protocol determined presence of the plants, or if the site had listed plants in the past. Protocol botanical inventories for federal listed plants on the Santa Rosa Plain consist of a minimum of three site visits per year and a minimum of two years of negative survey data within three years of project proposal submission to substantiate a negative finding. Under the Programmatic Biological Opinion, seasonal wetlands such as those present on the Wilfred Site and that are within the range of the three listed plants species are considered suitable habitat for the listed plants even if intensive surveys fail to locate their presence. This provision is necessary because seed banks are often persistent; some plant species may not produce seedlings for many years until conditions are appropriate.

The mitigation requirements for the Preferred Alternative are shown in **Table 3**

TABLE 3

Preferred Alternative Mitigation Requirement for Impacts to Listed Plant Species of the Santa Rosa Plain

	Acres
Seasonal Wetland Impacts	0.55
Mitigation – Occupied/Established Habitat	0.55
Mitigation – Established Habitat	0.275
Total Mitigation Requirement	0.775

Source: AES, 2009

- D. Development impacts on CTS aestivation habitat on the Wilfred Site have been evaluated in a USFWS Biological Opinion, issued on February 3, 2009. This approved BO requires mitigation for CTS aestivation habitat at a ratio of 1:1 within 1.3 miles of a known breeding site and 3:1 for projects that are within 500 feet of an adult occurrence.

With impacts to 81.13 acres of CTS habitat, Variant H-sub1 would require the purchase of 88.84 acres in a mitigation bank or of farmland purchase and placement under a conservation easement. Impacts to CTS aestivation habitat shall be mitigated off-site and shall consist of purchase of CTS credits from an approved mitigation bank or purchase of farmland providing suitable habitat for CTS (where CTS are known to occur) and placement of the land under conservation easement.

At least a 50-foot buffer shall be maintained between wetlands and sprayfields. Mitigation plans shall also include relocation of CTS from development areas (including locations of created wetlands), the use of biological monitors on a daily basis during construction and or excavation activities, and fencing to exclude the CTS from entering the construction zone. Prior to construction work beginning each morning, the biological monitor will check equipment for animals and CTS under construction equipment and stored pipes. The biological monitor shall also check all steep-walled holes and trenches greater than one foot in depth for any CTS. The biological monitor shall remove CTS as needed from equipment and construction-related features (i.e., trenches, holes, etc.). Purchase of credits at an off-site mitigation bank may be implemented if determined to be appropriate by the USFWS during the Section 7 consultation process.

- E. A pre-construction survey for burrowing owls shall be conducted to ensure impacts to burrowing owls, if present in the construction area, do not occur during the nesting season. The pre-construction survey shall be conducted within 30 days prior to initiation of construction activity. If active burrows are found prior to the nesting season, passive relocation measures shall be provided for each burrow in the area of the Wilfred Site, as appropriate, that is rendered biologically unsuitable. Passive relocation measures shall include the creation of two natural or artificial burrows for each burrow rendered biologically unsuitable. Daily monitoring shall be implemented until the owls have been relocated to the new burrows. This measure will reduce potential impacts to burrowing owls. Other mitigation measures may be implemented, in lieu of the proposed mitigation, including avoidance or passive relocation with one-way doors, as outlined in the “Staff Report on Burrowing Owl Mitigation” (CDFG, 1995).
- F. Pre-construction surveys for nesting birds shall be conducted within 30 days prior to initiation of construction activity. If feasible, construction and tree removal (grubbing, vegetation removal) should be timed to take place during late summer months and through winter, ideally from September through February, to avoid impacting nesting birds and other sensitive wildlife species. The approximate nesting season extends from February to September, with a peak nesting period between March through June. If construction or grubbing activities are to take place between late February and late June, a pre-construction survey shall be performed by a qualified biologist to identify any active nests or other special-status species, at least two weeks prior to the start of construction. If bird nests are found, appropriate buffer zones shall be established around all active nests to protect nesting adults and their young from construction disturbance. Through direct consultation with wildlife agency staff, the size of buffer zones shall be determined based on site conditions and species involved. If impacts to nests are unavoidable, consultation shall continue with specific agency guidelines followed for relocation. If construction is delayed for more than two weeks, a second survey shall be performed.
- G. All grading and clearing shall be conducted after April 15 and before October 15 of any year, depending on rainfall and/or site conditions to minimize erosion.

Access roads and routes will be limited, as well as the construction staging area, to the minimum size required to achieve the goals of the project. A speed limit of 15 mph on dirt roads shall be maintained. These practices will limit erosion and dust borne particles.

- H. During construction, vegetation shall only be cleared from the permitted construction footprint and necessary lay-down and assembly areas. Areas cleared of vegetation, pavement, or other substrates shall be stabilized as quickly as possible and BMPs applied (erosion fencing, straw and other material applied to soils) to prevent erosion and runoff that could affect steelhead fish in the Laguna de Santa Rosa.
- I. Hazardous materials including fuels, oils, solvents, etc., shall be stored in sealed containers in a designated location at a minimum of 200 feet from aquatic environments. All fueling and maintenance of equipment shall be conducted at a minimum of 200 feet from aquatic environments.
- J. All food items and food-related trash shall be sealed in containers prior to leaving the construction site at the end of the workday; these items shall be removed from the site once every three days. This measure will limit attraction of wildlife and eliminate trash pollution in the Laguna de Santa Rosa.
- K. Where appropriate, vegetation removed as a result of project activities shall be replaced with native species that are of value to local wildlife. Native plants have a significant cultural value, are generally more valuable as wildlife food sources, and require less irrigation, fertilizers, and pesticides than exotic species.
- L. Turn off as many exterior and interior lights as possible during the peak bird migration hours of midnight to dawn to reduce potential building collisions with migration birds.
- M. Install downcast lights with top and side shields to reduce upward and sideways illumination. This will reduce potential disorientation affects from non-directed shine to birds and wildlife species.
- N. The Tribe shall make feasible changes to the parking lot design, in consultation with the USACE, to reduce wetland fill.

6.5 CULTURAL RESOURCES

- A. The Tribe will implement all mitigation measures concurred upon by the State Historic Preservation Officer (SHPO) during the Section 106 consultation process, including, but not limited to, the following:
 - a. Site RPC- 5 shall be avoided by all ground disturbing activity.

- B. To avoid potential impacts to previously unknown cultural resources, including subsurface resources, the Tribe shall include the following requirements in construction contract specifications for the project:
- a. In the event of any inadvertent discovery of archaeological resources during construction-related earth-moving activities, all such finds shall be subject to Section 106 of the National Historic Preservation Act (NHPA) as amended (36 CFR 800). Once the land has been taken into trust for the Tribe, the inadvertent discovery of archaeological resources is also subject to the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 et seq.) and the Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S.C. 470 aa-mm). Specifically, procedures for post review discoveries without prior planning pursuant to 36 CFR 800.13 shall be followed. The following shall apply to the inadvertent discovery of both archaeological or paleontological resources: All work within 50 feet of the find shall be halted until a professional archaeologist, or paleontologist as appropriate, can assess the significance of the find. If any find is determined to be significant by the archaeologist, or the paleontologist, then representatives of the Tribe and BIA shall meet with the archaeologist, or paleontologist, to determine the appropriate course of action.
 - b. If human remains are discovered during ground-disturbing activities on Tribal lands, pursuant to Native American Grave Protection and Repatriation Act (NAGPRA), Section 10.4 Inadvertent Discoveries, the County coroner, the Tribal Official, and representatives from the BIA and NIGC shall be contacted immediately. No further disturbance shall occur until the County coroner, the Tribal Official, and the BIA and NIGC representatives have made the necessary findings as to the origin and disposition.

6.6 SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

- A. The Tribe shall provide annual payments of at least \$157,500 to Sonoma County to mitigate for fiscal impacts to Sonoma County. The County and the Tribe are free to negotiate payments greater than this amount; however, a MOU must at least provide for annual payments of \$157,500 in order to mitigate fiscal impacts to a less-than-significant level.
- B. Given that Variant H-sub1 has a gaming component that is smaller than FEIS Alternatives A-C, but still larger than most in California, the same crime mitigation payments cited in FEIS Table 5-5 (**Table 4** below) and the City of Rohnert Park MOU would apply. Thus, the Tribe shall provide annual payments of at least \$500,000 to the City of Rohnert Park and \$700,000 to Sonoma County and the additional neighboring cities (distributed per **Table 4**).

TABLE 4
Crime Impact Mitigation

Jurisdiction	Minimum Mitigation (dollars)
Cotati	\$12,808
Petaluma	\$102,591
Santa Rosa	\$286,923
Sebastopol	\$14,596
Unincorporated Sonoma County	\$283,082

SOURCE: Bay Area Economics, 2008. Final Socio-economic Impact Study for the Proposed Graton Rancheria Hotel/Casino Project, February 8, 2008.

- C. The Tribe shall provide at least \$250,000 per year to a problem gambling treatment and prevention program(s). In order to maximize the effectiveness of MOU payments to treatment and prevention programs, the organization that receives the payments for problem gambling treatment must serve the Sonoma County region, and be accessible to County residents.
- D. The Tribe shall prominently display (including on any automatic teller machines (ATMs) located on-site) materials describing the risk and signs of problem and pathological gambling behaviors. Materials shall also be prominently displayed (including on any ATMs located on-site) that provide available programs for those seeking treatment for problem and pathological gambling disorders, including, but not limited to a toll-free hotline telephone number.
- E. The Tribe shall train employees to recognize domestic violence and sexual assault situations, display domestic violence hotline numbers, and work with local agencies in domestic violence and sexual assault prevention.
- F. The Tribe shall conduct annual customer surveys in an attempt to determine the number of problem and pathological gamblers and make this information available to City of Rohnert Park, Sonoma County, state, or federal gaming regulators upon request.
- G. The Tribe shall undertake responsible gaming practices that at a minimum require that employees be educated to recognize signs of problem gamblers, that employees be trained to provide information to those seeking help, and that a system for voluntary exclusion be made available.
- H. ATMs shall be not be visible from gaming machines and gaming tables.

6.7 RESOURCE USE PATTERNS

Transportation/Circulation

Recommended intersection improvements identified in the FEIS traffic impact study (FEIS Appendix O) and the revised traffic impact study in ROD Attachment 4 are identified in **Table 5**. Additional detail on the recommended intersection improvements is contained in Appendix O of the FEIS and Attachment 4. Refer to FEIS Appendix O for traffic improvement recommendations that do not differ between Alternatives A and H (and hence would be the same for Variant H-sub1). Where traffic improvement recommendations differ between Alternatives A and H in FEIS Appendix O, refer to Attachment 4 for the Variant H-sub1 improvement recommendations.

In order to reduce or eliminate Variant H-sub1's traffic impact, the Tribe must pay either a proportionate share or the full cost of the implementation of the recommended traffic improvements. A proportionate share is required when the level of service (LOS) at the study intersection is recorded as an unacceptable LOS without the addition of project trips. In such cases, the Tribe shall be responsible for the incremental impact that the added project trips generate, calculated as a percentage of the costs involved for construction of the mitigation measure. The proportionate share is derived from the percentage that the added project trips contribute to the new total trips at the study intersection. The proportionate share calculation methodology recommended by the agency with jurisdiction shall be used for each individual improvement. In most cases, a full share is required when the LOS at the study intersection is recorded as an acceptable LOS without the addition of project trips. An exception to this general requirement is situations where the project's contribution to operation of an intersection may be relatively small, but sufficient to cause an intersection that is on the verge of operating unacceptably to operate at an unacceptable LOS. Note that the Tribe has independently agreed to "fund any and all mitigation improvements for Wilfred Avenue set forth in the FEIS which are within the County's jurisdiction when the improvements are made, including, but not limited to, any required acquisitions for right of way, environmental studies, and road improvements."

The Tribe shall make funding for implementation of the recommended near term road improvements available prior to initiation of project construction. Funding for long term improvements shall be made available prior to 2020. Funds shall be placed in an escrow account for use by the governmental entity with jurisdiction over the road to be improved so that the entity may design (funding shall be for design standards consistent with those required for similar facilities in the region, unless a deviation is approved by the entity with jurisdiction), obtain approvals/permits for, and construct the recommended road improvement (note that the entity may request that the Tribe directly perform some of these tasks). In some cases, the governmental entity may feel that an improvement slightly differing from that recommended may better facilitate traffic flow while still mitigating the alternative's impact. In this case, the terms of the escrow account shall allow use of the funds provided by the Tribe to implement the improvement even though the improvement differs slightly from that recommended by the traffic impact study.

- A. Since Caltrans' funding is limited, the Tribe shall pay for a proportionate share of the remaining costs (if any) to implement the Caltrans high-occupancy vehicle (HOV) projects along US-101 between Wilfred Avenue and Old Redwood

Highway, thereby assisting in a more expedited and timely construction schedule (near term).

- B. The Tribe shall contribute a proportionate share of the costs to widen Wilfred Avenue from Redwood Drive to Langner Avenue to three lanes in the near term and five lanes in the long term (2020).
- C. The Tribe shall support efforts to complete the US-101 HOV lane project so that it can become operational prior to the scheduled completion as estimated by Caltrans (near term).
- D. The Tribe shall contribute a proportionate share of the remaining costs (if any) of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes and support efforts related to the completion of the project in a timely fashion (near term).
- E. The ramp metering shall be adjusted to account for the additional project traffic at the Wilfred Avenue interchange in the long term (2020).
- F. The Tribe shall contribute a proportionate share to the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Rohnert Park Expressway and from SR-116 to West Sierra Avenue (2020). The Tribe shall contribute a proportionate share to the construction of auxiliary lanes between Rohnert Park Expressway and SR-116 (2020).
- G. Should the above additional traffic lane mitigation on US-101 be infeasible or unavailable as mitigation in the near-term or long-term, the Tribe shall investigate other options to reduce traffic congestion on US-101, such as partial funding of the planned SMART commuter transit system and other regional transit programs.
- H. A Traffic Management Plan (TMP) shall be prepared in accordance with standards set forth in the United State Department of Transportation (USDOT) *Manual on Uniform Traffic Control Devices for Streets and Highways*. The traffic management plan shall be submitted to each affected local jurisdiction and/or agency. Also, prior to construction, the Tribe shall work with emergency service providers to avoid obstructing emergency response service. Police, fire, ambulance, and other emergency response providers shall be notified in advance of the details of the construction schedule, location of construction activities, duration of the construction period, and any access restrictions that could impact emergency response services. The TMP shall include details regarding emergency service coordination. Copies of the TMP shall be provided to all affected emergency service providers.

TABLE 5
PREFERRED ALTERNATIVE INTERSECTION MITIGATION

FEIS Intersection #	Intersection Improvements	Near Term*	2020
		Share	Share
1	Wilfred/Stony Point		
	Signalize	P	P
5	Labath/Wilfred		
	Signalize	P	P
	Add WB left and change WB all shared to through-right	P	
	Add NB right and change NB all shared to left-through	P	P
6	Dowdell/Wilfred		
	Signalize	P	P
	Add WB left and change WB all shared to through right	P	
	Add EB left and change EB all shared to through-right	P	
7	Wilfred/Redwood		
	Change WB left-through to through	F	P
	Change phasing east-west to protected from split	F	P
	Optimize signal timing	F	P
	Add EB left and EB right and change EB all-shared to through-right	F	
10	Golf Course/Commerce		
	Add EB right turn overlap phase	-	P
12	Commerce Blvd./US-101 NB Ramps		
	Construct State Farm – Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing	F	F
14	Business Park/Labath		
	Preferred Alternative access intersection	F	F
17	Labath/Rohnert Park Expwy		
	Extend SB left turn bay to 350 feet (from 100 feet)	F	F
20	US-101 NB Ramps/Rohnert Park Expwy		
	Extend NB left turn lane bay to 400 feet (from 225 feet)	F	F
	Add second NB left turn lane	F	F
21	Commerce Blvd./Rohnert Park Expwy		
	Optimize signal timing	F	-
	Add an EB right turn overlap phase	F	-
22	Stony Point Rd./SR-116		
	Optimize signal timing	-	F
	Add an EB right turn bay for 100 feet	-	F
26	Millbrae/Stony Point Rd		
	Signalize	P	P

NOTE: F = full cost of mitigation measure, P = proportionate cost of mitigation measure, NB = northbound, SB = southbound, EB = eastbound, WB = westbound

- Near term improvements correspond with improvements labeled “2008” in the FEIS. Funding of these improvements shall occur according to the instructions found at the beginning of Section 6.8 in order to ensure that these improvements are in place as near as possible to the project opening date.

SOURCE: Kimley-Horn and Associates, Inc., 2008. Graton Rancheria Casino and Hotel – Alternative A, B, C, D, E, & F Final Traffic Impact Study. July 2008.

- I. Flagging done in consultation with the California Highway Patrol (CHP), Caltrans, and the County's Sheriff's Department, shall be provided when necessary to assist with traffic control.
- J. Importation of construction material shall be scheduled outside of the area wide commute peak hours.
- K. Preferential carpool or vanpool spaces shall be provided at the site to encourage ridesharing by employees and patrons.
- L. The Tribe shall sponsor charter buses from destinations such as Marin County and the North Bay.
- M. The Tribe shall provide a shuttle between the casino and Rohnert Park transit hubs that would operate on a half hour rotational basis during busy hours and on a on call basis in the times when the frequency of employees and patrons arriving or leaving busy is low.
- N. Where feasible, lane closures or obstructions associated with construction shall be limited to off-peak hours to reduce traffic congestion and delays.
- O. Prior to construction, the Tribe shall work to notify all potentially affected parties in the immediate vicinity of the Wilfred Site, as appropriate. Notification shall include a construction schedule, location of construction activities, the duration of construction period, and alternative access provisions.
- P. Emergency service providers shall be notified of the areas that have the greatest potential for unusual traffic delays as a result of construction activities. Specific detours shall be recommended to circumvent any area that might suffer traffic delays.
- Q. The Tribe shall coordinate with the Green Music Center during events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park Expressway interchange may be necessary. Thus, the Tribe shall provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generating high traffic levels. Should conflicts occur, the Tribe shall provide traffic management coordination between the project and the Green Music Center, in consultation with the CHP and Caltrans.
- R. Debris along construction vehicle routes shall be monitored daily during construction and the roadways cleaned as necessary.
- S. The Tribe shall contribute their fair share to bicycle and pedestrian facilities that will increase casino patronage. The Tribe shall consider bicycle and pedestrian circulation in the design of intersections and turning movements, and that adequate

sidewalk facilities, striped crosswalks, and pedestrian countdown signals for elderly and disabled citizens be provided.

- T. The Tribe shall minimize the amount of construction fill transported on the surrounding street network by eliminating the off-site travel route except where necessary to obtain materials that cannot be obtained on-site. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.
- U. Construction material importation shall be scheduled outside of the area wide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways shall be cleaned as necessary.
- V. Roadways subject to fill truck traffic shall be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, the Tribe shall pay to have surrounding roadways resurfaced to restore the pavement to at least pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements. In any event, the Tribe shall fully fund the restructuring of Labath Avenue and Langner Avenue between Wilfred Avenue and Business Park Drive following construction to facilitate site access.
- W. Even if Wilfred Avenue is not widened to increase capacity, due to the increased use of the roadway in combination with future cumulative traffic, the Tribe shall make a proportionate share contribution to roadway improvements along Wilfred Avenue from Redwood Drive to Stony Point Road, including widened shoulders and Class II bike lanes consistent with applicable standards.

Land Use

- X. The Tribe shall maintain the existing Williamson Act requirements in place in accordance with the provisions of that Act.

6.8 PUBLIC SERVICES

Solid Waste

Construction

- A. Construction waste shall be recycled to the fullest extent practical by diverting green waste and recyclable building materials away from the solid waste stream.

- B. Environmentally preferable materials shall be used to the extent practical for construction of facilities.

Operation

- C. A solid waste management plan shall be adopted by the Tribe that addresses recycling and solid waste reduction on-site. The plan shall have a goal of at least 25% diversion of materials from disposal, which includes reduction, recycling, and reuse measures.
- D. The Tribe shall install a trash compactor for cardboard and paper products.
- E. The Tribe shall install recycling bins throughout the facilities for glass, cans, and paper products.
- F. Decorative trash and recycling receptacles shall be placed strategically throughout the area of the Wilfred Site, Stony Point site, or the Lakeville site, as appropriate, to encourage people not to litter at the facilities.
- G. Security guards shall be trained to discourage on-site littering.
- H. The Tribe shall pay all standard fees for trash collection and disposal.

Electricity, Natural Gas, and Telecommunication

- I. Air conditioning and refrigeration systems shall utilize environmentally friendly refrigerants. Energy efficient chillers shall also be utilized.
- J. The air handling systems shall utilize outside air economizer cycles to take advantage of ambient cooling when the outside air temperature is below 55 degrees F
- K. For applicable alternatives, hotel and casino buildings shall be equipped with a direct digital energy management and control system to perform energy conservation measures, such as optimum start/stop, duty cycling, and demand limiting.
- L. The Tribe shall use energy efficient appliances where feasible.

Public Health and Safety

- M. The Tribe shall make an agreement with the applicable City or County department to address inspection, maintenance, and operation of any swimming pools, spas, or hot tubs available to patrons. The terms of the agreement shall include design review of the swimming facilities, inspection of the swimming facilities prior to operation, and at least one annual inspection for seasonal swimming facilities or bi-annual inspections for year-round swimming facilities thereafter. The agreement shall include a commitment to comply with standards for design, maintenance, and operation similar to those followed by non-tribally owned businesses in the City or County, as applicable.

Law Enforcement

- N. The Tribe shall provide on-site security to reduce and prevent criminal and civil incidents.
- O. The Tribe shall adopt employee training programs and policies relating to responsible beverage services with annual training, which would include, but not be limited to, checking patron identification and refusing service to those who have imbibed beyond their ability to function safely. The Tribe shall collaborate with law enforcement by warning intoxicated patrons not to drive and by reporting drunk drivers to the authorities.
- P. The Tribe shall support local law enforcement efforts in conducting driving under the influence (DUI) checkpoints and other programs known to reduce the impacts of alcohol on the community (support shall include fully funding at least one DUI checkpoint in the vicinity of the Wilfred Site monthly or less frequently at the discretion of local law enforcement providers).
- Q. All parking areas shall be well lit and monitored by parking staff and/or security guards. This will aid in the prevention of auto theft and other related criminal activity.
- R. The Tribe shall provide traffic control with appropriate signage and the presence of peak-hour traffic control staff. This will aid in the prevention of off-site parking, which could create possible security and safety issues.
- S. The Tribe shall pass an ordinance creating a standard policy that encourages responsible drinking and designated driver programs. As part of this policy, the employees serving alcohol shall undergo annual Responsible Beverage Service Training (RBST), also known as “server training.” RBST educates managers, servers and sellers at alcohol establishments about strategies to avoid illegally selling alcohol to underage youth or intoxicated patrons. The goal of RBST is to decrease the number of illegal alcohol sales to underage youth and intoxicated patrons through education programs. Information provided in server training must at a minimum include:

- The importance of checking age identification of customers who appear to be under the age of 30.
 - How to identify fake IDs and what to do once a fake ID is confiscated.
 - How to recognize situations in which adults are buying alcohol for underage youth.
 - How to refuse sales to individuals who may supply alcohol to underage youth.
 - How to identify intoxicated customers.
 - How to refuse service to underage youth and intoxicated customers.
- T. To mitigate potential impacts to law enforcement resources, the Tribe shall adopt rules prohibiting anyone under 21 years of age from gambling, adopt employee training programs and policies relating to responsible beverage services with annual training, conduct background checks of all gaming employees, provide a full complement of security personnel at the Wilfred Site during all times, and adopt programs and policies which discourage gang members from visiting the gaming facilities.
- U. Hotel management shall work collaboratively with school and law enforcement personnel to prevent the use of hotel rooms for parties involving minors and the hotel shall have an internal monitoring program to reduce the incidence of such parties
- V. Areas surrounding the gaming facilities shall have “No Loitering” signs in place, shall be well lit and shall be patrolled regularly. This will aid in the prevention of illegal loitering and loitering behavior that could potentially lead to other criminal acts.

Fire Protection/Emergency Medical Service

Construction

- W. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws. During construction, staging areas, building areas, and/or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fuel for combustion. To the extent feasible, the contractor shall keep these areas clear of combustible materials to maintain a firebreak.

Operation

- X. The Tribe shall make reasonable provisions for adequate emergency, fire, medical, and related relief and disaster services for patrons and employees including the development of a disaster management plan.
- Y. The Tribe shall use fire resistant construction materials and equip all enclosed buildings with automatic sprinkler systems. The automatic sprinkler systems shall be designed to meet or exceed the National Fire Protection Association (NFPA) standards governing the different occupancies associated with the project structures.
- Z. The Tribe shall employ the most modern construction and fire-engineering techniques in their automatic fire containment system designs so that any fire encountered is contained to the room of origin.
- AA. Through the use of modern fire engineering technology, the Tribe shall create and maintain a facility equipped with early detection systems that assure an initial response time to any fire alarm (automatic, local, or report) within three minutes. These systems shall include automatic sprinkler systems in the occupied areas and smoke detection, along with automatic sprinkler systems, in the areas of the facility that are normally unoccupied, such as storerooms and mechanical areas.
- BB. If only one fire pump is provided, it will be either diesel, or provided with emergency power; thereby, meeting the requirements of the California Fire Code (CFC), and the CBC.
- CC. Prior to operation, the Tribe shall enter into an agreement with a fire service provider to provide primary fire protection services.
- DD. Prior to operation, the Tribe shall enter into a contract with AMR or another entity for ambulance service.

6.9 NOISE

- A. On-site HVAC equipment shall be shielded to reduce noise.
- B. To the extent feasible, HVAC equipment shall be located a significant distance from neighboring houses along Whistler Avenue, Wilfred Avenue, and Labath Avenue. Whenever an HVAC unit is to be placed within 125 feet of an existing residence, an acoustical analysis shall be required to demonstrate that the HVAC noise level does not exceed 45 dBA at the nearest residence.
- C. The Tribe shall fully fund the cost of installation of acoustically-rated, dual pane windows (with a minimum Sound Transmission Class (STC) rating of 30) and acoustically rated doors on the facades facing the noise source(s) to minimize noise effects for residences adjacent to Wilfred Avenue between Redwood Drive and Stony Point Road.

- D. The Tribe shall fully fund the cost for the construction of raised, landscaped berms or solid walls at least 8 feet in height in order to separate sources of unwanted noise (including on-site traffic circulation noise) from potential noise receptors along Wilfred Avenue. Should a wall be installed, it shall be attractively designed. Adjacent landowners and adjacent governmental jurisdictions shall be consulted with prior to finalizing the design of the berm or wall.
- E. Unnecessary vehicle idling shall be prevented during loading dock operations occurring between the hours of 10:00 PM and 7:00 AM.
- F. Buses shall not be allowed to idle unnecessarily in areas adjacent to sensitive receptors. Bus parking areas shall also be located as far as feasible from sensitive receptors.
- G. To the extent feasible, project construction shall not occur prior to 7:00 AM or after 10:00 PM.
- H. Pile driving, should it take place, shall not occur prior to 9:00 AM or after 5:00 PM.
- I. On-site wastewater treatment plant equipment shall be shielded or enclosed.
- J. Stationary noise-producing equipment such as compressors and generators shall be placed as far as practical from homes, and shielding shall be provided between any such equipment and homes when it is necessary to operate the equipment closer than 200 feet from a home.

6.10 HAZARDOUS MATERIALS

- A. In the event that contaminated soil and/or groundwater are encountered during construction related earth-moving activities, all work shall be halted until a professional hazardous materials specialist or a qualified environmental professional can assess the extent of contamination. If contamination is determined to be significant, representatives of the Tribe shall consult with USEPA to determine the appropriate course of action, which may include the development of a Sampling Plan and Remediation Plan if necessary.
- B. To reduce the potential for accidental releases, fuel, oil, and hydraulic fluids shall be transferred directly from a service truck to construction equipment and shall not otherwise be stored on-site. Paint, paint thinner, solvents, cleaners, sealants, and lubricants used during construction shall be stored in a locked utility building, handled per the manufacturers' directions, and replenished as needed.
- C. Personnel shall follow written standard operating procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to

reduce the potential for incidents involving the hazardous materials, shall include the following:

- a. Refueling shall be conducted only with approved pumps, hoses, and nozzles.
 - b. Catch-pans shall be placed under equipment to catch potential spills during servicing.
 - c. All disconnected hoses shall be placed in containers to collect residual fuel from the hose.
 - d. Vehicle engines shall be shut down during refueling.
 - e. No smoking, open flames, or welding shall be allowed in refueling or service areas.
 - f. Refueling shall be performed away from bodies of water to prevent contamination of water in the event of a leak or spill.
 - g. Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents.
 - h. Should a spill contaminate any soil, the soil shall be put into containers and disposed of in accordance with local, state, and federal regulations.
 - i. All containers used to store hazardous materials shall be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas shall be inspected monthly. Results of inspections shall be recorded in a logbook that shall be maintained on-site.
 - j. Staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fuel for combustion. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.
 - k. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order.
- D. The amount of hazardous materials used in project construction and operation shall be kept at the lowest required volumes.
- E. The least toxic material capable of achieving the intended result shall be used to the extent practicable. Non-toxic alternatives shall include garden care products and organic non-toxic cleaners when feasible.

- F. A hazardous materials and hazardous waste minimization program shall be developed, implemented, and reviewed annually by the Tribe to determine if additional opportunities for hazardous materials and hazardous waste minimization are feasible, for both project construction and operation.
- G. Use of pesticides and toxic chemicals shall be minimized to the greatest extent feasible in landscaping; or less toxic alternatives shall be used.
- H. In addition to mitigation described under FEIS Section 5.2.2, the following mitigation shall be implemented: During the groundwater monitoring and pump tests, the potential for the vertical and lateral migration of contaminants from nearby leaking underground storage tank (LUST) sites shall be evaluated (see FEIS Appendix Z for detailed recommendations). The pumping test conducted shall include taking water level measurements in wells that are screened in the Lower Intermediate Zone, Upper Intermediate Zone, and uppermost portion of the saturated zone to verify the conclusions based on historical well hydrographs, refine the drawdown model for the Site, and evaluate the potential for contaminant migration using a typical wellhead protection approach. Implementation of the above measures will reduce any potential impacts to less than significant.
- I. Material Safety Data Sheets (MSDS) will be available to casino and emergency personnel and to janitors that identify emergency procedures, safe handling and storage practices. A Hazardous Materials Business Plan for the WWTP will be prepared to address emergency response and employee training in first aid in the event a spill of citric acid and sodium hypochloride occurs that compromises the chemical storage containment vessels.
- J. A Wastewater Contingency Plan shall be prepared for the WWTP prior to construction that shall identify potential system failures and containment measures. These containment measures shall be made part of the WWTP design to ensure no untreated wastewater will be released from the WWTP in the event of a system failure.
- K. Prior to demolition of any residential structures on the Wilfred Site, an asbestos consultant will be hired by the Tribe to determine if Asbestos Containing Materials (ACMs) and lead based paints are present within the residential structures. If ACMs are present within the residential structures, the Tribe shall comply with any federal NESHAP laws requiring BMPs to be employed during demolition as well as recommendations from the asbestos consultant for the removal and disposal of demolition debris that contain lead based paints and ACMs. Recommendations shall at a minimum include BMPs such as applying water to the structures before, during, and after demolition.

6.11 AESTHETICS

- A. Design elements shall be incorporated into the project to minimize the impact of buildings and parking lots on the views shed. These elements include:
 - a. Incorporation of landscape amenities to complement buildings and parking areas, including setbacks, raised landscaped berms and plantings of trees and shrubs (see Noise Mitigation Measures)
 - b. Use of earth tones in paints and coatings, and native building materials such as stone.
- B. To minimize the impacts of light and glare:
 - a. Placement of floodlights on buildings shall be set so as not to cast trespassing light off-site.
 - b. Uplighting of structures has a high potential for off-site light spillage and shall be minimized by limiting uplighting to the main casino and hotel facades and prohibiting uplighting of the parking structure and ancillary structures. Any uplighting of the main casino and hotel facades shall be directly focused on the structures.
 - c. Shielding, such as with a horizontal shroud, shall be used for all outdoor parking lot lighting so as to ensure it is downcast.
 - d. Timers shall be utilized so as to minimize lighting after a certain hour.
 - e. Signs and facades shall be tastefully designed, without the use of obtrusive light emitting devices such as neon lights or flashing lights.
 - f. All exterior glass shall be non-reflective low-glare glass.

6.12 LEED CERTIFICATION

- A. The Tribe shall pursue LEED Certification for the hotel component of the project.

6.13 MITIGATION MEASURES THAT ARE NOT ADOPTED

CEQ NEPA regulations 40 C.F.R. § 1505.2(c) call for identification in the ROD of any mitigation measures specifically mentioned in the FEIS that are not adopted. There are no mitigation measures listed in the FEIS for the Preferred Alternative that are not included in this ROD.

7.0 DECISION

The NIGC has determined that it will implement the Preferred Alternative, as described above and in Attachment 3. This decision has been made based upon the environmental impacts identified in the EIS and in Attachment 3, as well as a consideration of economic and technical factors. While the No-Action Alternative (Alternative G) and Wilfred Site Reduced Intensity Alternative (Alternative H) may result in somewhat lower environmental impacts, these alternatives would limit the ability of the Tribe to facilitate and promote tribal economic development, self-determination and self-sufficiency. The No-Action Alternative would result in no net income or other economic benefits to the Tribe, and thus does not meet the stated purpose and need. Likewise, Alternative H would limit the beneficial effects that would otherwise be available to the Tribe under the Preferred Alternative.

The Preferred Alternative results in substantially greater beneficial effects for the Tribe and local communities than any of the other alternatives (see FEIS Section 4.7 and Appendix E (MOU)), with the exception of the full size casino alternatives o (Alternatives A, B, C, and F). However, these alternatives are expected to result in greater environmental effects. All potential impacts from the Preferred Alternative would be reduced to a less than significant level through the implementation of mitigation measures discussed above in Section 6.0. Therefore, the NIGC shall implement the Preferred Alternative subject to implementation of all mitigation measures listed in Section 6.0.

8.0 SIGNATURE

By my signature, I indicate my decision to implement the Preferred Alternative.



By:

Its:

10-01-10

Date

ATTACHMENT 1

Notice of Final Determination to Take Land into Federal Trust

[Federal Register: May 7, 2008 (Volume 73, Number 89)]
[Notices]
[Page 25766-25768]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr07my08-106]

DEPARTMENT OF THE INTERIOR

Bureau of **Indian** Affairs

Land Acquisitions; Federated Indians of Graton Rancheria,
California

AGENCY: Bureau of **Indian** Affairs, Interior.

ACTION: Notice of Final Agency Determination To Take Land into Trust
under 25 CFR Part 151.

SUMMARY: The Assistant Secretary--**Indian** Affairs made a final agency
determination to acquire approximately 254 acres of land into trust for
the Federated Indians of Graton Rancheria of California on April 18,
2008. This notice is published in the exercise of authority delegated
by the Secretary of the Interior to the Assistant Secretary--**Indian**
Affairs by 209 Departmental Manual 8.1.

FOR FURTHER INFORMATION CONTACT: George Skibine, Director, Office of
Indian Gaming, MS-3657 MIB, 1849 C Street, NW., Washington, DC 20240;
Telephone (202) 219-4066.

SUPPLEMENTARY INFORMATION: This notice is published to comply with the
requirement of 25 CFR Part 151.12(b) that notice be given to the public
of the Secretary's decision to acquire land in trust at least 30 days
prior to signatory acceptance of the land into trust. The purpose of
the 30-day waiting period in 25 CFR 151.12(b) is to afford interested
parties the opportunity to seek judicial review of final administrative
decisions to take land in trust for **Indian** tribes and individual
Indians before transfer of title to the property occurs. On April 18,
2008, the Assistant Secretary--**Indian** Affairs decided to accept
approximately 254 acres of land into trust for the Federated Indians of
Graton Rancheria of California. The Graton Rancheria was restored to
federal recognition pursuant to Title XIV of Public Law 106-568 (the
Graton Rancheria Restoration Act), 25 U.S.C. 1300n-3, which mandates
that, ``the Secretary shall accept into trust for the benefit of the
Tribe any real property located in Marin or Sonoma County...'. The 254
acre parcel is located in Sonoma County, California.

The legal description of the property is as follows:

Tract One

Farms 102, 103, 104, 105, 106, 124, 125, 126 and 127, as shown upon
the Map of Plan of Subdivision of Santa Rosa Farms No. 2, filed March
7, 1910 in the Office of the County Recorder of Sonoma County in Book
21 of Maps, Page 14, Sonoma County Records. Certificate of Compliance
recorded January 28, 1998 as Document No.'s 1998 0008588 through 1998
0008596, Sonoma County Records. Being Assessors Parcel No. 045-073-001

Tract Two

Parcel One

Farms 130 and 131 as shown upon the Map of Plan of Subdivision of Santa Rosa Farms No. 2 filed March 7, 1910 in the Office of the County Recorder of Sonoma County in Book 21 of Maps, Page 14, Sonoma County Records. Certificate of Compliance recorded January 28, 1998 as Document No.'s 1998 0008597 and 1998 0008598, Sonoma County Records. Being a portion of Assessor's Parcel No. 045-074-009.

[[Page 25767]]

Parcel Two

Farm 129 of Santa Rosa Farms No. 2, according to Map thereof filed in the Office of the County Recorder of said County on March 7, 1910 in Book 21 Maps, Page 14, Sonoma County Records.

Being Assessor's Parcel No. 045-074-010.

Parcel Three

Farm No. 128 as same is shown upon that certain Map Entitled ``Plan of Subdivision of Santa Rosa Farms No. 2, Sonoma Co., Cal., Etc.'', filed March 7, 1910 in Book 21 of Maps at Page 14.

Saving and Excepting Therefrom, the following:

Commencing at the Southeasterly corner of said Farm No. 128; thence Northerly along the Eastern line thereon, 155 feet and 7 inches to a point, for the actual point of commencement of the tract to be herein described; thence from said point of commencement, South 89[deg] West, 289 feet and 6 inches to a point; thence Northerly, parallel with the Eastern line of said Farm No. 128, a distance of 155 feet and 10 inches to a point; thence North 89[deg] East, 289 feet and 6 inches to the Eastern line of said Farm No. 128; thence Southerly along said Eastern line, 155 feet and 10 inches to the point of commencement.

Also Saving and Excepting Therefrom, the following:

Beginning at a point on the center line of Labath Avenue, which point is the Southeast corner of Lot 128 as shown upon the Map entitled ``Plan Of Subdivision of Santa Rosa Farms No. 2, Sonoma Co., Cal., Etc.'', filed March 7, 1910 in Book 21 of Maps, Page 14, Sonoma County Records; thence North 1[deg] West along the Easterly line of Lot 128, a distance of 155 feet, 7 inches to a point; thence South 89[deg] West, 289.5 feet; thence North 1[deg] West, 77 feet, 10 inches; thence South 89[deg] West, 283.66 feet to the Westerly line of said Lot 128; thence along said line, South 1[deg] East, 233.5 feet to the Southwest corner of said Lot 128; thence along the Southerly line of said Lot, North 89[deg] East, 573.16 feet to the point of beginning.

Being Assessor's Parcel No. 045-073-002.

Tract Three

A Portion of Farm No. 128 as shown upon the Map entitled ``Plan of Subdivision of Santa Rosa Farms No. 2, Sonoma County, California'', filed in the Office of the County Recorder of Sonoma County, California, on March 7, 1910 in Book 21 of Maps, page 14, more particularly described as follows:

Commencing at the Southeasterly corner of said Farm No. 128; thence Northerly along the Easterly line thereof, 155 feet, 7 inches to a point for the true point of beginning of the tract to be herein described; thence South 89[deg] West 289 feet, 6 inches to a point; thence Northerly parallel with the Easterly line of said Farm No. 128, a distance of 155 feet, 10 inches to a point; thence North 89[deg] East, 289 feet, 6 inches to the Easterly line of said Farm No. 128; thence Southerly along said Easterly line, 155 feet, 10 inches to the point of beginning.

Being Assessor's Parcel No. 045-073-003.

Tract Four

Beginning at a point on the center line of Labath Avenue which point is the Southeast corner Lot 128 as shown upon the Map entitled Plan of Subdivision of Santa Rosa Farms No. 2, Sonoma County, California, etc., filed March 7, 1910 in Book 21 of Maps, page 14, Sonoma County Records; thence North 1[deg] West along the Easterly line of Lot 128, a distance of 155 feet 7 inches to a point; thence South 89[deg] West, 289.5 feet; thence North 1[deg] West, 77 feet 10 inches; thence 89[deg] West, 283.66 feet to the Westerly line of said Lot 128; thence along said line South 1[deg] East, 233.5 feet to the Southwest corner of said Lot 128; thence along the Southerly line of said Lot, North 89[deg] East, 573.16 feet to the point of beginning.

Being Assessor's Parcel No. 045-073-004.

Tract Five

A tract of land, being a portion of the Rancho Llano de Santa Rosa, and commencing on the boundary line of said Rancho on the line between Section 21 and 22, in Township 6 North, Range 8 West, Mount Diablo Base & Meridian, at a point in the center of the County Road known as the Santa Rosa and Stony Point Road, from which point the post for the railing of the bridge, across the Laguna and standing on the Southeast corner of the same, is North 31[deg] West, 13 links distant; thence from said point of beginning, North 89[deg] 30' East, 11.92 chains, South 39[deg] 05' East, 2.61 chains, South 53[deg] East, 1.36 chains, South 64[deg] East, 1.23 chains, South 77[deg] 15' East, 2.62 chains, South 88[deg] 05' East, 3.94 chains, North 4[deg] 15' East, 1.43 chains, South 88[deg] East, 2.03 chains, South 56[deg] East, 2.44 chains, North 87[deg] 15' East, 22.62 chains to the Northwest boundary line of the Cotati Rancho; thence along said line, North 29[deg] 15' East, 39.44 chains; thence leaving said line, West 67.92 chains to the center of the aforesaid Road and Section line; thence South, 32.18 chains to the point of beginning. Magnetic Variation 17[deg] East.

Excepting therefrom those portions of land described in the Deeds from Manuel T. Pimentel, et al, to the Sonoma County Flood Control and Water Conservation District, recorded August 16, 1961 in Book 1840 of Official Records, page 280, Serial No. G-60050, Sonoma County Records, and recorded September 24, 1963 in Book 1989 of Official Records, page 575, Serial No. H-56600, Sonoma County Records.

Also excepting therefrom that portion of land described in the Deed from Mary C. Pimentel, et al, to the Sonoma County Flood Control and Water Conservation District, recorded February 11, 1966 in Book 2187 of Official Records, page 957, Serial No. J-83549, Sonoma County Records.

Also excepting therefrom that portion of land described in the Deed to the City of Rohnert Park, recorded January 11, 1989, as Document No. 89002750 of Official Records of Sonoma County.

Also excepting therefrom that portion of land described in the Deed to the County of Sonoma, recorded May 17, 1996 as Document No. 1996 0044116 of Official Records of Sonoma County.

An easement for cattle and agricultural equipment crossing, as described in the Deed from the Sonoma County Flood Control and Water Conservation District to Manuel L. Pimentel and Mary C. Pimentel, recorded August 15, 1961 in Book 1840 of Official Records, page 284, Serial No. G-60051, Sonoma County Records.

An easement for cattle and agricultural equipment crossing, as described in the Deed from the Sonoma County Flood Control and Water Conservation District to Manuel L. Pimentel and Mary C. Pimentel, recorded August 15, 1961 in Book 1840 of Official Records, page 288, Serial No. G-60052, Sonoma County Records.

Being Assessor's Parcel Nos. 046-021-020 & 021, 046-021-039 & 040.

Tract Six

All that certain real property situated in the City of Rohnert Park, County of Sonoma, State of California, described as follows: Lot

6, as shown on the map of ``Rohnert Business Park Subdivision'', filed August 12, 1985 in the office of the County Recorder in Book 375 of Maps, at pages 10 and 11, Sonoma County Records.

Being Assessor's Parcel No. 143-040-068.

[[Page 25768]]

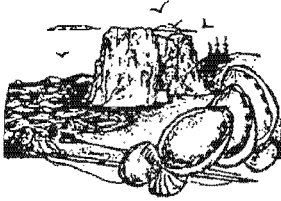
Dated: April 18, 2008.

Carl J. Artman,
Assistant Secretary--**Indian** Affairs.

[FR Doc. E8-10064 Filed 5-6-08; 8:45 am]
BILLING CODE 4310-4N-P

ATTACHMENT 2

Tribal Resolution 09-03-GC



FEDERATED INDIANS OF *Graton Rancheria* **FEDERATED INDIANS OF GRATON RANCHERIA**

RESOLUTION AUTHORIZING TRIBAL COMPLIANCE WITH THE WILLIAMSON ACT CONTRACT, CALIFORNIA GOVERNMENT CODE § 51200 *ET. SEQ.*, ON 181 ACRES OF LAND THAT COMPRISE A PORTION OF CERTAIN LANDS WHICH HAVE BEEN APPROVED TO BE TAKEN INTO TRUST FOR THE TRIBE PURSUANT TO THE GRATON RANCHERIA RESTORATION ACT ON APRIL 18, 2008, AND A LIMITED WAIVER OF THE TRIBE'S SOVEREIGN IMMUNITY IN FAVOR OF THE COUNTY OF SONOMA WITH RESPECT TO THE FUTURE ENFORCEABILITY OF THE WILLIAMSON ACT CONTRACT.

GENERAL COUNCIL RESOLUTION NO.: 09-03-GC

DATE APPROVED: February 14, 2009

WHEREAS: The Federated Indians of Graton Rancheria (the "Tribe") is a federally recognized Indian tribe organized pursuant to the Constitution of the Federated Indians of Graton Rancheria, approved by the Secretary of the Interior on December 23, 2002, (the "Constitution"); and

WHEREAS: Article III, Section 1 of the Constitution provides that the governing body of the Tribe is the Tribal Council; and

WHEREAS: Article VI, Section 2 of the Constitution reserves to the General Council the power to waive the Tribe's sovereign immunity to unconsented suit; and

WHEREAS, The Tribe has requested the Secretary to acquire certain lands in trust for the Tribe as the Tribe's reservation pursuant to the Graton Rancheria Restoration Act, 25 U.S.C. §1300n; and

WHEREAS, Some of these lands are currently subject to a contract that restricts the primary use of those lands to agricultural and compatible uses pursuant to the California Land Conversation Act of 1965, California Government Code § 51200 *et. seq.* (the "Williamson Act"); and

WHEREAS: The Tribe intends to comply with the land use restrictions of the Williamson Act contract until, if ever, the County of Sonoma is given notice of non-renewal, and the contract expires by its own terms; and

WHEREAS: The Tribe wishes to eliminate any ambiguity concerning whether the terms of the Williamson Act contract are enforceable once the Tribe becomes the beneficial owner of these lands; and



WHEREAS: The Tribe wishes to eliminate any ambiguity concerning whether the terms of the Williamson Act contract are enforceable once the Tribe becomes the beneficial owner of these lands; and

WHEREAS: The Tribe fully expects to enter into an agreement with the County of Sonoma providing for joint recognition of the validity of the Williamson Act contract on said lands pursuant to the legally binding Memorandum of Understanding between the Tribe and the County of Sonoma dated November 1, 2004 ("2004 County MOU"), which obligates the Tribe to enter into an intergovernmental agreement "with the County regarding the loss of any open space, community separator, and Williamson Act issues"; and

WHEREAS: The Tribal Council has requested that the General Council confirm future compliance with the land use provisions of the Williamson Act and approve a limited waiver of the Tribe's sovereign immunity with regard to disputes specifically arising under the Williamson Act contract in order to resolve any ambiguities concerning future enforceability of said contract, and to consent to State court jurisdiction as provided for herein; and

WHEREAS: Providing for the enforceability of the Williamson Act contract is consistent with the intent of the 2004 County MOU and the Tribe's commitment to respect local land use laws as demonstrated by the Tribe's willingness to relocate its proposed resort project site to lands within the urban growth boundary of the City of Rohnert Park and to address the applicability of land use laws on other lands which the Tribe may acquire in the future pursuant to the Tribe's Memoranda of Understanding with the County of Sonoma and the County of Marin respectively, each dated July 22, 2008.

NOW, THEREFORE, BE IT RESOLVED THAT the Tribe will comply with the land use restrictions of the Williamson Act for those lands that are subject to a Williamson Act, and that are more particularly described in Exhibit A to this agreement, until such time, if ever, that the Williamson Act contract term expires; and

BE IT FURTHER RESOLVED THAT the General Council hereby expressly grants a limited waiver of the Tribe's sovereign immunity in favor of the County of Sonoma (but not as to any other person or entity) pertaining solely to disputes specifically related to or arising under the Williamson Act contract that pertains to the lands described in Exhibit A and consents to the jurisdiction of the State courts for the resolution of such disputes; and

BE IT FURTHER RESOLVED THAT the General Council hereby exercises its delegated authority to approve the enforceability of the land use provisions of the Williamson Act contract in favor of the County of Sonoma; and

BE IT FURTHER RESOLVED THAT the Tribe, through the General Council in exercising its delegated authority, declares that the Williamson Act contract upon the Tribe becoming the beneficial or legal owner of said lands shall be and become a valid and legal obligation of the Tribe; and

BE IT FURTHER RESOLVED THAT the limited waiver of sovereign immunity shall only apply to injunctive or declarative relief and does not apply to monetary damages, attorneys fees, court costs or any other payment of monies; and

BE IT FURTHER RESOLVED THAT the Tribe, through the General Council in exercising its delegated authority, hereby determines that no laws, ordinances, resolutions or other actions of the Tribe, Tribal Council, Board, or any of the agencies or instrumentalities of the Tribe, either written or established by custom or tradition, prohibit the General Council from approving the enactment of this resolution; and

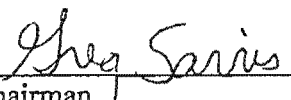
BE IT FURTHER RESOLVED THAT the limited waiver of sovereign immunity shall only expire if and when the Williamson Act contract expires by its own terms should the Tribe choose not to renew it in accordance with the Williamson Act or if the contract is cancelled by the County in accordance with Williamson Act; and

BE IT FURTHER RESOLVED THAT nothing herein shall be construed as a waiver by the Tribe not to exercise it's right not to renew the contract should it decide to do so; and

BE IT FURTHER RESOLVED THAT the General Council or Tribal Council shall not pass or adopt any resolutions or approve or allow any other action of the Tribe, or any of its officers, employees, agents, subdivisions, agencies or instrumentalities, or any nature that shall impair the obligations of the Tribe under this resolution or that would rescind or modify this waiver of sovereign immunity or ratification of the applicability of the Williamson Act contract once the land is placed in trust for the benefit of the Tribe.

CERTIFICATION

We the undersigned do hereby certify that the foregoing resolution was duly adopted by the General Membership on the 14 day of **February**, 2009, at a General Council meeting at which a quorum of the registered voters was present, by a vote of 90 for 0 opposed, and 0 abstaining, and that said Resolution has not been rescinded or amended in any way.


Chairman

ATTEST:

Secretary

ATTACHMENT 3

Variant H-sub1

VARIANT H-SUB1

The Final Environmental Impact Statement (FEIS) identified Alternative A as both the Proposed Project and the National Indian Gaming Commission's (NIGC) Preferred Alternative. However, in letters received during the FEIS waiting period by the United States Environmental Protection Agency (USEPA) and Sonoma County, it was suggested that the NIGC consider adopting a reduced intensity version of Alternative A. After carefully considering this input, the NIGC has decided to approve a slightly modified version of Alternative H (hereinafter referred to as Variant H-sub1 or the Preferred Alternative) rather than Alternative A. Modifications include (1) reconfiguring the layout of Alternative H in order to further reduce potential impacts on biological resources, and (2) providing certain hotel and restaurant amenities in order to better meet the purpose and need for the federal action. This decision is responsive to comments from Sonoma County and the USEPA recommending that the NIGC adopt a reduced-intensity alternative to the proposed project. At the same time this decision is consistent with the purpose and need for the federal action. Finally, as explained below, the Preferred Alternative falls within the range of alternatives analyzed in the EIS and has been thoroughly evaluated by the NIGC.

In short, this decision represents a reasonable and fair accommodation of the interests expressed by the Tribe, the County, the USEPA, and interested members of the public. This decision is also a continuing demonstration of the results of the application of the National Environmental Policy Act (NEPA) process, of which this Record of Decision (ROD) is the final step, which has resulted in continuing measures being taken to reduce environmental impacts (see FEIS Sections 1.0 and 2.0 for more on the history of this process). This process of reducing impacts has continued right up through the ROD, which further reduces impacts from those involved in the preferred alternative that was identified in the FEIS. This is an example of the NEPA process successfully resulting in reducing the environmental impact of what has been proposed.

A description and an analysis of the environmental impacts of Variant H-sub1 is included below. Required mitigation has been modified in Section 6.0 of the ROD to account for reductions in impacts that would occur under Variant H-sub1.

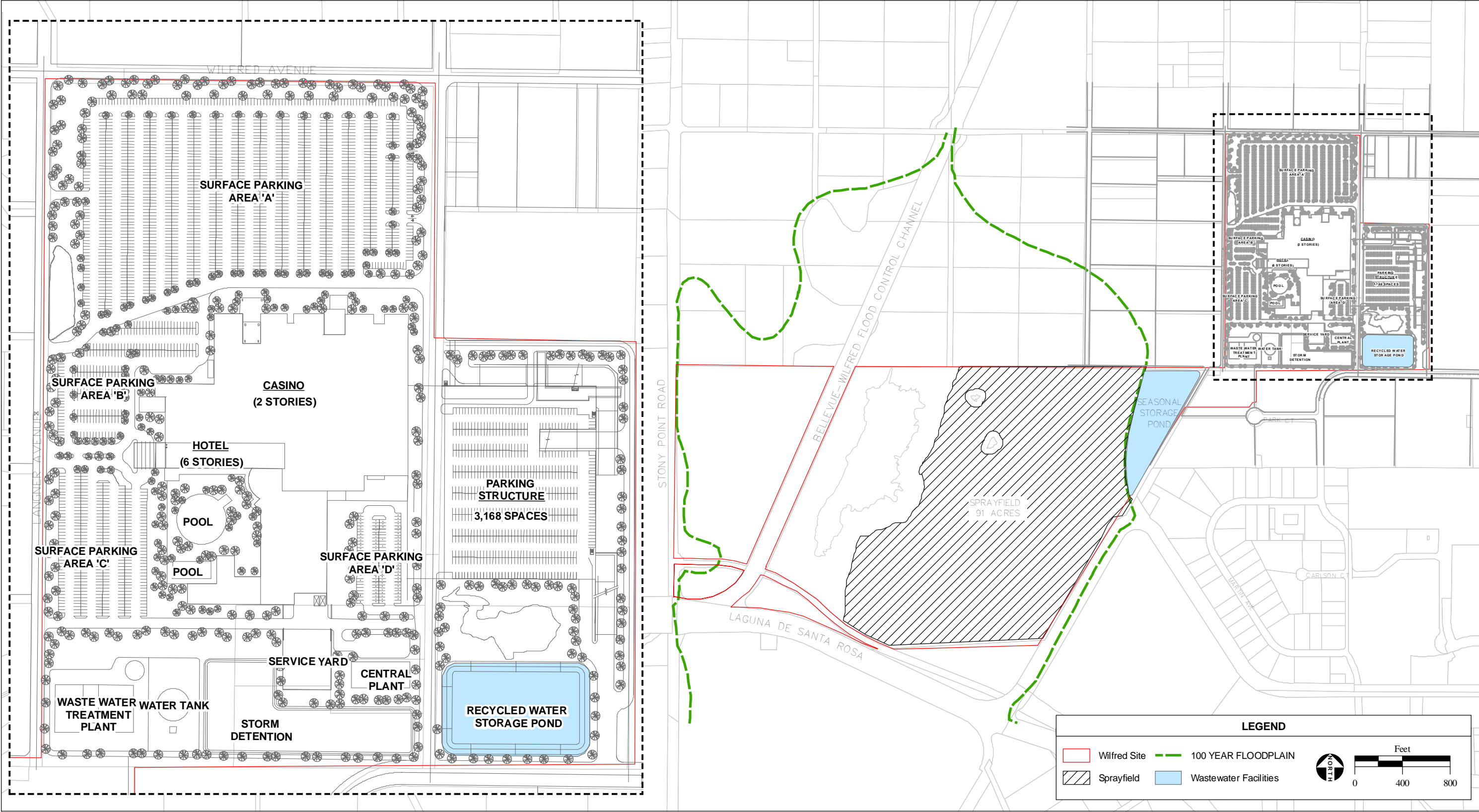
1.1 PROJECT DESCRIPTION

Variant H-sub1 consists of the NIGC's approval of a gaming management contract between the Tribe and SC Sonoma Management, LLC leading to the development of a casino-hotel resort on a portion of

approximately 252-acres of land (Wilfred Site) that is proposed to be taken into trust for the Tribe (see ROD, Attachment 1). The Wilfred Site is described in more detail in FEIS Section 1.3.

The development of Variant H-sub1 would occur on the northeast corner of the Wilfred Site. Access to the casino-hotel resort would be gained from access points at Business Park Drive and Wilfred Avenue. **Figure 1** shows the site plan for Variant H-sub1, including supporting facilities. The remainder of the Wilfred Site would remain undeveloped and be used for open space, pasture, biological habitat, and recycled water sprayfields (uses consistent with the Williamson Act restrictions currently present on the southern portion of the Wilfred Site). In response to input received from the USEPA, the Variant H-sub1 development footprint was designed with an emphasis on reduced impacts to wetlands.

Variant H-sub1 would include restaurants, a hotel, nightclub, banquet/meeting space, a pool, and spa. **Table 1** shows the breakdown of proposed uses with associated square footages for the proposed casino-hotel resort. Variant H-sub1 would be 227,400 square feet (sf) smaller than Alternative A and 121,500 sf larger than Alternative H. The primary differences between Alternatives A and H-sub1 are the smaller scale of Variant H-sub1 gaming floor (same sized gaming floor as Alternative H) and hotel (200 rooms vs. 300 rooms for Alternative A and 100 rooms for Alternative H), and the absence of a show room venue. Construction of the casino-hotel resort is estimated to directly employ 750 construction workers, while operation of is anticipated to employ an average of 2,250.



SOURCE: AES, 2009

Graton Rancheria Casino and Hotel EIS / 203523

Figure 1
Variant H -Sub 1 Site Plan

TABLE 1
VARIANT H-SUB1 – COMPONENTS

	Alternative A		Variant H-sub1		Alternative H	
Area	Seats/Rooms/ Parking Spaces	Approximate Square Footage	Seats/Rooms/ Parking Spaces	Approximate Square Footage	Seats/Rooms/ Parking Spaces	Approximate Square Footage
CASINO & ENTERTAINMENT						
<i>Casino</i>						
Casino Gaming		80,000		65,000		65,000
Casino Circulation		26,000		26,000		26,000
High Limit Gaming		5,000		5,000		5,000
Asian Gaming		3,600		3,600		3,600
Salons (2 total)		4,000		4,000		4,000
Entry Vestibules (5 total)		2,500		2,500		2,500
Restrooms (5 total)		6,000		6,000		6,000
Rewards Center		750		750		750
Cage		6,000		6,000		6,000
Back of House		70,000		55,000		55,000
Gift Shop		1,000		1,000		1,000
<i>Food and Beverage</i>						
Buffet	500 seats	23,500	500 seats	23,500	500 seats	23,500
Bars (3 total)		4,500		4,500		4,500
Service Bars (4 total)		4,000		4,000		4,000
Lease Restaurants	480 seats	20,000	480 seats	20,000	290 seats	12,000
Coffee Shop	225 seats	8,800	225 seats	8,800	225 seats	8,800
Steakhouse	200 seats	10,000	200 seats	10,000	200 seats	10,000
Food Court (6 tenants)	210 seats	12,600	210 seats	12,600	210 seats	12,600
<i>Entertainment</i>						
Nightclub		6,500		6,500		0
Show Room	1,500 seats	35,400	---	---	----	---
Lounge		8,000		8,000		8,000
<i>Banquet</i>						
Banquet Meeting Space		30,000		30,000		30,000
Pre-Function/Kitchen/Storage/Office/Support		40,000		15,000		15,000
<i>Total Casino & Related Square Footage</i>		408,150		317,750		293,250
HOTEL & SPA						
<i>Hotel</i>						
Lodging Area	300 rooms (20% suites)	291,000	200 rooms (12.5% suites)	154,000	100 rooms (10% suites)	77,000
Lobby/Bar/Back of House		13,750		13,750		13,750
Sundries		1,000		1,000		1,000
<i>Pool & Spa</i>						
Spa		20,000		20,000		0
Pool Restrooms		2,600		2,600		2,600
Pool Concessions		1,500		1,500		1,500
Pool Grill		3,000		3,000		3,000
<i>Total Hotel & Spa Square Footage</i>		332,850		195,850		98,850
CENTRAL PLANT		21,300		21,300		21,300
Total Square Footage		762,300		534,900		413,400
PARKING						
Surface Parking	4,102		2,343		2,650	
Parking Structure	2,000		3,168		2,000	
Total Parking Spaces	6,102		5,511		4,650	

SOURCE: Friedmutter Group, 2009; AES, 2009.

The Tribe would enter into a Tribal-State Compact, as required by the Indian Gaming Regulatory Act (IGRA) to govern the conduct of Class III gaming activities, or comply with procedures established by

the Secretary of the Interior (pursuant to IGRA and 25 C.F.R. 291) in the event that the State and the Tribe are unable to agree to a compact. Except for provisions related to revenues, Tribal-State Compact (or Secretarial procedures) requirements are not expected to differ from those of Alternative A (see FEIS Section 2.2).

1.1.1 MANAGEMENT CONTRACT

As with Alternative A (see FEIS Section 2.2.1), Variant H-sub1 would require NIGC approval of a management contract between the Tribe and SC Sonoma Management or its affiliates before gaming could take place on the northwest corner of the Wilfred site.

1.1.2 CASINO AND RELATED AMENITIES

The two-story casino would consist of a mixture of uses, including, banking and administrative facilities, gaming commission offices, a primary gaming area, a high-limit gaming area, and a small gift shop. Numerous food and beverage outlets would be included in the facility, including, three bars, four service bars, a 500-seat buffet, a six-vender food court, and four restaurants. The facility would also contain a night club venue and banquet/meeting space. A detailed listing of each component of the facility is contained in **Table 1**. Variant H-sub1 includes reductions from Alternative A in the size of the gaming floor, back-of-house facilities, lodging areas, and removal of the proposed show room venue.

Alcohol would be served throughout the casino, including the gaming floor. Accordingly, casino patrons would be required to be at least 21 years old, and the Tribe would adopt a “Responsible Alcoholic Beverage Policy” that would include, but not be limited to, verifying the age of patrons and refusing service to those who are visibly intoxicated. Smoking would be permitted within the casino; however, non-smoking sections would be provided.

1.1.3 HOTEL AND SPA

A 200-room, 6-story hotel tower would be located adjacent to the pool and spa area. This is a reduction from Alternative A’s proposed 300-room, 8-story hotel. A detailed listing of each hotel and spa component is provided in **Table 1**.

1.1.4 PARKING

A total of approximately 5,511 parking spaces would be provided to serve the patrons and employees of the resort and supporting facilities. A parking structure, providing 3,168 out of 5,511 parking spaces, would be located east of the casino.

1.1.5 CONSTRUCTION

The construction duration of Variant H-sub1 is estimated at 26 months. Among other activities, construction would involve earthwork; placement of concrete foundations; steel, wood and concrete

structural framing; masonry; electrical and mechanical work; building and site finishing; and paving. On site grading would follow the preliminary grading plan in FEIS Appendix C, except with a reduction in scope to account for the smaller Variant H-sub1 footprint.

Construction the gaming facility and all supporting buildings would be in accordance with standards no less stringent than those set forth in the California Building Code, including all Uniform Fire, Plumbing, Electrical, Mechanical, and related Building Codes. Construction of the facility would also comply with the best management practices (BMPs) listed in Appendix D of the Site Grading and Storm Drainage Report (reproduced in FEIS Appendix C), including BMPs for paving operations, structure construction, painting, material delivery/storage, material use, spill prevention/control, solid waste management, hazardous waste management, concrete waste management, sanitary/septic waste management, vehicle/equipment cleaning, vehicle/equipment fueling, and vehicle/equipment maintenance. In addition, construction activities would comply with all applicable federal standards, including Occupational Safety and Health Administration (OSHA) requirements and the federal Americans with Disabilities Act (P.L. 101-336, as amended, 42 U.S.C. Section 12101 *et seq.*).

1.1.6 DRAINAGE

On site drainage facilities would follow the preliminary grading and drainage plan in FEIS Appendix C, except with a reduction in scope to account for the smaller Variant H-sub1 footprint. Similar to the Alternative A preliminary grading and drainage plan, Variant H-sub1 development shall incorporate fill to elevate the proposed gaming facility sufficiently to allow stormwater to gravity flow and empty into a detention basin, located on the southwest corner of the development near Langner Avenue. The development area for Variant H-sub1 is outside of the 100-year floodplain, with all of the proposed facilities being constructed at least one foot above the 100-year floodplain elevation. Specifically, the buildings would be approximately five feet above the floodplain and the parking lot would be approximately one foot above the floodplain. It is estimated that 285,000 cubic yards of earthwork will be required for Variant H-sub1. On-site excavation adjacent to the development area would yield approximately 25,000 cubic yards of fill material. On-site excavation from the southern portion of the site would yield the remaining fill material, resulting in a “balanced” site.

Runoff from the Variant H-sub1 development would be conveyed by an underground drainage system to the detention basin, and, after filtration, to Labath Creek, which feeds into Hinebaugh Creek and then into the Laguna de Santa Rosa (**Figure 1**). Drainage patterns and on-site drainage improvements would be the same as those discussed under Alternative A in FEIS Section 2.2.6.

The grading and drainage plan incorporates two areas for storm water detention to reduce increased peak flows resulting from increased impervious surfaces to pre-project levels and to offset reduced floodplain storage caused by the development of project facilities. The first stormwater detention basin would assure that post-development runoff peaks from Variant H-sub1 would be equal to the existing conditions. Moreover, the basin would attenuate the increase in peak flow that would be generated by obtaining a

permit to release 275,000 gallons per day of tertiary treated effluent from a proposed on-site wastewater treatment plant. The detention of water on-site would reduce potential downstream erosion and effects to water quality. Approximately 14 acre-feet of storage would be provided in the stormwater detention basin to account for the increase in runoff created by increased impervious surfaces. The detention system would be located on the southern edge of the proposed casino-hotel development area (**Figure 1**).

A second storm water detention / flood storage area is proposed to be created in the southern portion of the Wilfred site (similar to the storage area in Figure 2.7 of the FEIS). This detention area will allow for additional storage area to more than account for the fill placed in the non-regulated Zone X floodplain.

1.1.7 WASTEWATER TREATMENT AND DISPOSAL

Wastewater quality issues, on-site treatment technology, and disposal options would be the same as Alternatives A and H (see FEIS Section 2.2.7). However, as explained in FEIS Section 2.11, while the FEIS provides a thorough and complete evaluation of all treatment/disposal options, only on-site treatment and sprayfield/seasonal storage disposal (wastewater option 3 for both Alternatives A and H) is a viable option at this time. Thus, only on-site treatment and disposal (through sprayfields seasonally) is discussed under Variant H-sub1. Variant H-sub1 wastewater generation rates would be 194,000 gallons per day (gpd) during average weekday flows and 273,000 gpd during weekend flows. A capacity of 300,000 gpd is anticipated for treatment. It is assumed that all effluent will be disposed upon 91-acres of sprayfields in the southern half of the Wilfred Site from April to October and stored in an 156 acre feet on-site reservoir during the remainder of the year. The sizing of the sprayfields and storage facility is in direct correlation to the decrease in wastewater flows from Alternative A estimates. A recycled water storage tank would supply the facility and landscaping with recycled water, similar to the system discussed under Alternative A in Section 2.2.7 of the FEIS.

1.1.8 WATER SUPPLY

As with Alternative A, water for domestic use, emergency supply, and fire protection would be provided by on-site wells (see FEIS Section 2.2.8). Elements of the proposed on-site water facilities include two on-site wells, an iron and manganese treatment plant, a steel water storage tank, and a water distribution pump system. As noted above in Section 1.1.7, on-site wastewater treatment and recycled water use are assumed for Variant H-sub1 (see FEIS Section 2.2.8 for more detail on recycled water uses). Based on assumptions within the Water and Wastewater Feasibility Study (Appendix D of the FEIS), the estimated average water demand would be 127 gallons per minute (gpm), with peak water demand (typically occurring on weekends) estimated at 174 gpm. These estimates are between the water demand required for Alternatives A and H. Water tank capacity would be based on fire flow requirements developed after review by local fire authorities. The estimated capacity would be approximately 1.2 million gallons stored in a welded steel tank designed to meet American Water Works Association (AWWA) specifications, similar in size to the tank recommended for Alternatives A and H in the FEIS.

Water conservation measures proposed for Alternative A (see FEIS Section 2.2.8) would also be applied to Variant H-sub1.

1.1.9 FUEL STORAGE

As for Alternative A (see FEIS Section 2.2.9), diesel fuel storage tanks would be needed for the operation of four emergency generators at the casino, one emergency generator and one fire pump for the hotel, and one emergency generator for the wastewater treatment facility. Fuel tanks would be housed above ground within the individual generator units. The largest generators would have storage tanks of approximately 1,000 gallons. Onsite fuel storage practices would be the same as for Alternative A (see FEIS Section 2.2.9).

1.1.10 MEMORANDA OF UNDERSTANDING

The Memorandum of Understanding (MOU) with the City of Rohnert Park does not apply to the Wilfred Site. In addition, given the reduced size and scope of the casino-hotel resort proposed for Variant H-sub1, as with Alternative H, the terms of the MOU are not assumed to apply to Variant H-sub1. Of course, it remains possible to modify the MOU with the City for the reduced intensity development. We assume that the Sonoma County MOU, which is applicable to the Wilfred Site, would apply to Variant H-sub1. The project labor agreements with the Sonoma, Lake and Mendocino County Building and Construction Trades Council and with the Hotel Employees and Restaurant Employees International Union, AFL-CIO would also apply to Variant H-sub1.

1.2 ENVIRONMENTAL CONSEQUENCES

1.2.1 INTRODUCTION

As noted above, the Variant H-sub1 components and overall size of the facilities falls in between Alternatives A and H, as described in the FEIS. Therefore the environmental impacts from Variant H-sub1 must necessarily also fall in between the environmental impact reported in Section 4.0 of the FEIS for Alternatives A and H. Nonetheless, in the interest of public disclosure and in order to ensure mitigation measures in Section 6.0 of the ROD are applicable to Variant H-sub1, an additional analysis of the environmental consequences is included below.

1.2.2 LAND RESOURCES

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to land resources, including impacts to topography, mineral resources, soils, and seismicity would fall in between the impacts of Alternatives A and H (see FEIS Section 4.2). Thus, less than significant impacts to topography and mineral resources under Alternatives A and H would also be less than significant under Variant H-sub1. Potentially significant soils and seismicity impacts under Alternatives A and H would also be potentially significant under Variant H-

sub1. Mitigation measures contained in ROD Section 6.1 would reduce these impacts to a less than significant level.

1.2.3 WATER RESOURCES

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to water resources, including impacts to surface water and groundwater would fall in between the impacts of Alternatives A and H (see FEIS Section 4.3). For instance, water demand would be an average of 127 gpm for Variant H-sub1, compared to 165 gpm and 115 gpm for Alternatives A and H. Thus, significant surface water and groundwater impacts under Alternatives A and H would also be significant under Variant H-sub1. Mitigation measures contained in the ROD Section 6.2 would reduce these impacts to a less than significant level.

1.2.4 AIR QUALITY

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to air quality, including construction and operational pollutant emissions, odor impacts, toxic air contaminant (TAC) impacts, impacts to Federal Class I Areas, and indoor air quality impacts, would fall in between the impacts of Alternatives A and H (see FEIS Section 4.4). Thus, less than significant construction pollutant emissions, odor, TAC, and Federal Class I Area impacts under Alternatives A and H would also be less than significant under Variant H-sub1. Potentially significant operational pollutant emissions and indoor air quality impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. For instance, Nitrogen Oxide (NO_x) emissions would be 135.53 tons per year (tpy) for Variant H-sub1, as compared to 156 tpy and 109 tpy for Alternatives A and H. Other Variant H-sub1 operational emissions are estimated in **Table 2**. Detailed emissions model results are contained in Attachment 4 to this ROD. Mitigation measures contained in the ROD Section 6.3 would reduce these impacts to a less than significant level.

Conformity

As with Alternatives A and H, Variant H-sub1 exceeds the conformity *de minimis* thresholds for NO_x and Carbon Monoxide (CO). A Conformity Determination was conducted for NO_x and CO to determine further requirements and is shown in Appendix W of the FEIS. It was determined that conformity requirements are met for CO emissions under Alternative A and therefore, would be met for Variant H-sub1, warranting no further action. It was determined that 149 tpy of NO_x emissions would have to be fully offset with emissions credits (effectively lowering NO_x emissions to zero) for Alternative A to be in conformity with the applicable State Implementation Plan (SIP). The Tribe entered into an agreement to purchase 149 tons of NO_x credits (see FEIS Appendix W). The purchase of 149 tons of NO_x credits would more than fully offset Variant H-sub1 emissions; therefore, conforming to the applicable SIP.

TABLE 2
UNMITIGATED OPERATION EMISSIONS – VARIANT H-SUB1

Sources	ROG	NO _x	PM ₁₀	PM _{2.5} ¹
	tpy	tpy	tpy	tpy
Area	0.56	0.73	0.00	0.00
Mobile	73.62	122.49	143.04	141.89
Total Emissions	74.18	126.24	143.04	141.89
<i>Conformity Threshold</i>	<i>100</i>	<i>100</i>	<i>N/A</i>	<i>N/A</i>
Exceeds Conformity Threshold	No	Yes	N/A	N/A
<i>BAAQMD Threshold</i>	<i>15</i>	<i>15</i>	<i>15</i>	<i>N/A</i>
Exceeds BAAQMD Threshold	Yes	Yes	Yes	N/A

Note: tpy = tons per year. N/A = Not Applicable

¹ CARB speciation profile shows that 99.2% of PM₁₀ is PM_{2.5} for gasoline powered engine emissions and 92.0% for diesel powered engine emissions. 99.2% is assumed here for a conservative analysis. See ROD Attachment 7 for a technical memorandum demonstrating the conservative nature of this assumption.

Source: URBEMIS, 2007.

1.2.5 BIOLOGICAL RESOURCES

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H. Therefore, Variant H-sub1's impacts to habitats, special status species, and waters of the U.S. would fall in between the impacts of Alternatives A and H (see FEIS Section 4.2). Thus, potentially significant impacts to wildlife and habitats, federally listed species, and waters of the U.S. under Alternatives A and H would also be potentially significant under Variant A-sub1. For instance, the development of Variant H-sub1 would result in impacts to 81.13 acres of CTS aestivation habitat (see ROD Attachment 4). Also, approximately 0.55 acres of seasonal pools and wetlands, and 0.36 acres of drainages would be graded and filled by construction of the on-site WWTP (see ROD Attachment 4). As shown in **Table 3**, Variant H-sub1 would result in substantially lower impacts to wetlands than even Alternative H due to the rearrangement of on-site facilities to avoid wetland impacts. Mitigation measures contained in ROD Section 6.4 would reduce these impacts to a less than significant level.

TABLE 3
WETLAND COMPARISONS- ALTERNATIVES A, H, AND VARIANT H-SUB1

	Alternative A	Variant H-sub1	Alternative H
Wetland Feature	Acreage Affected		
Seasonal Ponds and Wetlands	1.60	0.55	1.49
Drainage Ditches	0.77	0.36	0.48
Total	2.37	0.91	1.97

Source: The Huffman-Broadway Group, Inc., 2007; AES, 2009

1.2.6 CULTURAL AND PALEONTOLOGICAL RESOURCES

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to cultural and paleontological resources would fall in between the impacts of Alternatives A and H (see FEIS Section 4.6). Thus, potentially significant cultural and paleontological impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. Mitigation measures contained in the ROD Section 6.5 would reduce these impacts to a less than significant level.

1.2.7 SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to socioeconomic conditions and environmental justice would fall in between the impacts of Alternatives A and H (see FEIS Section 4.7). Thus, beneficial direct, indirect, and induced economic impacts under Alternatives A and H would also be beneficial under Variant H-sub1. For instance, Variant H-sub1 is expected to employ 750 workers during construction (the same as Alternatives A and H) and 2,250 workers during operation (as compared to 2,400 workers on average for Alternative A and 2,100 workers for Alternative H). Less than significant substitution, property values, and environmental justice impacts under Alternatives A and H would also be less than significant under Variant H-sub1. Potentially significant fiscal impacts to local jurisdictions and social impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. For instance, fiscal impacts to Sonoma County would be \$157,500 pursuant to the fiscal impact methodology described in FEIS Appendix N (this is compared to \$167,745 on average for Alternative A and \$146,777 for Alternative H). Mitigation measures contained in the ROD Section 6.6 would reduce fiscal and social impacts to a less than significant level.

1.2.8 RESOURCE USE PATTERNS

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to resource use patterns, including impacts to

transportation/circulation, land use, and agriculture would fall in between the impacts of Alternatives A and H (see FEIS Section 4.8). Thus, less than significant impacts to land use and agriculture under Alternatives A and H would also be less than significant under Variant H-sub1. Potentially significant transportation/circulation impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. For instance, as reported in a revised traffic impact study (see ROD Attachment 4), Variant H-sub1 would generate 14,724 daily vehicle trips, as compared to 18,261 daily trips for Alternative A and 12,696 daily trips for Alternative H. Mitigation measures contained in the ROD Section 6.7 would reduce these impacts to a less than significant level.

1.2.9 PUBLIC SERVICES

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to public services, including impacts to water supply; wastewater; solid waste; electricity, natural gas, and telecommunications; public health and safety; and schools would fall in between the impacts of Alternatives A and H (see FEIS Section 4.9). Thus, less than significant impacts to water supply; wastewater; solid waste; electricity, natural gas, and telecommunications; and schools under Alternatives A and H would also be less than significant under Variant H-sub1. Potentially significant public health and safety impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. Mitigation measures contained in the ROD Sections 6.6 and 6.8 would reduce these impacts to a less than significant level.

1.2.10 OTHER VALUES

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts to other values, including noise, hazardous materials, and visual resources impacts, would fall in between the impacts of Alternatives A and H (see FEIS Section 4.10). Thus, less than significant impacts to visual resources under Alternatives A and H would also be less than significant under Variant H-sub1. For instance, the Variant H-sub1 parking garage would be 6 stories, as compared to 8 stories for Alternative A and 5 stories for Alternative H. Potentially significant noise and hazardous materials impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. Mitigation measures contained in the ROD Sections 6.9 and 6.10 would reduce these impacts to a less than significant level.

1.2.11 INDIRECT AND GROWTH INDUCING EFFECTS

GROWTH INDUCING EFFECTS

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's potential to induce growth due to the development of the proposed facilities

or related improvements to infrastructure and utilities would be in between the potential created by Alternatives A and H (see FEIS Section 4.11). As noted in FEIS Section 4.11, neither Alternative A nor Alternative H (or any infrastructure/utilities associated with Alternatives A or H) would have any growth inducing effects. Thus, Variant H-sub1 would also not result in any growth inducing effects.

INDIRECT EFFECTS FROM OFF-SITE CONSTRUCTION

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's impacts and recommended off-site traffic improvements to mitigate traffic impacts would fall in between the impacts and recommended off-site traffic improvements for Alternatives A and H (see FEIS Sections 4.8, 4.12, 5.2.7, Appendix O and ROD Section 6.7 and Attachment 4). Thus, less than significant indirect impacts from the off-site construction of roadway/intersection improvements less than significant impacts to topography and mineral resources under Alternatives A and H would also be less than significant under Variant H-sub1.

Although only on-site wastewater treatment is a viable option at this time, note that off-site sewer pipeline construction would not differ between Alternatives A, H, and H-sub1.

1.2.12 CUMULATIVE EFFECTS

The development footprint, development components, and the size of the development under Variant H-sub1 would be in between that of Alternatives A and H, as described above and in FEIS Section 2.0. Therefore, Variant H-sub1's cumulative impacts would fall in between the impacts of Alternatives A and H (see FEIS Section 4.12.3). Thus, less than significant impacts to land resources and water resources under Alternatives A and H would also be less than significant under Variant H-sub1. Potentially significant air quality, biological resources, cultural resources, socioeconomic conditions, resources use patterns, public services, and other values impacts under Alternatives A and H would also be potentially significant under Variant H-sub1. For instance, Nitrogen Oxide (NO_x) emissions would be 44.31 tons per year (tpy) for Variant H-sub1, as compared to 54 tpy and 37 tpy for Alternatives A and H. Other Variant H-sub1 cumulative criteria pollutant and greenhouse gas emissions are estimated in **Tables 5 and 6**. Mitigation measures contained in the ROD Section 6.0 would reduce potentially significant cumulative impacts to a less than significant level.

TABLE 5
UNMITIGATED CUMULATIVE OPERATION EMISSIONS – VARIANT H-SUB1

Sources	ROG	NOx	PM ₁₀	PM _{2.5} ¹
	tpy	tpy	tpy	tpy
Area	0.06	0.47	0.00	0.00
Mobile	26.29	46.08	123.45	122.462
Total Emissions	26.35	44.31	123.45	122.462
<i>BAAQMD Threshold</i>	15	15	15	N/A
Exceeds BAAQMD Threshold	Yes	Yes	Yes	N/A

Note: tpy = tons per year. N/A = Not Applicable

¹ CARB speciation profile shows that 99.2% of PM₁₀ is PM_{2.5} for gasoline powered engine emissions and 92.0% for diesel powered engine emissions. 99.2% is assumed here for a conservative analysis. See ROD Attachment 7 for a technical memorandum demonstrating the conservative nature of this assumption.

Source: URBEMIS, 2007.

TABLE 6
ESTIMATED VARIANT H-SUB1 OPERATIONAL GHG EMISSIONS

CO ₂ Emissions ¹					
Mobile Sources		Area Sources		Total CO ₂ e	
tpy		tpy		tpy	
70,704		701		71,405	
CH ₄ and N ₂ O Emission from Mobile Sources ²					
Emission Factor (CH ₄ /N ₂ O)	Miles Traveled	CH ₄	N ₂ O	Total CO ₂ e	
g/mile	miles/day	tpy	tpy	tpy	
0.05/0.05	491,791	9.2	9.2	3,045	
Indirect GHG emissions ²					
Emission Factor (Kg of CO ₂ /CH ₄ /N ₂ O)	Estimated kW-h Usage ³	CO ₂	CH ₄	N ₂ O	Indirect CO ₂ e
lb/MW-h	MW-h/year		tons per year		
804.54/0.006/0.0037	49	10	0.0	0.0	10
Total Operation CO ₂ e tons per year					74,460

¹ Estimated from EPA and CARB approved URBEMIS 2007 air quality program; tpy = tons per year.

² Emission factors from Climate Change Action Registry

³ Estimated using 4,500 kilowatts-hours/month of power used.

Source: URBEMIS, 2007; Climate Change Action Registry, 2007.

ATTACHMENT 4

Variant H-sub1 Technical Studies

Air Quality

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Near Term
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.51	2.57	3.60	0.00	0.01
TOTALS (lbs/day, mitigated)	0.42	2.06	2.88	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	328.18	632.49	5,535.19	3.84	678.75
TOTALS (lbs/day, mitigated)	313.76	604.23	5,287.36	3.67	648.43

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	328.69	635.07	5,538.78	3.84	678.76
TOTALS (lbs/day, mitigated)	314.18	606.29	5,290.24	3.67	648.44

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Near Term
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.07	0.47	0.52	0.00	0.00
TOTALS (tpy, mitigated)	0.06	0.38	0.42	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	67.16	135.06	1,024.68	0.70	123.87
TOTALS (tpy, mitigated)	64.18	129.02	978.80	0.67	118.34

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	67.22	135.53	1,025.20	0.70	123.87
TOTALS (tpy, mitigated)	64.24	129.40	979.22	0.67	118.34

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Near Term
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.19	2.57	2.16	0	0.00
Hearth - No summer emissions					
Landscaping	0.22	0.01	1.44	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.10	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.51	2.57	3.60	0.00	0.01

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Mitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.15	2.05	1.72	0	0.00
Hearth - No summer emissions					
Landscaping	0.18	0.01	1.15	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.10	-	-	-	-
TOTALS (lbs/day, mitigated)	0.42	2.06	2.88	0.00	0.01

Area Source Mitigation Measures

Residential Increase Efficiency Beyond Title 24
Percent Reduction: 20
Commercial Increase Efficiency Beyond Title 24
Percent Reduction: 20
Industrial Increase Efficiency Beyond Title 24
Percent Reduction: 20
Residential Electric Landscape Maintenance Equipment
Percent Reduction: 20
Commercial/Industrial Electric Landscape Maintenance Equipment
Percent Reduction: 20

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Casino	313.83	609.12	5,330.68	3.70	653.67
Hotel	14.35	23.37	204.51	0.14	25.08
TOTAL EMISSIONS (lbs/day)	328.18	632.49	5,535.19	3.84	678.75

Includes correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2008 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Casino		39.43 trips/1000 sq. ft.	359.62	14,179.82
Hotel		2.72 trips/rooms	200.00	544.00
Sum of Total Trips				14,723.82
Total Vehicle Miles Traveled				448,407.39

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.00	1.60	98.00	0.40
Light Truck < 3,750 lbs	15.00	2.70	95.30	2.00
Light Truck 3,751- 5,750	16.20	1.20	97.50	1.30
Med Truck 5,751- 8,500	7.20	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.70	76.50	23.50	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	35.5	35.5	11.8	35.5	35.5
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	35.5	35.5
Trip Speeds (mph)	30.0	50.0	50.0	30.0	50.0	50.0
% of Trips - Residential	27.3	21.2	51.5			

% of Trips - Commercial (by land use)

Casino	5.0	2.5	92.5
Hotel	5.0	2.5	92.5

MITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Casino	299.94	581.91	5,092.01	3.53	624.47
Hotel	13.81	22.32	195.35	0.14	23.96
TOTAL EMISSIONS (lbs/day)	313.76	604.23	5,287.36	3.67	648.43
PERCENTAGE REDUCTION %	4	4	4	4	4

Includes correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2008 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Casino (Worker Trip Rate: 36.81)		37.68 trips/1000 sq. ft.	359.62	13,551.76
Hotel (Worker Trip Rate: 2.54)		2.60 trips/rooms	200.00	519.90
Sum of Total Trips				14,071.66
Total Vehicle Miles Traveled				428,376.55

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.00	1.60	98.00	0.40
Light Truck < 3,750 lbs	15.00	2.70	95.30	2.00
Light Truck 3,751- 5,750	16.20	1.20	97.50	1.30
Med Truck 5,751- 8,500	7.20	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.70	76.50	23.50	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	35.5	35.5	11.8	35.5	35.5
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	35.5	35.5
Trip Speeds (mph)	30.0	50.0	50.0	30.0	50.0	50.0
% of Trips - Residential	27.3	21.2	51.5			

% of Trips - Commercial (by land use)

Casino	5.0	2.5	92.5
Hotel	5.0	2.5	92.5

MITIGATION OPTIONS SELECTED

Non-Residential Mitigation Measures

=====

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 0.25%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 24

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 2.18%

Inputs Selected:

The Number of Intersections per Square Mile is 100

The Percent of Streets with Sidewalks on One Side is 50%

The Percent of Streets with Sidewalks on Both Sides is 10%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 30%

Non-Residential Free Transit Passes Mitigation

Percent Reduction in Trips is 0.06%

Note that the above percent is applied ONLY to worker trips.

Inputs Selected:

The Free Transit Passes checkbox was selected.

Non-Residential Other Transportation Demand Measures Mitigation

Percent Reduction in Trips is 2.24%

Note that the above percent is applied ONLY to worker trips.

Inputs Selected:

The 'Showers/Changing Facilities Provided' measure was selected

The 'Guaranteed Ride Home Program Provided' measure was selected

The 'Information provided on Transportation Alternatives' measure was selected

The 'Dedicated Employee Transportation Coordinator' measure was selected

The 'Carpool Matching Programs' measure was selected

The 'Preferential Carpool/Vanpool Parking' measure was selected

Changes made to the default values for Land Use Trip Percentages

The Primary Trip % for Blank changed from 90 to 85
The Diverted Trip % for Blank changed from 10 to 15
The Primary Trip % for Hotel changed from 60 to 85
The Diverted Trip % for Hotel changed from 35 to 15
The Pass-By Trip % for Hotel changed from 5 to 0

Changes made to the default values for Area

The hearth option switch changed from on to off.
The area source mitigation measure option switch changed from off to on.
The landscape year changed from 2005 to 2007.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.0013.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.0013.
Mitigation measure Residential Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Commercial Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Industrial Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Residential Electric Landscape Maintenance Equipment
has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment
has been changed from off to on.

Changes made to the default values for Operations

The mitigation option switch changed from off to on.
The operational emission year changed from 2005 to 2008.
The home based work selection item changed from 7 to 6.
The home based shopping trip speed changed from 30 to 50.
The home based shopping selection item changed from 7 to 10.
The home based shopping urban trip length changed from 4.6 to 35.5.
The home based other trip speed changed from 30 to 50.
The home based other selection item changed from 7 to 10.
The home based other urban trip length changed from 6.1 to 35.5.
The commercial based commute selection item changed from 7 to 6.
The commercial based non-work trip speed changed from 30 to 50.
The commercial based non-work selection item changed from 7 to 10.
The commercial based non-work urban trip length changed from 5.0 to 35.5.
The commercial based non-work rural trip length changed from 10 to 35.5.
The commercial based customer trip speed changed from 30 to 50.
The commercial based customer selection item changed from 7 to 10.
The commercial based customer urban trip length changed from 5.0 to 35.5.
The commercial based customer rural trip length changed from 10 to 35.5.
The Res and Non-Res Local-Serving Retail Mitigation changed from off to on.
The Res and Non-Res Transit Service Mitigation changed from off to on.
The Res and Non-Res Ped/Bike Mitigation changed from off to on.
The Res and Non-Res Trans Demand Mgmt Measures Mitigation changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Long Term
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.46	2.59	3.42	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	128.84	215.83	2,095.00	3.82	676.45

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	129.30	218.42	2,098.42	3.82	676.46

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Long Term
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	0.06	0.47	0.51	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	26.29	46.08	384.93	0.69	123.45

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	26.35	46.55	385.43	0.69	123.45

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Long Term
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.19	2.57	2.16	0	0.00
Hearth - No summer emissions					
Landscaping	0.18	0.02	1.26	0.00	0.00
Consumer Products	0.00	-	-	-	-
Architectural Coatings	0.10	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.46	2.59	3.42	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Casino	122.84	207.86	2,017.60	3.68	651.46
Hotel	6.00	7.97	77.40	0.14	24.99
TOTAL EMISSIONS (lbs/day)	128.84	215.83	2,095.00	3.82	676.45

Includes correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2020 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Casino		39.43 trips/1000 sq. ft.	359.62	14,179.82
Hotel		2.72 trips/rooms	200.00	544.00
Sum of Total Trips				14,723.82
Total Vehicle Miles Traveled				448,407.39

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.40	0.40	99.40	0.20
Light Truck < 3,750 lbs	15.30	0.70	98.00	1.30
Light Truck 3,751- 5,750	16.40	0.60	98.80	0.60
Med Truck 5,751- 8,500	7.30	0.00	98.60	1.40
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.80	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	50.00	50.00	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.50	0.00	93.30	6.70

Travel Conditions

	Residential			Commercial		
	Home- Work	Home- Shop	Home- Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	35.5	35.5	11.8	35.5	35.5
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	35.5	35.5
Trip Speeds (mph)	30.0	50.0	50.0	30.0	50.0	50.0
% of Trips - Residential	27.3	21.2	51.5			

% of Trips - Commercial (by land use)

Casino	5.0	2.5	92.5
Hotel	5.0	2.5	92.5

Changes made to the default values for Land Use Trip Percentages

The Primary Trip % for Blank changed from 90 to 85
The Diverted Trip % for Blank changed from 10 to 15
The Primary Trip % for Hotel changed from 60 to 85
The Diverted Trip % for Hotel changed from 35 to 15
The Pass-By Trip % for Hotel changed from 5 to 0

Changes made to the default values for Area

The hearth option switch changed from on to off.
The landscape year changed from 2005 to 2020.
The residential Arch. Coatings ROG emission factor changed from 0.0185 to 0.0013.
The nonresidential Arch. Coatings ROG emission factor changed from 0.0185 to 0.0013.
Mitigation measure Commercial Increase Efficiency Beyond Title 24
has been changed from off to on.
Mitigation measure Commercial/Industrial Electric Landscape Maintenance Equipment
has been changed from off to on.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2020.
The home based work selection item changed from 7 to 6.
The home based shopping trip speed changed from 30 to 50.
The home based shopping selection item changed from 7 to 10.
The home based shopping urban trip length changed from 4.6 to 35.5.
The home based other trip speed changed from 30 to 50.
The home based other selection item changed from 7 to 10.
The home based other urban trip length changed from 6.1 to 35.5.
The commercial based commute selection item changed from 7 to 6.
The commercial based non-work trip speed changed from 30 to 50.
The commercial based non-work selection item changed from 7 to 10.
The commercial based non-work urban trip length changed from 5.0 to 35.5.
The commercial based non-work rural trip length changed from 10 to 35.5.
The commercial based customer trip speed changed from 30 to 50.
The commercial based customer selection item changed from 7 to 10.
The commercial based customer urban trip length changed from 5.0 to 35.5.
The commercial based customer rural trip length changed from 10 to 35.5.

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Constuction
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	26.73	193.02	211.86	0.05	55.56	7.43	48.13
*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	38.42	120.83	172.68	0.00	4.83	4.42	0.41
*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	7.64	45.84	62.58	0.00	1.48	1.47	0.01

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Construction
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMPAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

CONSTRUCTION EMISSION ESTIMATES

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	1.75	12.41	13.67	0.00	3.23	0.50	2.73
*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	2.41	11.25	15.13	0.00	0.47	0.43	0.04
*** 2009 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	0.16	1.00	1.37	0.00	0.03	0.03	0.00

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\Graton V3\Graton Variant H-Sub1\Gr
Project Name: Graton Variant H-Sub1 - Constuction
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: June, 2007
Construction Duration: 27
Total Land Use Area to be Developed: 56 acres
Maximum Acreage Disturbed Per Day: 4.8 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 459628

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	7.09	-	7.09
Off-Road Diesel	10.75	79.71	81.01	-	3.45	3.45	0.00
On-Road Diesel	1.42	20.44	5.27	0.04	0.70	0.60	0.10
Worker Trips	0.06	0.10	1.73	0.00	0.01	0.00	0.01
Maximum lbs/day	12.23	100.25	88.01	0.04	11.25	4.05	7.20
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	48.00	-	48.00
Off-Road Diesel	25.06	165.65	204.75	-	6.76	6.76	0.00
On-Road Diesel	1.57	27.31	5.86	0.05	0.78	0.67	0.11
Worker Trips	0.10	0.06	1.25	0.00	0.02	0.00	0.02
Maximum lbs/day	26.73	193.02	211.86	0.05	55.56	7.43	48.13
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.62	76.09	81.91	-	3.19	3.19	0.00
Bldg Const Worker Trips	1.11	0.68	14.31	0.00	0.21	0.01	0.20
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	11.73	76.76	96.21	0.00	3.40	3.20	0.20
Max lbs/day all phases	26.73	193.02	211.86	0.05	55.56	7.43	48.13

*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.62	72.88	83.96	-	2.88	2.88	0.00
Bldg Const Worker Trips	1.02	0.63	13.33	0.00	0.21	0.01	0.20
Arch Coatings Off-Gas	18.11	-	-	-	-	-	-
Arch Coatings Worker Trips	1.02	0.63	13.33	0.00	0.21	0.01	0.20
Asphalt Off-Gas	0.15	-	-	-	-	-	-
Asphalt Off-Road Diesel	7.41	46.00	61.26	-	1.50	1.50	0.00
Asphalt On-Road Diesel	0.04	0.66	0.14	0.00	0.02	0.02	0.00
Asphalt Worker Trips	0.05	0.03	0.66	0.00	0.01	0.00	0.01
Maximum lbs/day	38.42	120.83	172.68	0.00	4.83	4.42	0.41
Max lbs/day all phases	38.42	120.83	172.68	0.00	4.83	4.42	0.41

*** 2009***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.15	-	-	-	-	-	-
Asphalt Off-Road Diesel	7.41	45.21	61.84	-	1.46	1.46	0.00
Asphalt On-Road Diesel	0.04	0.60	0.13	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.05	0.03	0.60	0.00	0.01	0.00	0.01
Maximum lbs/day	7.64	45.84	62.58	0.00	1.48	1.47	0.01

Max lbs/day all phases	7.64	45.84	62.58	0.00	1.48	1.47	0.01
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Phase 1 - Demolition Assumptions

Start Month/Year for Phase 1: Jun '07
Phase 1 Duration: 1.0 months
Building Volume Total (cubic feet): 85540
Building Volume Daily (cubic feet): 16875
On-Road Truck Travel (VMT): 936
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
2	Rubber Tired Dozers	352	0.590	8.0
1	Rubber Tired Loaders	165	0.465	8.0

Phase 2 - Site Grading Assumptions

Start Month/Year for Phase 2: Jul '07
Phase 2 Duration: 5 months
On-Road Truck Travel (VMT): 1041.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Crawler Tractors	143	0.575	8.0
3	Graders	174	0.575	8.0
1	Off Highway Trucks	417	0.490	8.0
2	Other Equipment	190	0.620	8.0
1	Rubber Tired Loaders	165	0.465	8.0
2	Scrapers	313	0.660	8.0
3	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Dec '07
Phase 3 Duration: 21 months
Start Month/Year for SubPhase Building: Dec '07
SubPhase Building Duration: 13 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Concrete/Industrial saws	84	0.730	8.0
1	Cranes	190	0.430	8.0
2	Other Equipment	190	0.620	8.0
2	Rough Terrain Forklifts	94	0.475	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Start Month/Year for SubPhase Architectural Coatings: Sep '08

SubPhase Architectural Coatings Duration: 3 months

Start Month/Year for SubPhase Asphalt: Oct '08

SubPhase Asphalt Duration: 5 months

Acres to be Paved: 6.4

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
3	Rollers	114	0.430	8.0

Changes made to the default values for Land Use Trip Percentages

The Primary Trip % for Blank changed from 90 to 100
The Diverted Trip % for Blank changed from 10 to 0
The Primary Trip % for Hotel changed from 60 to 100
The Diverted Trip % for Hotel changed from 35 to 0
The Pass-By Trip % for Hotel changed from 5 to 0
The Primary Trip % for Office park changed from 80 to 100
The Diverted Trip % for Office park changed from 15 to 0
The Pass-By Trip % for Office park changed from 5 to 0

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Site Grading Truck Haul Capacity (yds3) changed from 20 to 12
Site Grading Miles/Round Trip changed from 20 to 5
Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.0013
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.0013
Phase 2 mitigation measure Soil Disturbance: Apply soil stabilizers to inactive areas
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Replace ground cover in disturbed areas quickly
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
has been changed from off to on.

Page: 1

5/12/2009 3:45:09 PM

Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\equinn\Application Data\Urbemis\Version9a\Projects\Graton H-Sub 1\Graton - Variant H-Sub1.urb924

Project Name: Graton - Variant H-Sub1

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

CO2

2007 TOTALS (tons/year unmitigated)	730.51
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2007 TOTALS (tons/year mitigated)	730.51
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Percent Reduction	0.00
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2008 TOTALS (tons/year unmitigated)	1,322.34
-------------------------------------	----------

2008 TOTALS (tons/year mitigated)	1,322.34
-----------------------------------	----------

Percent Reduction	0.00
-------------------	------

2009 TOTALS (tons/year unmitigated)	555.03
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2009 TOTALS (tons/year mitigated)	555.03
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Percent Reduction	0.00
-------------------	------

Page: 2

5/12/2009 3:45:09 PM

AREA SOURCE EMISSION ESTIMATES

CO2

TOTALS (tons/year, unmitigated)	875.96
TOTALS (tons/year, mitigated)	700.87
Percent Reduction	19.99

OPERATIONAL (VEHICLE) EMISSION
ESTIMATES

CO2

TOTALS (tons/year, unmitigated)	72,443.31
TOTALS (tons/year, mitigated)	70,704.09
Percent Reduction	2.40

SUM OF AREA SOURCE AND OPERATIONAL EMISSION
ESTIMATES

CO2

TOTALS (tons/year, unmitigated)	73,319.27
TOTALS (tons/year, mitigated)	71,404.96
Percent Reduction	2.61

5/12/2009 3:45:42 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\equinn\Application Data\Urbemis\Version9a\Projects\Graton H-Sub 1\Graton - Variant H-Sub1.urb924

Project Name: Graton - Variant H-Sub1

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

CO2

2007 TOTALS (lbs/day unmitigated) 17,542.56

2007 TOTALS (lbs/day mitigated) 17,542.56

2008 TOTALS (lbs/day unmitigated) 10,094.21

2008 TOTALS (lbs/day mitigated) 10,094.21

2009 TOTALS (lbs/day unmitigated) 11,835.16

2009 TOTALS (lbs/day mitigated) 11,835.16

AREA SOURCE EMISSION ESTIMATES

CO2

TOTALS (lbs/day, unmitigated) 4,802.58

TOTALS (lbs/day, mitigated) 3,843.19

Percent Reduction 19.98

Page: 2

5/12/2009 3:45:42 PM

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

CO2

TOTALS (lbs/day, unmitigated)	417,413.05
TOTALS (lbs/day, mitigated)	407,391.78
Percent Reduction	2.40

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

CO2

TOTALS (lbs/day, unmitigated)	422,215.63
TOTALS (lbs/day, mitigated)	411,234.97
Percent Reduction	2.60

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

CO2

Time Slice 6/1/2007-6/14/2007 Active Days: 10	3,294.71
Demolition 06/01/2007- 06/30/2007	3,294.71
Fugitive Dust	0.00
Demo Off Road Diesel	2,281.38
Demo On Road Diesel	862.48
Demo Worker Trips	150.84

Page: 3

5/12/2009 3:45:42 PM

Time Slice 6/15/2007-6/29/2007 10,012.46
Active Days: 11

Demolition 06/01/2007- 3,294.71
06/30/2007

Fugitive Dust 0.00

Demo Off Road Diesel 2,281.38

Demo On Road Diesel 862.48

Demo Worker Trips 150.84

Mass Grading 06/15/2007- 6,717.76
09/01/2007

Mass Grading Dust 0.00

Mass Grading Off Road Diesel 3,007.48

Mass Grading On Road Diesel 3,559.44

Mass Grading Worker Trips 150.84

Time Slice 7/2/2007-8/14/2007 6,717.76
Active Days: 32

Mass Grading 06/15/2007- 6,717.76
09/01/2007

Mass Grading Dust 0.00

Mass Grading Off Road Diesel 3,007.48

Mass Grading On Road Diesel 3,559.44

Mass Grading Worker Trips 150.84

Page: 4

5/12/2009 3:45:42 PM

Time Slice 8/15/2007-8/31/2007 17,542.56
Active Days: 13

Fine Grading 08/15/2007-
09/15/2007 10,824.80

Fine Grading Dust 0.00

Fine Grading Off Road Diesel 3,007.48

Fine Grading On Road Diesel 7,666.48

Fine Grading Worker Trips 150.84

Mass Grading 08/15/2007-
09/01/2007 6,717.76

Mass Grading Dust 0.00

Mass Grading Off Road Diesel 3,007.48

Mass Grading On Road Diesel 3,559.44

Mass Grading Worker Trips 150.84

Time Slice 9/3/2007-9/14/2007 10,824.80
Active Days: 10

Fine Grading 08/15/2007-
09/15/2007 10,824.80

Fine Grading Dust 0.00

Fine Grading Off Road Diesel 3,007.48

Fine Grading On Road Diesel 7,666.48

Fine Grading Worker Trips 150.84

Time Slice 9/17/2007-10/5/2007 10,061.72
Active Days: 15

Building 09/15/2007-05/15/2009 10,061.72

Building Off Road Diesel 3,197.75

Building Vendor Trips 3,314.23

Building Worker Trips 3,549.74

Page: 5

5/12/2009 3:45:42 PM

Time Slice 10/8/2007-12/31/2007 10,093.97
Active Days: 61

Building 09/15/2007-05/15/2009 10,061.72

Building Off Road Diesel 3,197.75

Building Vendor Trips 3,314.23

Building Worker Trips 3,549.74

Coating 10/08/2007-05/31/2009 32.25

Architectural Coating 0.00

Coating Worker Trips 32.25

Time Slice 1/1/2008-12/31/2008 10,094.21
Active Days: 262

Building 09/15/2007-05/15/2009 10,061.97

Building Off Road Diesel 3,197.75

Building Vendor Trips 3,314.35

Building Worker Trips 3,549.87

Coating 10/08/2007-05/31/2009 32.25

Architectural Coating 0.00

Coating Worker Trips 32.25

Page: 6

5/12/2009 3:45:42 PM

Time Slice 1/1/2009-2/13/2009	10,095.72
Active Days: 32	
Building 09/15/2007-05/15/2009	10,063.46
Building Off Road Diesel	3,197.75
Building Vendor Trips	3,314.38
Building Worker Trips	3,551.33
Coating 10/08/2007-05/31/2009	32.26
Architectural Coating	0.00
Coating Worker Trips	32.26
Time Slice 2/16/2009-5/15/2009	<u>11,835.16</u>
Active Days: 65	
Asphalt 02/15/2009-05/31/2009	1,739.43
Paving Off-Gas	0.00
Paving Off Road Diesel	1,131.92
Paving On Road Diesel	366.06
Paving Worker Trips	241.46
Building 09/15/2007-05/15/2009	10,063.46
Building Off Road Diesel	3,197.75
Building Vendor Trips	3,314.38
Building Worker Trips	3,551.33
Coating 10/08/2007-05/31/2009	32.26
Architectural Coating	0.00
Coating Worker Trips	32.26

Page: 7

5/12/2009 3:45:42 PM

Time Slice 5/18/2009-5/29/2009	1,771.69
Active Days: 10	
Asphalt 02/15/2009-05/31/2009	1,739.43
Paving Off-Gas	0.00
Paving Off Road Diesel	1,131.92
Paving On Road Diesel	366.06
Paving Worker Trips	241.46
Coating 10/08/2007-05/31/2009	32.26
Architectural Coating	0.00
Coating Worker Trips	32.26

Phase Assumptions

Phase: Demolition 6/1/2007 - 6/30/2007 - Type Your Description Here

Building Volume Total (cubic feet): 85540

Building Volume Daily (cubic feet): 16875

On Road Truck Travel (VMT): 234.38

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Fine Grading 8/15/2007 - 9/15/2007 - Default Fine Site Grading Description

Total Acres Disturbed: 21.1

Maximum Daily Acreage Disturbed: 5.28

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 2083.33

Off-Road Equipment:

Page: 8

5/12/2009 3:45:42 PM

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 6/15/2007 - 9/1/2007 - Type Your Description Here

Total Acres Disturbed: 21.1

Maximum Daily Acreage Disturbed: 5.28

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 967.26

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 2/15/2009 - 5/31/2009 - Default Paving Description

Acres to be Paved: 5.28

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day
1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 9/15/2007 - 5/15/2009 - Default Building Construction Description

Off-Road Equipment:

2 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day
3 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
2 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

Page: 9

5/12/2009 3:45:42 PM

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 10/8/2007 - 5/31/2009 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	<u>CO2</u>
Time Slice 6/1/2007-6/14/2007	3,294.71
Active Days: 10	
Demolition 06/01/2007-06/30/2007	3,294.71
Fugitive Dust	0.00
Demo Off Road Diesel	2,281.38
Demo On Road Diesel	862.48
Demo Worker Trips	150.84

Page: 10

5/12/2009 3:45:42 PM

Time Slice 6/15/2007-6/29/2007 10,012.46
Active Days: 11

Demolition 06/01/2007-
06/30/2007 3,294.71

Fugitive Dust 0.00

Demo Off Road Diesel 2,281.38

Demo On Road Diesel 862.48

Demo Worker Trips 150.84

Mass Grading 06/15/2007-
09/01/2007 6,717.76

Mass Grading Dust 0.00

Mass Grading Off Road Diesel 3,007.48

Mass Grading On Road Diesel 3,559.44

Mass Grading Worker Trips 150.84

Time Slice 7/2/2007-8/14/2007 6,717.76
Active Days: 32

Mass Grading 06/15/2007-
09/01/2007 6,717.76

Mass Grading Dust 0.00

Mass Grading Off Road Diesel 3,007.48

Mass Grading On Road Diesel 3,559.44

Mass Grading Worker Trips 150.84

Page: 11

5/12/2009 3:45:42 PM

Time Slice 8/15/2007-8/31/2007 17,542.56
Active Days: 13

Fine Grading 08/15/2007-
09/15/2007 10,824.80

Fine Grading Dust 0.00

Fine Grading Off Road Diesel 3,007.48

Fine Grading On Road Diesel 7,666.48

Fine Grading Worker Trips 150.84

Mass Grading 08/15/2007-
09/01/2007 6,717.76

Mass Grading Dust 0.00

Mass Grading Off Road Diesel 3,007.48

Mass Grading On Road Diesel 3,559.44

Mass Grading Worker Trips 150.84

Time Slice 9/3/2007-9/14/2007 10,824.80
Active Days: 10

Fine Grading 08/15/2007-
09/15/2007 10,824.80

Fine Grading Dust 0.00

Fine Grading Off Road Diesel 3,007.48

Fine Grading On Road Diesel 7,666.48

Fine Grading Worker Trips 150.84

Time Slice 9/17/2007-10/5/2007 10,061.72
Active Days: 15

Building 09/15/2007-05/15/2009 10,061.72

Building Off Road Diesel 3,197.75

Building Vendor Trips 3,314.23

Building Worker Trips 3,549.74

Page: 12

5/12/2009 3:45:42 PM

Time Slice 10/8/2007-12/31/2007 10,093.97
Active Days: 61

Building 09/15/2007-05/15/2009 10,061.72

Building Off Road Diesel 3,197.75

Building Vendor Trips 3,314.23

Building Worker Trips 3,549.74

Coating 10/08/2007-05/31/2009 32.25

Architectural Coating 0.00

Coating Worker Trips 32.25

Time Slice 1/1/2008-12/31/2008 10,094.21
Active Days: 262

Building 09/15/2007-05/15/2009 10,061.97

Building Off Road Diesel 3,197.75

Building Vendor Trips 3,314.35

Building Worker Trips 3,549.87

Coating 10/08/2007-05/31/2009 32.25

Architectural Coating 0.00

Coating Worker Trips 32.25

Page: 13

5/12/2009 3:45:42 PM

Time Slice 1/1/2009-2/13/2009 10,095.72
Active Days: 32

 Building 09/15/2007-05/15/2009 10,063.46

 Building Off Road Diesel 3,197.75

 Building Vendor Trips 3,314.38

 Building Worker Trips 3,551.33

 Coating 10/08/2007-05/31/2009 32.26

 Architectural Coating 0.00

 Coating Worker Trips 32.26

Time Slice 2/16/2009-5/15/2009 11,835.16

Active Days: 65

 Asphalt 02/15/2009-05/31/2009 1,739.43

 Paving Off-Gas 0.00

 Paving Off Road Diesel 1,131.92

 Paving On Road Diesel 366.06

 Paving Worker Trips 241.46

 Building 09/15/2007-05/15/2009 10,063.46

 Building Off Road Diesel 3,197.75

 Building Vendor Trips 3,314.38

 Building Worker Trips 3,551.33

 Coating 10/08/2007-05/31/2009 32.26

 Architectural Coating 0.00

 Coating Worker Trips 32.26

5/12/2009 3:45:43 PM

Time Slice 5/18/2009-5/29/2009	1,771.69
Active Days: 10	
Asphalt 02/15/2009-05/31/2009	1,739.43
Paving Off-Gas	0.00
Paving Off Road Diesel	1,131.92
Paving On Road Diesel	366.06
Paving Worker Trips	241.46
Coating 10/08/2007-05/31/2009	32.26
Architectural Coating	0.00
Coating Worker Trips	32.26

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Demolition 6/1/2007 - 6/30/2007 - Type Your Description Here

For Concrete/Industrial Saws, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Concrete/Industrial Saws, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

The following mitigation measures apply to Phase: Fine Grading 8/15/2007 - 9/15/2007 - Default Fine Site Grading Description

For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

Page: 15

5/12/2009 3:45:43 PM

For Soil Stabilizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

The following mitigation measures apply to Phase: Mass Grading 6/15/2007 - 9/1/2007 - Type Your Description Here

For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stabilizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

Page: 16

5/12/2009 3:45:43 PM

PM10: 55% PM25: 55%

For Graders, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

The following mitigation measures apply to Phase: Paving 2/15/2009 - 5/31/2009 - Default Paving Description

For Cement and Mortar Mixers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pavers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Pavers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Paving Equipment, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Paving Equipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

Page: 17

5/12/2009 3:45:43 PM

For Rollers, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

The following mitigation measures apply to Phase: Building Construction 9/15/2007 - 5/15/2009 - Default Building Construction Description

For Cranes, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Use Aqueous Diesel Fuel mitigation reduces emissions by:

NOX: 15% PM10: 50% PM25: 50%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

The following mitigation measures apply to Phase: Architectural Coating 10/8/2007 - 5/31/2009 - Default Architectural Coating Description

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

Page: 18

5/12/2009 3:45:43 PM

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>CO2</u>
Natural Gas	4,796.96
Hearth - No Summer Emissions	
Landscape	5.62
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	4,802.58

5/12/2009 3:45:43 PM

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

<u>Source</u>	<u>CO2</u>
Natural Gas	3,837.57
Hearth - No Summer Emissions	
Landscape	5.62
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, mitigated)	3,843.19

Area Source Mitigation Measures Selected

<u>Mitigation Description</u>	<u>Percent Reduction</u>
Commercial Increase Energy Efficiency Beyond Title 24	20.00
Percent of Commercial and Industrial Landscape Equipment that are Electrically Powered and have Electrical Outlets Available	20.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Page: 20

5/12/2009 3:45:43 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	CO2
Hotel	15,145.00
Casino and Entertainment	402,268.05
TOTALS (lbs/day, unmitigated)	417,413.05

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

<u>Source</u>	CO2
Hotel	14,781.23
Casino and Entertainment	392,610.55
TOTALS (lbs/day, mitigated)	407,391.78

Operational Mitigation Options Selected

Residential Mitigation Measures

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Page: 21

5/12/2009 3:45:43 PM

Nonresidential Mitigation Measures

Percent Reduction in Trips is 0.4%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 24

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips Is 0

Non-Residential Free Transit Passes Mitigation

Percent Reduction in Trips is 0.1%

Note that the above percent is applied ONLY to worker trips.

Inputs Selected:

The Free Transit Passes checkbox was selected.

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2008 Temperature (F): 85 Season: Summer

Ermfac: Version : Ermfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Hotel		2.72	rooms	200.00	544.00	16,567.28

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Casino and Entertainment		39.43	1000 sq ft	359.62	14,179.82	440,787.75
					14,723.82	457,355.03

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.9	2.0	97.6	0.4
Light Truck < 3750 lbs	12.9	3.1	93.0	3.9
Light Truck 3751-5750 lbs	19.7	1.0	98.5	0.5
Med Truck 5751-8500 lbs	6.5	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	78.1	21.9	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	35.5	35.5	11.8	35.5	35.5

	<u>Travel Conditions</u>					
	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	30.0	50.0	50.0	30.0	50.0	50.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5
Casino and Entertainment				2.0	1.0	97.0

Operational Changes to Defaults

Home-based work average speed changed from 35 mph to 30 mph

Home-based work urban trip length changed from 10.8 miles to 11.8 miles

Home-based shop average speed changed from 35 mph to 50 mph

Home-based shop urban trip length changed from 7.3 miles to 35.5 miles

Home-based other average speed changed from 35 mph to 50 mph

Home-based other urban trip length changed from 7.5 miles to 35.5 miles

Commercial-based commute average speed changed from 35 mph to 30 mph

Commercial-based commute urban trip length changed from 9.5 miles to 11.8 miles

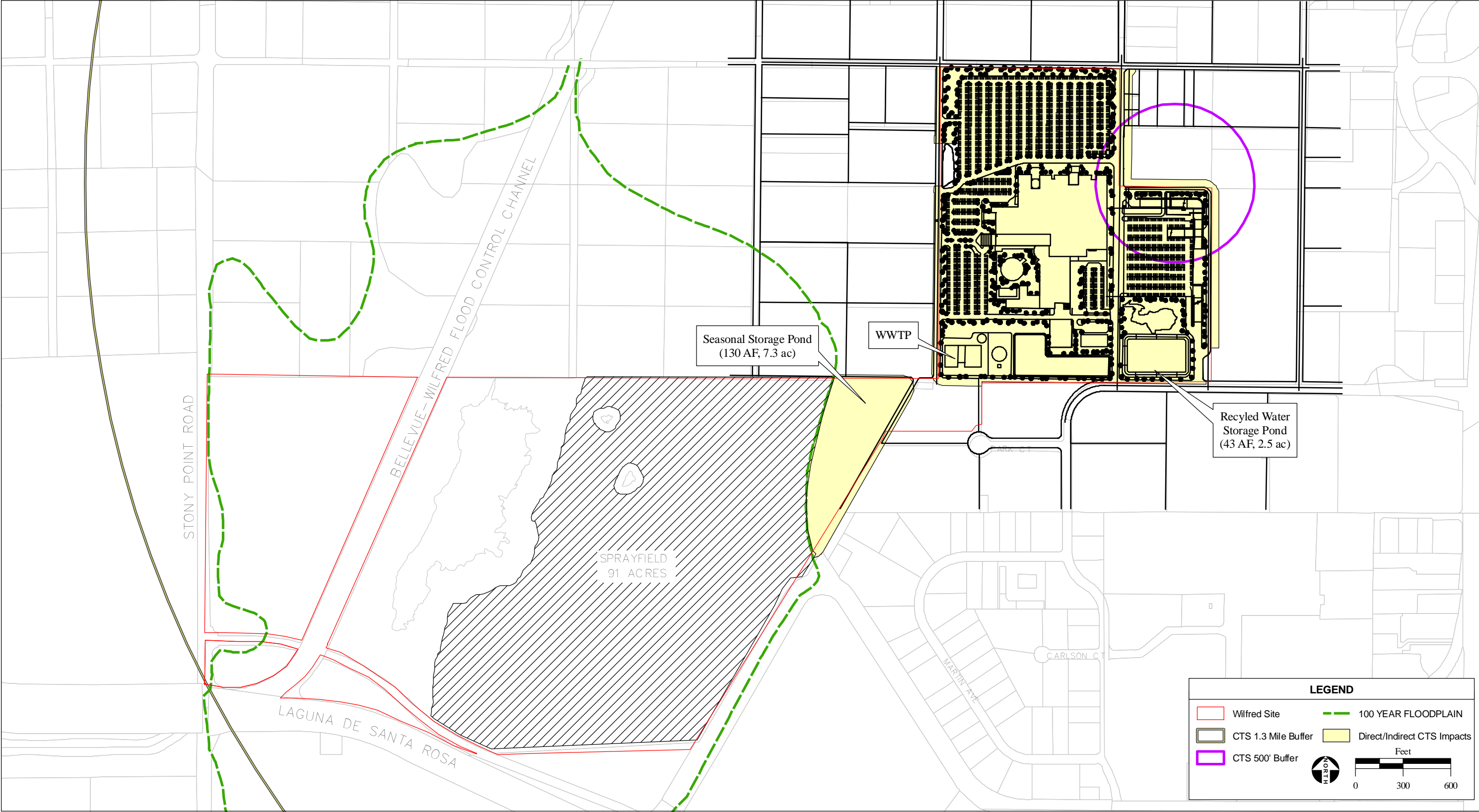
Commercial-based non-work average speed changed from 35 mph to 50 mph

Commercial-based non-work urban trip length changed from 7.35 miles to 35.5 miles

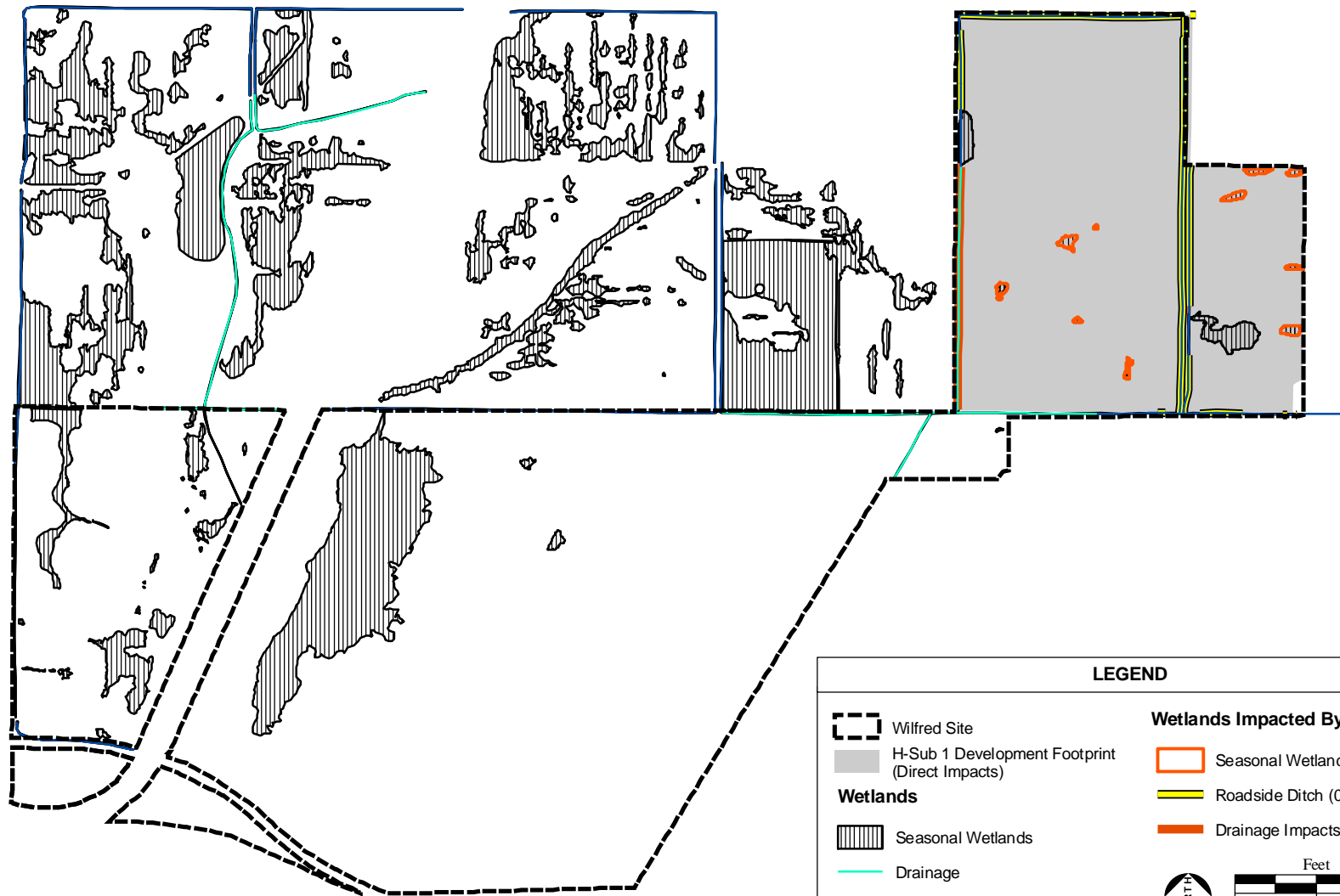
Commercial-based customer average speed changed from 35 mph to 50 mph

Commercial-based customer urban trip length changed from 7.35 miles to 35.5 miles

Biology



SOURCE: Huffman & Broadway, 2009; HydroScience Engineering, 2007; AES, 2009



Traffic

Final Traffic Impact Study

**GRATON RANCHERIA
CASINO AND HOTEL -
ALTERNATIVES A, B, C, D, E, & H
AND VARIANT H-SUB1
SONOMA COUNTY, CA**

May 2009

Prepared for:

Analytical Environmental Services

Prepared by:

Kimley-Horn and Associates, Inc.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
INTRODUCTION.....	2
Study Methodology.....	2
Intersections Included in Analysis	6
Freeway Segments and Ramps Included in Analysis	7
EXISTING CONDITIONS	8
Existing Site Uses	8
Existing Uses in Vicinity of Sites	8
Existing Roadways, Freeway Segments, and Ramps	8
Existing Lane Configurations and Traffic Control.....	11
Existing Traffic Turning Movement Volumes	11
Existing Pedestrian and Bicycle Facilities	12
Existing Transit Service.....	12
Existing Collision History	13
Existing Levels of Service at Study Intersections	22
Existing Conditions Traffic Signal Warrant Analysis	25
Existing Levels of Service at Freeway Segments and Ramps	26
NO ACTION ALTERNATIVE	27
Proposed Roadway Projects in Vicinity of Site	27
Proposed Development Projects in Vicinity of Sites	29
Near-Term Lane Configurations and Traffic Control	29
Near-Term Traffic Volumes (No Project)	29
Long-Term Lane Configurations and Traffic Control	29
Long-Term Cumulative Forecast (No Project)	30
LOS Conditions and Impacts	30
Traffic Signal Warrant Analysis.....	31
LOS Conditions and Impacts on Freeway and Ramps	34
GENERAL PROJECT INFORMATION.....	43
Project Trip Generation	43
Project Trip Distribution and Assignment	46
Potential Conflicts with Special Event Traffic.....	47
Potential Effects on Transit, Bicycle, and Pedestrian Mobility.....	49
Construction Traffic Impacts	50
ALTERNATIVE A – WILFRED AVENUE SITE.....	54
Site Access	54
Trip Generation – Alternatives A, B, and C	54
Project Trip Distribution and Assignment	55
Near-Term Plus Project Traffic Volumes.....	55
Long-Term Plus Project Traffic Volumes.....	56
Alternative A LOS Conditions and Impacts at Intersections	56
Alternative A Traffic Signal Warrant Analysis	58
Alternative A LOS Conditions and Impacts on Freeway and Ramps.....	59

Potential Effects on Intersection Safety.....	61
Queuing Summary	62
Alternative A Mitigations	64

ALTERNATIVE B – NORTHWEST STONY POINT SITE 81

Site Access	81
Trip Generation – Alternative B.....	81
Project Trip Distribution and Assignment	82
Near-Term Plus Project Traffic Volumes.....	82
Cumulative Plus Project Traffic Volumes	82
Alternative B LOS Conditions and Impacts at Intersections	82
Alternative B Traffic Signal Warrant Analysis	85
Alternative B LOS Conditions and Impacts on Freeway and Ramps.....	85
Potential Effects on Intersection Safety.....	87
Queuing Summary	88
Alternative B Mitigations	90

ALTERNATIVE C – NORTHEAST STONY POINT SITE 107

Site Access	107
Trip Generation – Alternative C	107
Project Trip Distribution and Assignment	107
Near-Term Plus Project Traffic Volumes.....	108
Cumulative Long -Term Plus Project Traffic Volumes	108
Alternative C LOS Conditions and Impacts at Intersections.....	108
Alternative C Traffic Signal Warrant Analysis	110
Alternative C LOS Conditions and Impacts on Freeway and Ramps	111
Potential Effects on Intersection Safety.....	113
Queuing Summary	114
Alternative C Mitigations.....	116

ALTERNATIVE D – NORTHWEST STONY POINT REDUCED INTENSITY OPTION.....132

Site Access	132
Trip Generation – Alternative D	133
Project Trip Distribution and Assignment	133
Near-Term Plus Project Traffic Volumes.....	134
Cumulative Plus Project Traffic Volumes	134
Alternative D LOS Conditions and Impacts at Intersections.....	134
Alternative D Traffic Signal Warrant Analysis	136
Alternative D LOS Conditions and Impacts on Freeway and Ramps	137
Potential Effects on Intersection Safety.....	139
Queuing Summary	140
Alternative D Mitigations.....	142

ALTERNATIVE E – NORTHWEST STONY POINT BUSINESS PARK OPTION..... 159

Site Access	159
Trip Generation – Alternative E.....	159
Project Trip Distribution and Assignment	160
Near-Term Plus Project Traffic Volumes.....	161
Long -Term Plus Project Traffic Volumes.....	161
Alternative E LOS Conditions and Impacts at Intersections	161
Alternative E Traffic Signal Warrant Analysis	163

Alternative E LOS Conditions and Impacts on Freeway and Ramps.....	163
Potential Conflicts with Special Event Traffic.....	164
Potential Effects on Intersection Safety.....	166
Potential Effects on Transit.....	166
Queuing Summary	167
Alternative E Mitigations	169

ALTERNATIVE H – WILFRED AVENUE SITE REDUCED INTENSITY OPTION..... 186

Site Access	186
Trip Generation – Alternative H	187
Project Trip Distribution and Assignment	187
Near-Term Plus Project Traffic Volumes.....	187
Cumulative Plus Project Traffic Volumes	187
Alternative H LOS Conditions and Impacts at Intersections.....	187
Alternative H Traffic Signal Warrant Analysis.....	190
Alternative H LOS Conditions and Impacts on Freeway and Ramps	190
Potential Effects on Intersection Safety.....	192
Queuing Summary	193
Alternative H Mitigations.....	195

VARIANT H-SUB1 – WILFRED AVENUE SITE REDUCED INTENSITY OPTION 212

Trip Generation – Variant H-sub1	212
Project Trip Distribution and Assignment	213
Near-Term Plus Project Traffic Volumes.....	213
Cumulative Plus Project Traffic Volumes	213
Variant H-sub1 LOS Conditions and Impacts at Intersections	214
Variant H-sub1 Traffic Signal Warrant Analysis.....	216
Variant H-sub1 LOS Conditions and Impacts on Freeway and Ramps	216
Queuing Summary	219
Variant H-sub1 Mitigations.....	220

REFERENCES CONSULTED 225

LIST OF FIGURES

Figure 1 – Project Study Intersections.....	36
Figure 2 – Existing Lane Geometry and Traffic Control.....	37
Figure 3 – Existing Peak Hour Turning Movement Volumes	38
Figure 4 – Near-Term Lane Geometry and Traffic Control.....	39
Figure 5 – Near-Term PM Traffic Volumes.....	40
Figure 6 – Long-Term Lane Geometry and Traffic Control.....	41
Figure 7 – Long-Term Cumulative PM Traffic Volumes.....	42
Figure A 1 – Project Site Location	72
Figure A 2 – Proposed Project Site Plan	73

Figure A 3 – Project Trip Distribution – In.....	74
Figure A 4 – Project Trip Distribution – Out.....	75
Figure A 5 – Project Generated PM Traffic Volumes.....	76
Figure A 6 – Near-Term + Project PM Traffic Volumes	77
Figure A 7 – Long-Term Cumulative + Project PM Traffic Volumes	78
Figure A 8 – Near-Term Mitigated Lane Geometry and Traffic Control	79
Figure A 9 – Long-Term Mitigated Lane Geometry and Traffic Control.....	80
Figure B 1 – Project Site Location.....	98
Figure B 2 – Proposed Project Site Plan.....	99
Figure B 3 – Project Trip Distribution – In.....	100
Figure B 4 – Project Trip Distribution – Out.....	101
Figure B 5 – Project Generated PM Traffic Volumes.....	102
Figure B 6 – Near-Term + Project PM Traffic Volumes	103
Figure B 7 – Long-Term Cumulative + Project PM Traffic Volumes	104
Figure B 8 – Near-Term Mitigated Lane Geometry and Traffic Control	105
Figure B 9 – Long-Term Mitigated Lane Geometry and Traffic Control.....	106
Figure C 1 – Project Site Location.....	123
Figure C 2 – Proposed Project Site Plan.....	124
Figure C 3 – Project Trip Distribution – In	125
Figure C 4 – Project Trip Distribution – Out.....	126
Figure C 5 – Project Generated PM Traffic Volumes	127
Figure C 6 – Near-Term + Project PM Traffic Volumes.....	128
Figure C 7 – Long-Term Cumulative + Project PM Traffic Volumes.....	129
Figure C 8 – Near-Term Mitigated Lane Geometry and Traffic Control.....	130
Figure C 9 – Long-Term Mitigated Lane Geometry and Traffic Control.....	131
Figure D 1 – Project Site Location.....	150
Figure D 2 – Proposed Project Site Plan.....	151
Figure D 3 – Project Trip Distribution – In	152
Figure D 4 – Project Trip Distribution – Out.....	153
Figure D 5 – Project Generated PM Traffic Volumes	154
Figure D 6 – Near-Term + Project PM Traffic Volumes.....	155
Figure D 7 – Long-Term Cumulative + Project PM Traffic Volumes.....	156
Figure D 8 – Near-Term Mitigated Lane Geometry and Traffic Control.....	157
Figure D 9 – Long-Term Mitigated Lane Geometry and Traffic Control.....	158
Figure E 1 – Project Site Location.....	177
Figure E 2 – Proposed Project Site Plan.....	178
Figure E 3 – Project Trip Distribution – In.....	179
Figure E 4 – Project Trip Distribution – Out.....	180
Figure E 5 – Project Generated PM Traffic Volumes.....	181
Figure E 6 – Near-Term + Project PM Traffic Volumes	182

Figure E 7 – Long-Term Cumulative + Project PM Traffic Volumes	183
Figure E 8 – Near-Term Mitigated Lane Geometry and Traffic Control	184
Figure E 9 – Long-Term Mitigated Lane Geometry and Traffic Control.....	185
Figure H 1 – Project Site Location.....	203
Figure H 2 – Proposed Project Site Plan.....	204
Figure H 3 – Project Trip Distribution – In	205
Figure H 4 – Project Trip Distribution – Out.....	206
Figure H 5 – Project Generated PM Traffic Volumes	207
Figure H 6 – Near-Term + Project PM Traffic Volumes	208
Figure H 7 – Long-Term Cumulative + Project PM Traffic Volumes.....	209
Figure H 8 – Near-Term Mitigated Lane Geometry and Traffic Control.....	210
Figure H 9 – Long-Term Mitigated Lane Geometry	211

LIST OF TABLES

Table 1 – Intersection Level of Service Definitions.....	4
Table 2 – Local Level Of Service Criteria	5
Table 3 – Accident Rate Data	22
Table 4 – Existing Levels of Service.....	24
Table 5 – Existing US-101 Levels of Service	26
Table 6 – No Action Levels of Service.....	33
Table 7 – No Action Alternative Freeway Levels of Service	35
Table A 1 – Alternatives A, B and C Project Trip Generation	55
Table A 2 – Alternative A Levels of Service	57
Table A 3 – Alternative A Freeway Levels of Service.....	60
Table A 4 – Alternative A Queuing Summary	63
Table A 5 – Alternative A Summary of Mitigations	66
Table A 6 – Alternative A Mitigated Intersection Levels of Service.....	68
Table A 7 – Alternative A Mitigated Freeway Level of Service Summary.....	70
Table B 1 – Alternative B Levels of Service	84
Table B 2 – Alternative B Freeway Levels of Service.....	86
Table B 3 – Alternative B Queuing Summary	89
Table B 4 – Alternative B Summary of Mitigations	92
Table B 5 – Alternative B Mitigated Intersection Levels of Service.....	94
Table B 6 – Alternative B Mitigated Freeway Level of Service Summary	96
Table C 1 – Alternative C Levels of Service	109
Table C 2 – Alternative C Freeway Levels of Service	112
Table C 3 – Alternative C Queuing Summary	115
Table C 4 – Alternative C Summary of Mitigations.....	117
Table C 5 – Mitigated Intersection Levels of Service.....	119

Table C 6 – Alternative C Mitigated Freeway Level of Service Summary	121
Table D 1 – Alternatives D and H Project Trip Generation	133
Table D 2 – Alternative D Levels of Service	135
Table D 3 – Alternative D Freeway Levels of Service	138
Table D 4 – Alternative D Queuing Summary	141
Table D 5 – Alternative D Summary of Mitigations	144
Table D 6 – Alternative D Mitigated Intersection Levels of Service	146
Table D 7 – Alternative D Mitigated Freeway Level of Service Summary	148
Table E 1 – Alternative E Project Trip Generation.....	160
Table E 2 – Alternative E Levels of Service	162
Table E 3 – Alternative E Freeway Levels of Service.....	165
Table E 4 – Alternative E Queuing Summary	168
Table E 5 – Alternative E Summary of Mitigations	171
Table E 6 – Alternative E Mitigated Intersection Levels of Service.....	173
Table E 7 – Mitigated Freeway Level of Service Summary	176
Table H 1 – Alternative H Levels of Service	189
Table H 2 – Alternative H Freeway Levels of Service	191
Table H 3 – Alternative H Queuing Summary	194
Table H 4 – Alternative H Summary of Mitigations	197
Table H 5 – Alternative H Mitigated Intersection Levels of Service	199
Table H 6 – Alternative H Mitigated Freeway Level of Service Summary	201
Table H-sub1 1 – Variant H-sub1 Project Trip Generation.....	213
Table H-sub1 2 – Variant H-sub1 Levels of Service.....	216
Table H-sub1 3 – Variant H-sub1 Freeway Levels of Service	218
Table H-sub1 4 – Variant H-sub1 Queuing Summary	219
Table H-sub1 5 – Variant H-sub1 Summary of Mitigations.....	221
Table H-sub1 6 – Variant H-sub1 Mitigated Intersection Levels of Service.....	222
Table H-sub1 7 – Variant H-sub1 Mitigated Freeway Level of Service Summary	224

EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc. (KHA) was retained by Analytical Environmental Services to prepare a traffic impact study for a casino and hotel proposed to be located west of Rohnert Park, California. There were seven alternatives evaluated at this location – No Action Alternative, Wilfred Avenue Alternative, Northwest Stony Point Alternative, Northeast Stony Point Alternative, Northwest Stony Point Reduced Intensity Alternative, Business Park Alternative, and Wilfred Avenue Reduced Intensity Alternative.

When completed, it is proposed that the casino will be 450,000 square feet with a 300 room hotel at the Wilfred Avenue, Northwest Stony Point, and Northeast Stony Point sites. This new development will generate roughly 18,261 daily trips. During the peak hours of the weekday, approximately 1,384 AM peak hour trips and 2,287 PM peak hour trips will enter or exit the casino/hotel and affect nearby intersections and roadway segments.

The Reduced Intensity Alternative casino will be 315,100 square feet with a 100 room hotel. This new development will generate roughly 12,696 daily trips. During the peak hours of the weekday, approximately 949 AM peak hour trips and 1,580 PM peak hour trips will enter or exit the casino/hotel and affect nearby intersections and roadway segments.

The Business Park Alternative will have 400,000 square feet of light industrial and 100,000 square feet of commercial space. This new development will generate roughly 7,082 daily trips. During the peak hours of the weekday, approximately 471 AM peak hour trips and 621 PM peak hour trips will enter or exit the business park and affect nearby intersections and roadway segments.

There are extensive mitigations for all scenarios as a result of the proposed alternatives.

INTRODUCTION

Kimley-Horn and Associates, Inc was retained by Analytical Environmental Services to prepare a traffic impact study for a casino and hotel proposed to be located west of Rohnert Park, California. The site is immediately west of the city's sphere of influence in land identified as community separator in the Rohnert Park General Plan. It is proposed that the casino and hotel be completed by late 2007/early 2008.

The purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development and to assist the Tribe's environmental consultant in the preparation of an Environmental Impact Statement for the project. This traffic study was prepared based on discussions with, and criteria set forth by, the City of Rohnert Park, County of Sonoma, and the California Department of Transportation (Caltrans).

Study Methodology

This traffic study was based on planning conditions assumed in the Rohnert Park General Plan (adopted July 2000), the Sonoma County General Plan (adopted 1989), as well as information provided by Caltrans and Sonoma County Regional Transportation Authority. Because none of the agencies' planning and project programming documents anticipated a casino and hotel development or its potential impacts, this study evaluated the addition of a casino and hotel near the intersection of Stony Point Road and Wilfred Avenue.

Development Conditions

The traffic study was based on the following study scenarios:

- Existing Conditions – evaluates current traffic counts, existing roadway geometry, and existing development conditions.
- 2008 Conditions – evaluates existing traffic volumes with the addition of planned projects anticipated to be completed by 2008 assuming an average 2% per year increase in the background traffic.
- 2008 Conditions Plus Project – evaluates effects of traffic from each Development Alternative on 2008 traffic operations.
- 2020 Cumulative Conditions – analysis of build-out conditions in the area projected for 2020 using the forecast from the Sonoma County travel forecasting model.
- 2020 Cumulative Plus Project Conditions – evaluates effects of traffic from each Development Alternative on 2020 Cumulative traffic operations.

Development Alternatives

Six development alternatives are analyzed in this report. A seventh development alternative, which was proposed along Lakeville Highway near the intersection of SR-39, is analyzed in a separate report.

- No Action Alternative – assumes no action would be taken; evaluates conditions that would occur without the proposed project.
- Alternative A – Wilfred Site – assumes casino/hotel resort approximately 762,300 total square feet with access from Business Park Drive and Wilfred Avenue.
- Alternative B – Northwest Stony Point Site – assumes casino/hotel resort approximately 762,300 total square feet with access from Wilfred Avenue and Stony Point Road.
- Alternative C – Northeast Stony Point Site – assumes casino/hotel resort approximately total 762,300 square feet with access from Wilfred Avenue.
- Alternative D – Northwest Stony Point Reduced Intensity Site – assumes Reduced Intensity casino/hotel resort approximately 413,400 total square feet with access from Wilfred Avenue and Stony Point Road.
- Alternative E – Northwest Stony Point Business Park Site – assumes Business Park approximately 500,000 total square feet of space with access from Wilfred Avenue and Stony Point Road.
- Alternative H – Wilfred Avenue Reduced Intensity Site – assumes Reduced Intensity casino/hotel resort approximately 413,400 total square feet with access from Business Park Drive and Wilfred Avenue.
- Variant H-sub1 – Wilfred Avenue Reduced Intensity Site – assumes Reduced Intensity casino/hotel resort with approximately 534,900 total square feet with access from Business Park Drive and Wilfred Avenue.

Operating Conditions and Criteria

Operating conditions experienced by drivers are described in terms of Level of Service (LOS), which is a qualitative measure of factors such as delay, speed, travel time, freedom to maneuver, and driving comfort and convenience. Levels of service are represented by a letter scale from LOS A to LOS F, with LOS A representing the best performance and LOS F representing the poorest performance.

Table 1 relates the operational characteristics associated with each level of service category for both signalized and unsignalized intersections. **Table 2** summarizes the local level of service standards. LOS F (with delay reported as OVRFL) indicates that the intersection is in a state of overflow such that the analysis software is unable to calculate an average delay.

Table 1 – Intersection Level of Service Definitions

Level of Service	Description	Signalized (Avg. control delay per vehicle sec/veh)	Unsignalized (Avg. control delay per vehicle sec/veh)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	≤ 10	≤ 10
B	Stable traffic. Traffic flows smoothly with few delays.	> 10 – 20	> 10 – 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	> 20 – 35	> 15 – 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	> 35 – 55	> 25 – 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	> 55 – 80	> 35 – 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 80	> 50
Source: Transportation Research Board, <i>Highway Capacity Manual 2000</i> , National Research Council, 2000.			

Table 2 – Local Level Of Service Criteria

Jurisdiction	Satisfactory Criteria	Significance Criteria
Sonoma County	D	Project causes LOS to fall below D or adds > 5 seconds to intersection already operating at LOS D or worse
Rohnert Park	C	<p>Project causes LOS to fall below C.</p> <p>Lower LOS is permitted if otherwise below or if no feasible improvement is available and project does not cause further decrease in LOS.</p> <p>The following study area study intersections are permitted to operate at LOS D:</p> <p>Wilfred Avenue / Redwood Drive</p> <p>Golf Course Drive Commerce Blvd</p>
Caltrans	<p>D - signalized intersections and highways</p> <p>E – freeway segments and ramps</p>	<p>Project causes LOS to fall below D at intersections and highways</p> <p>Project causes LOS to fall below E for freeway segments</p> <p>Project causes vehicle queues to extend outside of available storage or onto the freeway</p> <p>Project causes freeway ramp merge/diverge LOS to be worse than freeway LOS</p> <p>If LOS already below criteria, the existing LOS and related measure of effectiveness (MOE) are to be maintained.</p>

The change to the LOS standard was contained in a Caltrans response¹ during the scoping period of the project. Normally the standard would be LOS C or better for intersections (per Caltrans' Guide for the Preparation of Traffic Impact Studies) but in the letter, Caltrans indicated at the Rohnert Park site, a lower level of service was acceptable before mitigation would be required.

¹ Timothy Sable (Caltrans) letter to Christine Nagle (NIGC), 1 April 2004.

Traffic analysis was completed using Synchro software at all intersections and Highway Capacity Software (HCS) at ramps and freeway segments. Both software platforms are based on the methodology of the *Highway Capacity Manual*.

Intersections Included in Analysis

The proposed project will generate new vehicular trips that will increase traffic volumes on the nearby street network. To assess changes in traffic conditions associated with the project, the following intersections, illustrated in **Figure 1**, were evaluated in this traffic study:

1. Stony Point Rd and Wilfred Ave
2. Primrose Ave and Wilfred Ave
3. Whistler Ave and Wilfred Ave
4. Langner Ave and Wilfred Ave
5. Labath Ave and Wilfred Ave
6. Dowdell Ave and Wilfred Ave
7. Redwood Dr and Wilfred Ave
8. Redwood Dr and Commerce Blvd (evaluated as existing and near-term only – changes as part of the Caltrans interchange project and not evaluated in the cumulative scenario)
9. Wilfred Avenue and US 101 SB Ramps (future intersection)
10. Golf Course Dr and Commerce Blvd
11. Golf Course Dr and Roberts Lake Rd
12. Commerce Blvd and US 101 NB Ramps
13. Project Driveway and Stony Point Rd
14. Business Park Dr and Labath Ave
15. Business Park Dr and Redwood Dr
16. Rohnert Park Expressway and Stony Point Rd
17. Rohnert Park Expressway and Labath Ave
18. Rohnert Park Expressway and Redwood Dr
19. Rohnert Park Expressway and US 101 SB Ramps
20. Rohnert Park Expressway and US 101 NB Ramps
21. Rohnert Park Expressway and Commerce Blvd
22. Gravenstein Hwy (SR-116) and Stony Point Rd
23. Gravenstein Hwy (SR-116) and Redwood Dr
24. Gravenstein Hwy (SR-116) and SB US 101 Ramps
25. Gravenstein Hwy (SR-116) and NB US 101 Off-Ramp
26. Millbrae Ave and Stony Point Rd
27. Millbrae Ave and Primrose Ave
28. Millbrae Ave and Whistler Ave
29. Millbrae Ave and Langner Ave
30. Millbrae Ave and Labath Ave
31. Millbrae Ave and Dowdell Ave

Freeway Segments and Ramps Included in Analysis

The following freeway segments and ramps were evaluated in this traffic study.

Segments

- Northbound US-101 south of Gravenstein Highway (SR-116)
- Northbound US-101 between Gravenstein Highway (SR-116) and Rohnert Park Expressway
- Northbound US-101 between Rohnert Park Expressway and Wilfred Avenue
- Northbound US-101 between Wilfred Avenue and Santa Rosa Avenue
- Northbound US-101 north of Santa Rosa Avenue
- Southbound US-101 north of Santa Rosa Avenue
- Southbound US-101 between Santa Rosa Avenue and Wilfred Avenue
- Southbound US-101 between Wilfred Avenue and Rohnert Park Expressway
- Southbound US-101 between Rohnert Park Expressway and Gravenstein Highway (SR-116)
- Southbound US-101 south of Gravenstein Highway (SR-116)

Ramps

- Northbound Gravenstein Highway (SR-116) on-ramp
- Northbound Rohnert Park Expressway loop on-ramp
- Northbound Rohnert Park Expressway on-ramp
- Northbound Wilfred Avenue on-ramp
- Southbound Santa Rosa Avenue on-ramp
- Southbound Wilfred Avenue on-ramp
- Southbound Rohnert Park Expressway loop on-ramp
- Southbound Rohnert Park Expressway on-ramp
- Southbound Gravenstein Highway (SR-116) on-ramp
- Northbound Gravenstein Highway (SR-116) off-ramp
- Northbound Rohnert Park Expressway off-ramp
- Northbound Wilfred Avenue off-ramp
- Northbound Santa Rosa Avenue off-ramp
- Southbound Wilfred Avenue off-ramp
- Southbound Rohnert Park Expressway off-ramp
- Southbound Gravenstein Highway (SR-116) off-ramp

EXISTING CONDITIONS

Existing Site Uses

Both the Wilfred Avenue and Stony Point casino and hotel sites are generally level and currently used for agricultural purposes. Most of the Stony Point site is vacant; however, a large barn and related building are located in the northwest portion of the project site. The project area is divided by the Bellevue-Wilfred Flood Control Channel that passes diagonally through the site. Most of the Wilfred Avenue site is vacant as well with less than five single family dwellings on the site.

Existing Uses in Vicinity of Sites

Land areas north, south and west of the Stony Point site are currently used for rural agricultural purposes and are not expected to change in the next 20 years. Land uses east of the Stony Point site consist of County Community Separator or are within the City of Rohnert Park and are designated for medium and high density residential, industrial, business park, and commercial uses. Much of the area in Rohnert Park is still vacant and is expected to develop as identified in the Rohnert Park General Plan, the Northwest Specific Plan, and the Wilfred-Dowdell Specific Plan.

Land areas north and west of the Wilfred Avenue site are currently used for agricultural purposes and are not expected to change in the next 20 years. Land areas south and east of the Wilfred Avenue site are currently being developed or are developed as identified in the Rohnert Park General Plan, the Northwest Specific Plan, and the Wilfred-Dowdell Specific Plan.

Existing Roadways, Freeway Segments, and Ramps

Below is a description of the roadway facilities, freeway segments, and ramps included in the traffic impact study.

Roadway Facilities

Business Park Drive – is a two lane roadway with curbs and gutters and no parking. The road is classified in the Rohnert Park General Plan as a Minor Collector.

Dowdell Avenue – is a narrow two lane roadway with open roadside ditches and no shoulders from south of Wilfred to 385 feet north of Wilfred Avenue where the roadway widens slightly and curbs and gutters are present. The road is classified in the Rohnert Park General Plan as a Minor Collector in the future.

Commerce Boulevard – is an urban roadway with curbs and gutters and is classified as a Major Arterial in the Rohnert Park General Plan. The road width varies from two lanes to five lanes wide with left (and sometimes right) turn lanes at major intersections.

Golf Course Drive – is an urban roadway with curbs and gutters and is classified as a Major Arterial in the Rohnert Park General Plan. The road is five lanes wide near the Wilfred interchange with left turn lanes at major intersections.

Gravenstein Highway (SR-116) – is an urban roadway with curbs and gutters and is classified in the Rohnert Park General Plan as a Minor Arterial west of Redwood Drive and as a Major Arterial east of Redwood Drive. In the unincorporated area of Sonoma County, SR-116 is classified as a Rural Principal Arterial in the Sonoma County General Plan. The road is four lanes wide with left turn lanes at major intersections.

Labath Avenue – is classified as a Minor Collector in the Rohnert Park General Plan (between Rohnert Park Expressway and Wilfred Avenue). Other segments of Labath Avenue are classified as Local Roads. The road is two lanes wide with on-street parking, curbs and gutters south of Business Park Drive. Between Business Park Drive and Wilfred Avenue, the street is one to two lanes wide and unimproved. North of Wilfred Avenue the street is a narrow two lane roadway with open roadside ditches and no shoulders. Currently there is a missing segment north of Business Park Drive but the Rohnert Park General Plan shows the completion of the segment as lands are developed in the vicinity.

Langner Avenue – is a two lane roadway with open roadside ditches and no shoulders. The roadway is classified as a local road in the Sonoma County General Plan.

Millbrae Avenue – is a narrow two lane roadway with open roadside ditches and no shoulders. The road is classified as a Rural Minor Collector in the Draft 2020 Sonoma County General Plan.

Primrose Avenue – is a narrow two lane roadway with open roadside ditches and no shoulders. The road is classified as a local road in the Sonoma County General Plan.

Redwood Drive – is an urban roadway with curbs and gutters and is classified as a Major Arterial in the Rohnert Park General Plan. The road is five lanes wide with left (and sometimes right) turn lanes at major intersections.

Rohnert Park Expressway – is an urban roadway with curbs and gutters and is classified as a Major Arterial in the Rohnert Park General Plan. The road is six lanes wide (with turn lanes) near the US-101 freeway but narrows to only two lanes at the city limit. Rohnert Park Expressway between the city limit and Stony Point Road is a two lane facility with wide paved shoulders and is classified as a Minor Arterial in the Rohnert Park General Plan and as a Rural Principal Arterial in the unincorporated areas of Sonoma County in the Sonoma County General Plan.

Stony Point Road – is a two lane rural roadway with open roadside ditches, wide shoulders, and left turn bays at major intersections. The road is classified as a Rural Principal Arterial and is shown in the Sonoma County General Plan.

Whistler Avenue – is a narrow two lane roadway with open roadside ditches and no shoulders. The road is classified as a local road in the Sonoma County General Plan.

Wilfred Avenue – is a rural two lane roadway with open roadside ditches and no shoulders. Designated as Major Arterial in the Rohnert Park General Plan within the City's Sphere of Influence and as a Rural Major Collector outside Rohnert Park as shown in the Sonoma County General Plan, the road is planned to be expanded in the future to 4 lanes within the city limits.

Segments

Northbound/Southbound US-101 south of Gravenstein Highway (SR-116) – is two lanes in each direction with paved shoulders and narrow grassy median and guard rail.

Northbound/Southbound US-101 between Gravenstein Highway (SR-116) and Rohnert Park Expressway – is two lanes in each direction with paved shoulders and narrow grassy median and guard rail.

Northbound/Southbound US-101 between Rohnert Park Expressway and Wilfred Avenue – is two lanes in each direction with paved shoulders and narrow grassy median and guard rail.

Northbound/Southbound US-101 between Wilfred Avenue and Santa Rosa Avenue – is three lanes in each direction with paved shoulders and K-rail in the median. One of the lanes in each direction is for high occupancy vehicles.

Northbound/Southbound US-101 north of Santa Rosa Avenue – is three lanes in each direction with paved shoulders and K-rail in the median. One of the lanes in each direction is for high occupancy vehicles.

Ramps

Northbound Gravenstein Highway (SR-116) on-ramp – consists of a single lane on-ramp.

Northbound Rohnert Park Expressway loop on-ramp – consists of a single lane on-ramp.

Northbound Rohnert Park Expressway on-ramp – consists of a single lane on-ramp.

Northbound Wilfred Avenue on-ramp – consists of a single lane on-ramp.

Southbound Santa Rosa Avenue on-ramp – consists of a single lane on-ramp.

Southbound Wilfred Avenue on-ramp – consists of a single lane on-ramp.

Southbound Rohnert Park Expressway loop on-ramp – consists of a single lane on-ramp.

Southbound Rohnert Park Expressway on-ramp – consists of a single lane on-ramp.

Southbound Gravenstein Highway (SR-116) on-ramp – consists of a single lane on-ramp.

Northbound Gravenstein Highway (SR-116) off-ramp – consists of a single lane off-ramp that widens to two lanes at the intersection with Gravenstein Highway (SR-116).

Northbound Rohnert Park Expressway off-ramp – consists of a single lane off-ramp that widens to two lanes at the intersection with Rohnert Park Expressway.

Northbound Wilfred Avenue off-ramp – consists of a single lane off-ramp that widens to three lanes at the intersection with Commerce Boulevard.

Northbound Santa Rosa Avenue off-ramp – consists of a single lane off-ramp that widens to three lanes at the intersection with Santa Rosa Avenue.

Southbound Wilfred Avenue off-ramp – consists of a single lane off-ramp that widens to three lanes at the intersection with Redwood Drive.

Southbound Rohnert Park Expressway off-ramp – consists of a single lane off-ramp that widens to three lanes at the intersection with Rohnert Park Expressway.

Southbound Gravenstein Highway (SR-116) off-ramp – consists of a single lane off-ramp that widens to three lanes at the intersection with Gravenstein Highway (SR-116).

Existing Lane Configurations and Traffic Control

Existing intersection lane configurations and traffic control at study intersections are illustrated in **Figure 2**. Traffic signals are located at most study intersections near the freeway; whereas, study intersections near the project site are generally unsignalized. The figure also shows the length of the right and left turn bays when present.

Existing Traffic Turning Movement Volumes

Weekday intersection turning movement volumes were manually collected in July and August 2005 at most project study area intersections as well as in November 2006 along Millbrae Avenue and are shown in **Figure 3**. Volumes were collected during the AM and PM peak periods of the day in the middle of the week. It should be noted that a segment of Wilfred Avenue from Stony Point Road to Langner Avenue was closed for

construction when the 2005 counts were being conducted. Traffic was diverted around the closure; therefore, 2004 volumes were used at these locations.

School traffic typically affects AM and mid-afternoon traffic conditions but has little effect on PM peak traffic levels which is the time period evaluated in the TIS. In addition, when schools are in session there would not be a significant increase in traffic due to a high volume of linked trips. Linked trips result from parents dropping off children at school on the way to work or other destinations. Therefore, traffic counts are believed to accurately portray the existing condition during the PM peak period.

Twenty-four hour freeway volumes and percent of trucks and RVs were collected in May and June 2004. Volumes were collected in each direction for US-101 segments north of the Wilfred interchange, south of the Rohnert Park Expressway interchange, and between the two interchanges. Freeway segment volume north of Santa Rosa Avenue and south of Gravenstein Highway (SR-116) was obtained from the 2004 Traffic Volumes on the California State Highway System available on the Caltrans website.

Traffic volume data sheets are available in the **Appendix**.

Existing Pedestrian and Bicycle Facilities

There are currently Class II bikeways (i.e. bicycle lanes) through project study intersections on Stony Point Road and Rohnert Park Expressway west of Labath Avenue and east of Commerce Boulevard. Furthermore, there are a Class I bikeways (i.e. multi-use paths) alongside Commerce Boulevard between Golf Course Drive and Redwood Drive as well as between Copeland Creek and East Cotati Avenue. There is another Class I bikeway along Golf Course Drive from Roberts Lake Road extending to the east.

According to the Rohnert Park General Plan, Class II bicycle lanes are planned for Redwood Drive, on Wilfred Avenue (within the city limits) when the road is improved in the future, Langner Avenue south of Wilfred Avenue, Gravenstein Highway (SR-116) east of Stony Point Road, and on Old Redwood Highway to Commerce Boulevard. A Class I bikeway is also planned along Commerce Boulevard between Golf Course Drive and Rohnert Park Expressway. Business Park Drive is a Class III bikeway (i.e. bike route) as well as Labath Avenue south of Business Park Drive.

Existing Transit Service

Sonoma County Transit operates several intra-city routes that pass through a transfer station near the intersection of Commerce Drive and Rohnert Park Expressway (immediately east of the US-101/Rohnert Park Expressway interchange). Intra-city routes include #10, #11, #12, and #14. Buses pass through the transfer station approximately every 30-40 minutes on weekdays and approximately every hour on weekends.

Sonoma County Transit also provides several inter-city routes that serve Sebastopol and Santa Rosa. Inter-city routes include #26, #44, and #48 and connect to a separate transfer station near the intra-city station. Bus frequencies are similar to intra-city service.

Golden Gate Transit operates routes along US-101 that pass through Rohnert Park and connect with cities including San Francisco, San Rafael, Petaluma, and Santa Rosa. During the weekday, routes #72, #74, #75, and #76 operate in the AM and PM peak travel directions and stop at the Rohnert Park inter-city transfer station. Route #80, which offers service all day long, also stops at the Rohnert Park station.

Currently Sonoma County Transit and Golden Gate Transit do not provide service near the site and have no plans to provide service. Serving the casino and hotel site would require a large route deviation and would impact the transit agencies ability to timely manage their current service area. Furthermore, the density in the vicinity of the project site is considered too low for cost-effective service.

A future opportunity for a connection to transit service is with Sonoma-Marin Area Rail Transit (SMART). The proposed rail service would connect San Francisco Bay ferry service terminals to Cloverdale (north of Santa Rosa). If implemented, the proposed rail corridor will pass through Rohnert Park with a stop at a station adjacent to the Wilfred Avenue interchange. The SMART project is planned to add a second track near the Wilfred interchange station. Trains could serve up to 13 other stations, 8 in Sonoma County and 5 in Marin, running every 30 minutes during peak periods, with up to 12-16 trains per day. A bicycle corridor is also proposed on the SMART right-of-way, which parallels US-101 for most of the distance. An Environmental Impact Report (EIR) was prepared to evaluate the impacts of the commuter rail service. If funding is secured, service could begin as early as 2007; however, voters rejected the proposed project in November of 2006 so the actual service start is uncertain.

Existing Collision History

Caltrans provided Kimley-Horn with a computer generated report summarizing accidents that occurred between 2002 and 2004 at the study intersections as well as on US-101 between Sierra Avenue and Todd Road. The reports provided information about each accident, including the direction of travel and the time of day. The data is helpful in determining any trends that may exist in the traffic accidents that have occurred over the three-year study period. The identification of such trends is crucial for an initial analysis of potential improvements to an intersection.

The summary data provided does have limitations when recommending improvements to the study intersections, to that end, the recommendations below are reflective of the analysis of the data provided to Kimley-Horn and our field observations at each study intersection and freeway segment.



Study Intersections

Stony Point Road/Wilfred Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>6</u>
	6

The prevailing accident trends at this intersection are broadside and rear-end mainly caused by traveling at unsafe speeds and improper turning.

Labath Avenue/Wilfred Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>2</u>
	2

The accident trends at this intersection are sideswipe and head-on accidents caused by right of way violation.

Redwood Drive/Wilfred Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>3</u>
	3

There was a sideswipe, a broadside, and a rear-end accident at this intersection caused by traveling at unsafe speeds or unsafe lane changes.

Redwood Drive/Commerce Boulevard.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	1
Vehicle/Vehicle	<u>25</u>
	26



The prevailing accident trends are rear-end and broadside accidents at this intersection caused by traveling at unsafe speeds, improper turning, or right of way violations.

Golf Course Drive/Commerce Boulevard.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>35</u>
	35

The prevailing accident trend is broadside accidents at this intersection caused by automobile right of way violation.

Golf Course Drive/Roberts Lake Road.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>7</u>
	7

The prevailing accident trend is sideswipe accidents at this intersection caused by traveling at unsafe speeds and improper turning.

Commerce Boulevard/US 101 NB Ramps.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>4</u>
	4

There was a sideswipe, a head-on, and a rear-end accident at this intersection caused by traveling at unsafe speeds or improper turning.



Redwood Drive/Business Park Drive.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>3</u>
	3

There were two rear-end accidents caused by traveling at unsafe speeds and improper starting/backing as well as one broadside accident at this intersection caused by automobile right of way violation.

Rohnert Park Expressway/Stony Point Road.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>5</u>
	5

There were an equal number of broadside and sideswipe accidents caused by traveling at unsafe speeds or automobile right of way violation.

Rohnert Park Expressway/Labath Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>4</u>
	4

The prevailing accident trend at this intersection is broadside accidents caused by traveling at unsafe speeds and automobile right of way violation.

Rohnert Park Expressway/Redwood Drive.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	1
Vehicle/Vehicle	<u>49</u>
	49

There are fairly equal number of broadside and rear-end accidents caused by traveling at unsafe speeds, right of way violation, and improper turning.



Rohnert Park Expressway/US 101 SB Ramps.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>31</u>
	31

The prevailing accident trend is rear-end collisions resulting from failure to comply with traffic signals and signs or unsafe speed.

Rohnert Park Expressway/US 101 NB Ramps.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>70</u>
	70

The prevailing accident trends are broadside and rear-end collisions resulting from failure to comply with traffic signals and signs, traveling at unsafe speeds, and improper turning.

Rohnert Park Expressway/Commerce Boulevard.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	2
Bicycle/Vehicle	4
Vehicle/Vehicle	<u>55</u>
	61

The prevailing accident trends are broadside and rear-end accidents that were caused by improper turning, traveling at unsafe speeds, and automobile right of way violation.

Gravenstein Highway (SR-116)/Stony Point Road.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>39</u>
	39



There are fairly equal amounts of rear-end, broadside, and sideswipe accidents at this intersection caused by traveling at unsafe speeds, improper turning, improper starting/backing, and automobile right of way violation.

Gravenstein Highway (SR-116)/Redwood Drive.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>18</u>
	18

The prevailing accident trends are rear-end and broadside accidents at this intersection caused by traveling at unsafe speeds and from failure to comply with traffic signals and signs.

Gravenstein Highway (SR-116)/ US 101 NB Off-Ramp.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	1
Vehicle/Vehicle	<u>9</u>
	10

The prevailing accident trend is rear-end accidents at this intersection caused by traveling at unsafe speeds and improper starting/backing.

Millbrae Avenue/Stony Point Road.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>8</u>
	8

The prevailing accident trend is rear-end accidents at this intersection caused by traveling at unsafe speeds and improper starting/backing.

Millbrae Avenue/Primrose Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>4</u>
	4



The prevailing accident trend is broadside accidents at this intersection caused by automobile right of way violation.

Millbrae Avenue/Whistler Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>2</u>
	2

There was a sideswipe and an overturned vehicle accident at this intersection caused by improper passing or improper turning.

Millbrae Avenue/Langner Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>5</u>
	5

The prevailing accident trend is broadside accidents at this intersection caused by automobile right of way violation.

Millbrae Avenue/Labath Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>1</u>
	1

There was a broadside accident at this intersection caused by improper starting/backing.

Millbrae Avenue/Dowdell Avenue.

<u>Accident Type</u>	<u>Number of Accidents</u>
Pedestrian/Vehicle	0
Bicycle/Vehicle	0
Vehicle/Vehicle	<u>1</u>
	1



There was a rear-end accident at this intersection caused by traveling at unsafe speeds.

There were no accidents at the following intersections during the three years studied:

- Primrose Avenue/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue.
- Gravenstein Highway (SR-116)/US 101 SB Ramps

Highway Segments

US-101 from Sierra Avenue to SR-116.

<u>Accident Type</u>	<u>Number of Accidents (Northbound)</u>	<u>Number of Accidents (Southbound)</u>
Broadside	0	0
Rear-End	14	11
Sideswipe	3	0
Other	<u>5</u>	<u>7</u>
	22	18

The prevailing accident trend is rear-end accidents throughout this freeway segment caused by traveling at unsafe speeds, following too closely, and improper turning.

US-101 from SR-116 to Rohnert Park Expressway.

<u>Accident Type</u>	<u>Number of Accidents (Northbound)</u>	<u>Number of Accidents (Southbound)</u>
Broadside	41	1
Rear-End	63	46
Sideswipe	9	5
Other	<u>26</u>	<u>7</u>
	139	59

The prevailing accident trend is rear-end accidents throughout this freeway segment caused by traveling at unsafe speeds, following too closely, and improper turning.



US-101 from Rohnert Park Expressway to Wilfred Avenue.

<u>Accident Type</u>	<u>Number of Accidents (Northbound)</u>	<u>Number of Accidents (Southbound)</u>
Broadside	6	5
Rear-End	45	36
Sideswipe	9	12
Other	<u>13</u>	<u>11</u>
	73	64

The prevailing accident trend is rear-end accidents throughout this freeway segment caused by traveling at unsafe speeds and improper turning.

US-101 from Wilfred Avenue to Santa Rosa Avenue.

<u>Accident Type</u>	<u>Number of Accidents (Northbound)</u>	<u>Number of Accidents (Southbound)</u>
Broadside	0	1
Rear-End	33	53
Sideswipe	10	18
Other	<u>4</u>	<u>23</u>
	47	95

The prevailing accident trend is rear-end accidents throughout this freeway segment caused by traveling at unsafe speeds, following too closely and improper lane changes.

US-101 from Santa Rosa Avenue to Todd Road.

<u>Accident Type</u>	<u>Number of Accidents (Northbound)</u>	<u>Number of Accidents (Southbound)</u>
Broadside	6	1
Rear-End	43	32
Sideswipe	6	12
Other	<u>23</u>	<u>10</u>
	78	55

The prevailing accident trend is rear- accidents throughout this freeway segment caused by traveling at unsafe speeds, following too closely and improper lane changes.

Caltrans provided accident data from “Table B” of the Traffic Accident Surveillance and Analysis System (TASAS) for 2002 to 2004. Actual and average accident rates are shown in **Table 3**. It should be noted that the collision history summarized above and accident rates are from a couple of years before the counts were conducted. During the time between the accident history and the counts, improvements were made to some of

the locations. The US-101 NB Off-Ramp/Rohnert Park Expressway intersection, for example, has been improved since the accident rate data was collected.

Table 3 – Accident Rate Data

Location	Number of Accidents					Accident Rate (acc/mv*)					
	Total	Fat.	Inj.	Wet	Dark	Actual			Average		
						Fat.	F+I	Total	Fat.	F+I	Total
101 NB off to SR-116	5	0	1	0	0	0.00	0.14	0.70	.005	0.61	1.50
101 NB off to Rohnert Park Exp.	66	0	15	13	13	0.00	1.79	7.89	.005	0.61	1.50
101 SB on from Rohnert Park Exp.	15	0	5	3	3	0.00	0.64	1.93	.002	.032	0.80
101 NB on from Rohnert Park Exp.	15	0	5	3	7	0.00	0.63	1.89	.002	0.32	0.80
101NB off to Commerce Blvd	4	0	1	0	2	0.00	0.18	0.72	.005	0.39	1.15
101 SB on from Wilfred Ave	1	0	0	1	1	0.00	0.00	0.18	.002	0.20	0.60
101 NB on from Commerce	2	0	0	0	0	0.00	0.00	0.20	.002	0.20	0.60
101SB off to Wilfred Ave	8	0	2	2	1	0.00	0.17	0.70	.005	0.39	1.15

*acc/mv = accident per million vehicles

Existing Levels of Service at Study Intersections

Traffic operations were evaluated under existing traffic conditions. As noted previously LOS C or better is established as the criteria for satisfactory operation at intersections within the City of Rohnert Park, with the exception of the following study area intersections that are permitted to operate at LOS D.

- Wilfred Avenue / Redwood Drive
- Wilfred Avenue / US-101 SB Ramps
- Golf Course Drive / Commerce Boulevard
- US-101 NB Ramps / Commerce Boulevard

Intersections that are already operating at LOS D or lower are permitted if no feasible improvements exist to improve the LOS and provided that LOS is not permitted to deteriorate further due to the proposed development project.

LOS D or better is established as the criteria for satisfactory operation at intersections within Sonoma County. Project intersections currently operating below the county standard are considered to be significantly impacted if the average delay per vehicle increases by 5 seconds or more.

LOS D or better is established as the criteria for satisfactory operation at intersections at freeway ramp terminals, freeway segments and ramps (unless specifically noted otherwise above). Intersections currently operating less than the established LOS are expected to maintain the existing measure of effectiveness (i.e. delay per vehicle at intersections and density for ramps and freeway segments).

Results of the analysis are presented in **Table 4**, along with the jurisdictional standard for acceptable level of service (as previously described on p. 2 in Operating Conditions and Criteria). The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. The worst approach is reported because as stated in the *Highway Capacity Manual*, "the LOS criteria for two-way stop-controlled (TWSC) intersections are different from the criteria for signalized intersections primarily because different transportation facilities create different driver perceptions. The expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay than an unsignalized intersection. LOS for a TWSC intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole. At TWSC intersections the critical movement may control the overall performance of the intersection." Additional detail of the analysis is provided in the **Appendix**. Results of the analysis indicate some existing study area intersections currently operate at unacceptable levels of service based on established significance criteria. (Results shown as bold in the table do not meet operational standards.)

**Table 4 – Existing Levels of Service**

	Intersection	Criteria	Signal Control	2005	
				LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1
9	Wilfred Ave/ US-101 SB Ramps	D	-	-	-
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0
14	Business Park Dr/ Labath Ave	D	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3

Intersections and approaches not meeting standards include the following:

- Stony Point Road/Wilfred Avenue
- Redwood Drive/Commerce Boulevard
- Golf Course Drive/Commerce Boulevard
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

Existing Conditions Traffic Signal Warrant Analysis

Traffic signals may be justified when traffic operations fall below acceptable thresholds and when one or more signal warrants are satisfied.

Existing traffic volumes at the unsignalized study intersections were compared against the peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*. Traffic Signal Warrant #3 – Peak Hour Volume Warrant (formerly known as Warrant #11) is satisfied when traffic volumes on the major and minor approaches exceed thresholds for one hour of the day. As specified in the *MUTCD* and *California Supplement*, predetermined minimum thresholds for intersections include volume on the minor street of 100 vehicles per hour for one moving lane of traffic and 150 vehicles per hour for two moving lanes of traffic as well as the total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches and 800 vehicles per hour for intersections with four or more approaches.

This warrant is generally the first warrant to be satisfied. The warrant applies to traffic conditions during a one hour peak that are sufficiently high such that minor street traffic experiences excessive delay in entering and crossing the street due to the high traffic volumes on the main street.

Results of the analysis showed that the following intersections currently satisfy Warrant #3:

- Stony Point Road/Wilfred Avenue
- Stony Point Road/Millbrae Avenue

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Existing Levels of Service at Freeway Segments and Ramps

Existing traffic volumes on US-101 near the project site were collected using digital wave radar technology to measure vehicle volume and speed per lane. For less critical traffic information at locations farther from the project site, the information was obtained from the Caltrans website.

Traffic analyses were completed to evaluate the existing weekday operation of the study segments and ramps. Results of the analyses are presented in **Table 5**. (Results shown as bold in the table do not meet operational standards.)

Table 5 – Existing US-101 Levels of Service

Existing

US-101 Section/Ramp	Criteria	Existing	
	LOS	LOS	Density (pc/mi/ln)
Northbound			
US-101 South of Gravenstein Highway (NB)	E	C	22.2
Gravenstein Highway NB Off-Ramp	E	D	30.8
Gravenstein Highway NB On-Ramp	E	D	34.5
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1
Rohnert Park Expressway NB Off-Ramp	E	D	33.6
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1
Rohnert Park Expressway NB On-Ramp	E	D	32.5
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9
Wilfred Avenue NB Off-Ramp	E	E	35.4
Wilfred Avenue NB On-Ramp	E	F	42.0
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7
Santa Rosa Avenue NB Off-Ramp	E	E	37.2
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3
Southbound			
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9
Santa Rosa Avenue SB On-Ramp	E	D	31.2
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5
Wilfred Avenue SB Off-Ramp	E	E	38.0
Wilfred Avenue SB On-Ramp	E	D	33.7
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2
Rohnert Park Expressway SB Off-Ramp	E	E	38.0
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0
Rohnert Park Expressway SB On-Ramp	E	E	35.1
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1
Gravenstein Highway SB Off-Ramp	E	D	33.9
Gravenstein Highway SB On-Ramp	E	D	33.7
US-101 South of Gravenstein Highway (SB)	E	C	24.7

Results of the analysis indicate that the northbound on-ramp at Wilfred Avenue currently operates at unacceptable levels of service based on established significance criteria.

NO ACTION ALTERNATIVE

The No Action Alternative represents the evaluation of traffic conditions without the construction of the proposed casino and hotel. Traffic conditions were evaluated for the near-term (2008) and the long-term (2020). 2008 analysis corresponds with the proposed opening year of the casino and hotel. 2020 analysis represents cumulative traffic conditions for the area based upon available traffic forecasts from the Sonoma County travel forecast model provided by the Sonoma County Regional Transportation Authority (SCTA). SCTA made refinements in Rohnert Park to the roadways and TAZs from the most recent information from the Sonoma County General Plan, the Rohnert Park General Plan, and the adopted specific plan assumptions.

The No Action Alternative serves as a baseline for comparison to each of the project alternatives, including the Wilfred Avenue site (Alternative A). It is assumed that if the site is not developed as a casino, it will be built out as it was planned in the Rohnert Park General Plan, the Northwest Specific Plan, and the Wilfred-Dowdell Specific Plan.

Proposed Roadway Projects in Vicinity of Site

Several major projects are planned in the future that may affect traffic conditions near the project site. These projects are planned to be completed regardless of the proposed casino and hotel.

Caltrans plans to reconstruct the US-101/Wilfred Avenue interchange. The change will connect Golf Course Drive directly with Wilfred Avenue and raise the freeway over the new street connection. Commerce Drive under the freeway (between Golf Course Drive and Redwood Drive) will be removed in the long-term but will remain in the near-term. The project will also include other widening and intersection improvements.

With the reconstruction of the US-101/Wilfred Avenue interchange, the southbound on-ramp at Santa Rosa Avenue will join with the southbound off-ramp traffic at Wilfred Avenue to a distributor/collector road and will enter the freeway with the southbound on-ramp traffic at Wilfred Avenue.

Also with the reconstruction of the US-101/Wilfred Avenue interchange, auxiliary lanes will be constructed from the Rohnert Park Expressway Overcrossing to the Wilfred Avenue interchange and northbound from Wilfred Avenue to Santa Rosa Avenue Overcrossing. The existing northbound and southbound on-ramps at Wilfred Avenue will be widened for ramp metering which will be installed with the completion of the interchange.

According to Caltrans, the interchange will remain open during construction, including the freeway ramps. The project will be constructed in three general phases:

1. Build collector-distributor road from Santa Rosa interchange and southbound on-ramp.
2. Demolish and build northbound structures.
3. Demolish and build southbound structures.

Environmental studies for the proposed interchange project are completed and design is currently in progress with reconstruction planned to begin in 2008 and be completed by 2011. Because the interchange is expected to be completed at approximately the same time as the casino, it was assumed that the US-101/Wilfred Avenue interchange was completed in the 2008 analysis scenarios.

The analysis in this report is based off of the most current information received from Caltrans (at the time the report was prepared). However, it should be noted that the final configuration of the interchange is still being developed and may result in a configuration slightly different from what is analyzed in this report.

Caltrans also plans to add high occupancy vehicle lanes (HOV) to the US-101 freeway from SR-37 through Santa Rosa. HOV lane projects near the site are as follows:

- HOV lanes on US-101 from Old Redwood Highway (in Petaluma) to Rohnert Park Expressway. Construction would start approximately 2009 or 2010. Environmental studies are currently underway but actual construction may be delayed due to funding limitations.
- HOV lanes on US-101 from Rohnert Park Expressway to Wilfred Avenue. This project is to be completed at the same time as the Wilfred Avenue interchange. Environmental studies are currently underway but actual construction may be delayed due to funding limitations.
- HOV lanes on US-101 from Wilfred Avenue to SR-12 (Santa Rosa). This project was completed in 2003.

Other intersection projects are identified in the Rohnert Park General Plan. Some of the projects are intended to increase intersection capacities near the US-101 interchanges. Wilfred Avenue will be widened to four lanes plus left turn lanes from the 1999 City Limits to the Urban Growth Boundary (at Langner Avenue). The left turn lanes on Wilfred Avenue were assumed to be 150 feet long. In addition, the city plans to construct an overpass across US-101 that connects Business Park Drive to the west with State Farm Drive to the east. Exact configuration of the overpass has not been determined by the city; therefore, lane geometry in this evaluation was assumed based on engineering judgment.

The overpass is expected to be used by few casino and hotel visitors but would help to relieve congestion from the Wilfred Avenue and Rohnert Park Expressway

interchanges, which, in turn, would make available additional capacity at the interchanges for the casino/hotel and other traffic growth.

Proposed Development Projects in Vicinity of Sites

No specific development projects were identified as being constructed by the year 2008; however, near-term traffic growth in the study area was prorated based on long-term traffic forecast information provided by Sonoma County Transportation Authority (SCTA). The assumed traffic growth included the Green Music Center and Northwest Specific Plan area east of the proposed casino for future high-density residential, industrial, business park, and regional commercial development as well as other developments. It was assumed in this study that the designated areas would be developed per the Rohnert Park General Plan, the Northwest Specific Plan, and the Wilfred-Dowdell Specific Plan.

Near-Term Lane Configurations and Traffic Control

As discussed above, roadway improvements are planned for the study intersections, particularly at or near the US-101 interchanges. Some improvements are anticipated to be in place before or at approximately the same time as the proposed opening year of the casino and hotel. **Figure 4** illustrates the roadway geometry and traffic control expected to be in place in 2008 regardless of the casino and hotel. Some projects, including the planned reconstruction of the Wilfred Avenue interchange, are expected to occur before or at the same time as the proposed opening of the casino and hotel.

Near-Term Traffic Volumes (No Project)

To reflect the traffic levels anticipated to occur in the year 2008, Kimley-Horn obtained from SCTA base year and cumulative forecast year data for roadways in the study area. The prorated incremental increase in traffic volumes that reflects growth from 2005 to 2008 (from the forecast model) was added to existing traffic volumes to determine near-term cumulative volumes by intersection approach. Approach volumes were then converted to turning movement volumes using a Furness process. Lastly, some turn movements were manually adjusted to balance traffic between intersections or correct for forecast model inconsistencies. The rate of increase per year differs widely based on the roadway segment and the proximity to anticipated development. On average, the increase in traffic volume is roughly 2 percent per year. **Figure 5** shows the assumed increase in background traffic at the study intersections. These volumes represent anticipated traffic levels in the year 2008, regardless of the proposed casino and hotel.

Long-Term Lane Configurations and Traffic Control

Additional roadway improvements are expected within the project study area by the year 2020 including the completion of the HOV lanes on US-101, the overpass across US-101 that connects Business Park Drive to the west with State Farm Drive to the east, and the widening of Wilfred Avenue to four lanes with turn lanes from the 1999

City Limits to the Urban Growth Boundary (Langner Avenue) after the area is annexed by the City. **Figure 6** illustrates the intersection geometry and traffic control assumed in the long-term analysis.

Long-Term Cumulative Forecast (No Project)

Additional development projects in the vicinity of the site are expected to be completed by the year 2020 and will contribute to a cumulative increase in background traffic regardless of the casino and hotel. These projects include growth in residential, industrial, business park, and commercial land uses located within the city's Urban Growth Boundary, east of the project site. This land use growth, along with other development in the City of Rohnert Park and Sonoma County comprise the long-term cumulative traffic forecast. The cumulative forecast for this study is based on the year 2020 modeling which is consistent with the land use assumptions contained in the Sonoma County General Plan, Rohnert Park General Plan, and other applicable specific plans. Kimley-Horn worked with SCTA to obtain base year and cumulative forecast year data for roadways in the study area. The incremental increases in traffic volumes (from the forecast model) were added to existing traffic volumes to determine long-term cumulative volumes by intersection approach. Approach volumes were then converted to turning movement volumes using a Furness process. Lastly, some turn movements were manually adjusted to balance traffic between intersections or correct for forecast model inconsistencies. **Figure 7** shows the long-term cumulative traffic volumes.

LOS Conditions and Impacts

Traffic operations were evaluated under the following development conditions:

- Near-term conditions without project (year 2008)
- Long-term Cumulative conditions without project (year 2020)

Results of the analysis are presented in **Table 6**. The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As seen in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria, regardless of the casino and hotel project. (Results shown as bold in the table do not meet operational standards.)

At the intersection of Rohnert Park Expressway/US 101 SB Ramps, between near-term and long-term, the level of service slightly improves as a result of the installation of the overpass across US-101 connecting Business Park Drive with State Farm Drive. The overpass helps relieve traffic volumes away from the interchanges. On the other hand, there is a large increase in delay between the near-term and the long-term at the

intersection of Wilfred Avenue/Redwood Drive due to the different lane geometry currently proposed for the new Wilfred Avenue interchange. Similar changes occur in Alternatives A through E.

2008 Results

- Stony Point Road/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

2020 Results

- Stony Point Road/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

As noted in the table, significant delays are expected, particularly at the Wilfred Avenue/Stony Point Road intersection and on Wilfred Avenue from Labath Avenue to Redwood Drive, regardless of the proposed casino and hotel project.

Traffic Signal Warrant Analysis

Near-term and long-term traffic volumes (without the project) at unsignalized study intersections were compared against the peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersection will satisfy traffic signal Warrant #3 by the year 2008 and 2020, regardless of the proposed project.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Labath Avenue/Wilfred Avenue (2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant



thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.



Table 6 – No Action Levels of Service

	Intersection	Criteria	Signal Control	2005		2008		2020	
				Existing		Base (w/o Proj.)		Base (w/o Proj.)	
				LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	841.3
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	12.5
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	12.5
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	B	12.5
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	169.9
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	26.8
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	E	74.2
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	19.0
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	D	50.8
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	B	18.5
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	28.2
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	29.1
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.0
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	12.3
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	E	63.4
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	45.5
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	D	42.4
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	18.1
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.5
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	90.2
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	12.4
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	12.5
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.7

LOS Conditions and Impacts on Freeway and Ramps

Year 2010 and year 2030 freeway forecast information was provided by Caltrans within the study area. The year 2010 forecasts reported volumes for freeway travel lanes operating as mixed-use lanes; whereas, the 2030 forecast separated the data for mixed-use and HOV lanes, to reflect the completion of the US-101 HOV lane project.

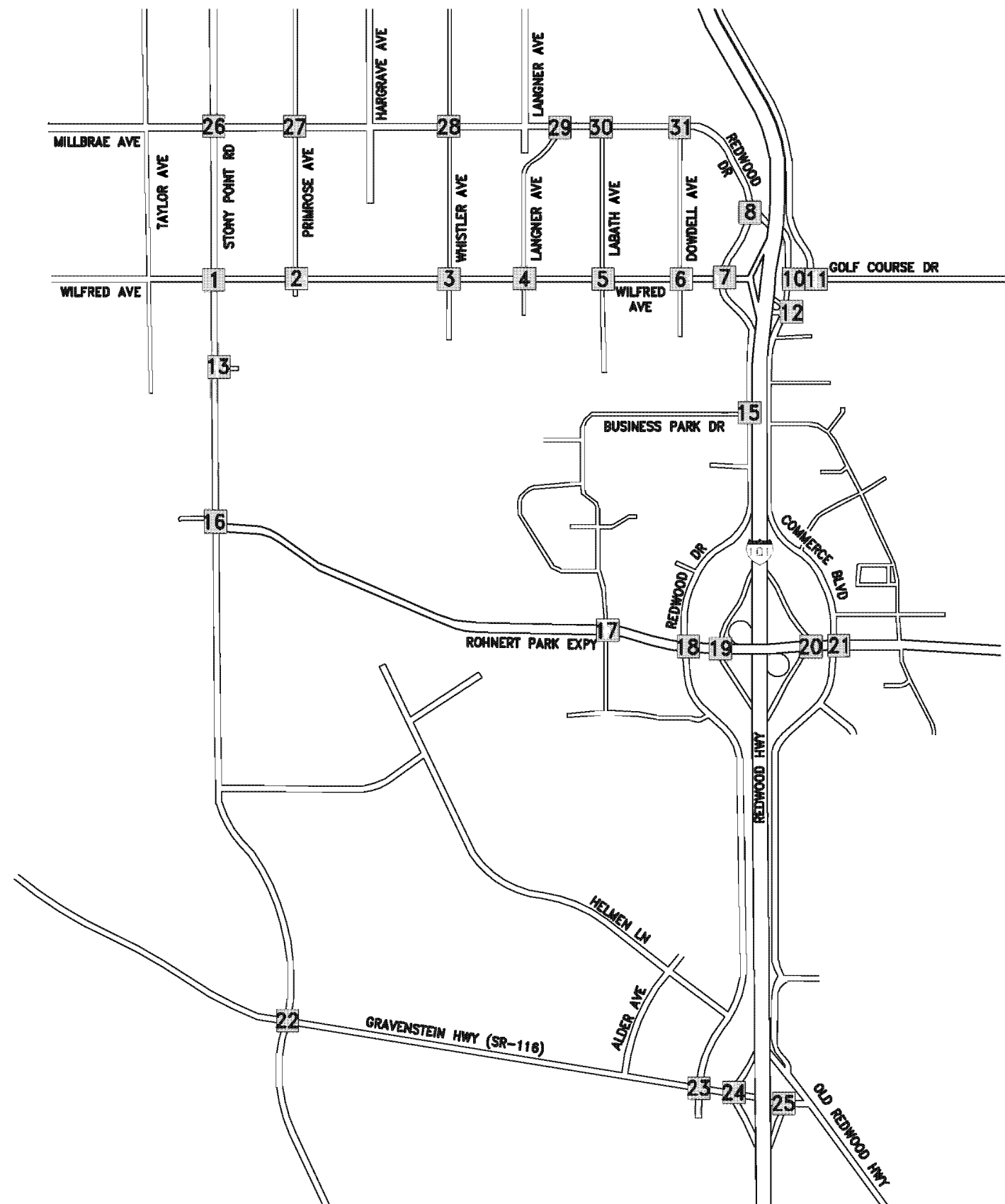
Because this study is using different analysis years, growth rates were determined from the Caltrans data and then applied to the freeway traffic counts to generate a 2008 and 2020 freeway forecast. On-ramp volumes were obtained from the Sonoma County travel forecast model.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020. Freeway segment analyses were limited to the mix-use travel lanes, which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table 7**. As shown in the table, all of the freeway segments and on/off ramps are expected to operate at acceptable levels of service based on established significance criteria in the near-term. In the cumulative condition there are some segments and ramps that operate at unacceptable levels of service in the southbound direction. These levels of service are anticipated to occur even with the completion of the HOV lane project through Rohnert Park and the new auxiliary lanes. (Results shown as bold in the table do not meet operational standards.)

Table 7 – No Action Alternative Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2020	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound							
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	25.6
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	34.1
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	E	36.1
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	32.3
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	E	37.1
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	23.2
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	29.0
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	29.0
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	29.0
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	E	40.4
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	E	40.4
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	E	40.4
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	D	29.7
Southbound							
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	28.5
Santa Rosa Avenue SB On-Ramp	E	D	31.2				
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	F	44.8
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	39.9
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	39.9
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	39.9
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	E	38.5
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	F	37.5
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	E	36.6
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	F	40.3
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	F	42.3
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	32.0

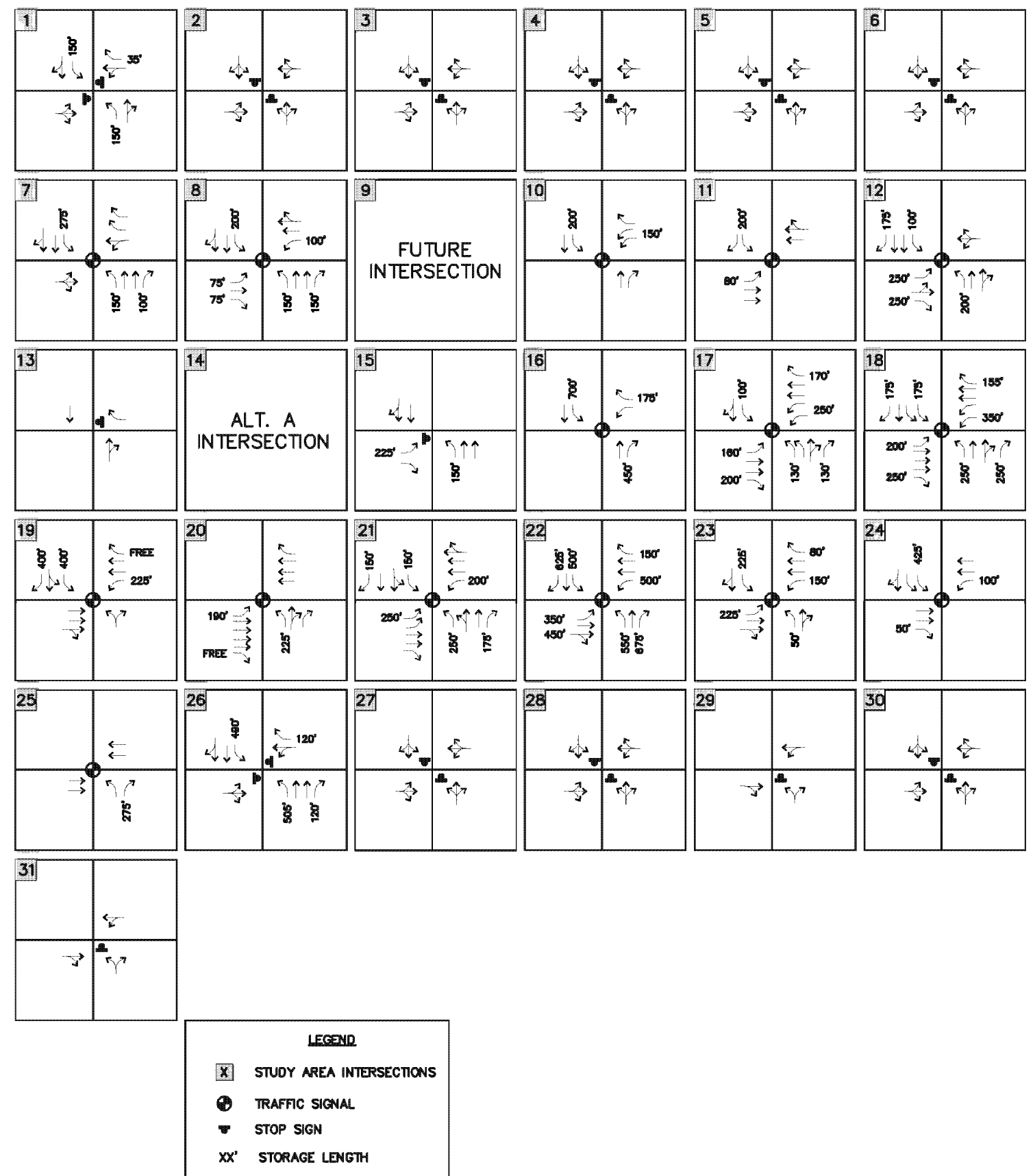
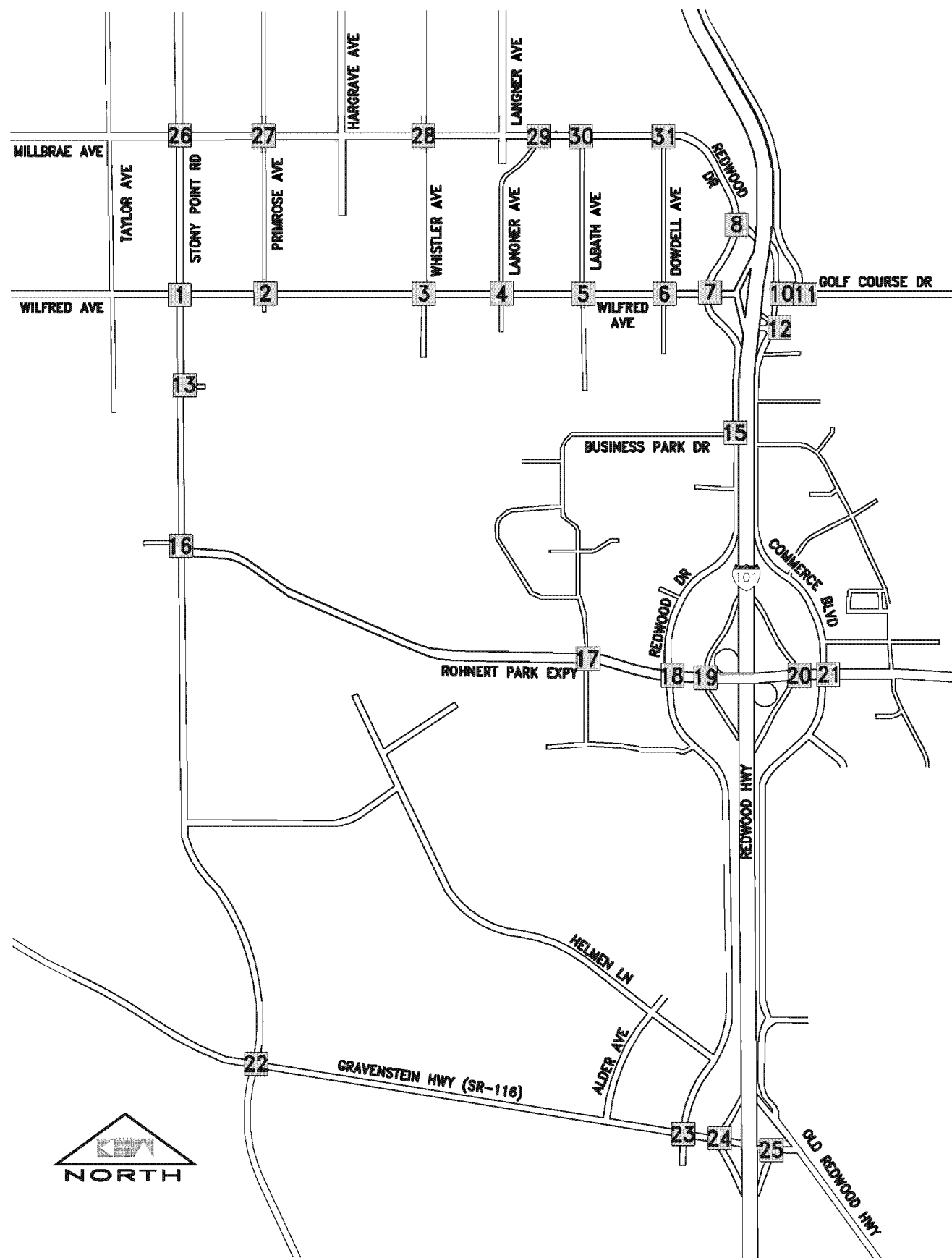


Graton Rancheria No Project – Rohnert Park, CA

PROJECT STUDY INTERSECTIONS

FIGURE 1



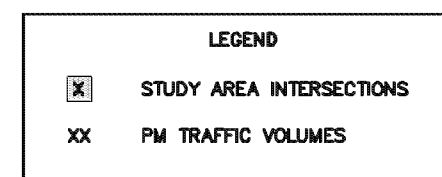
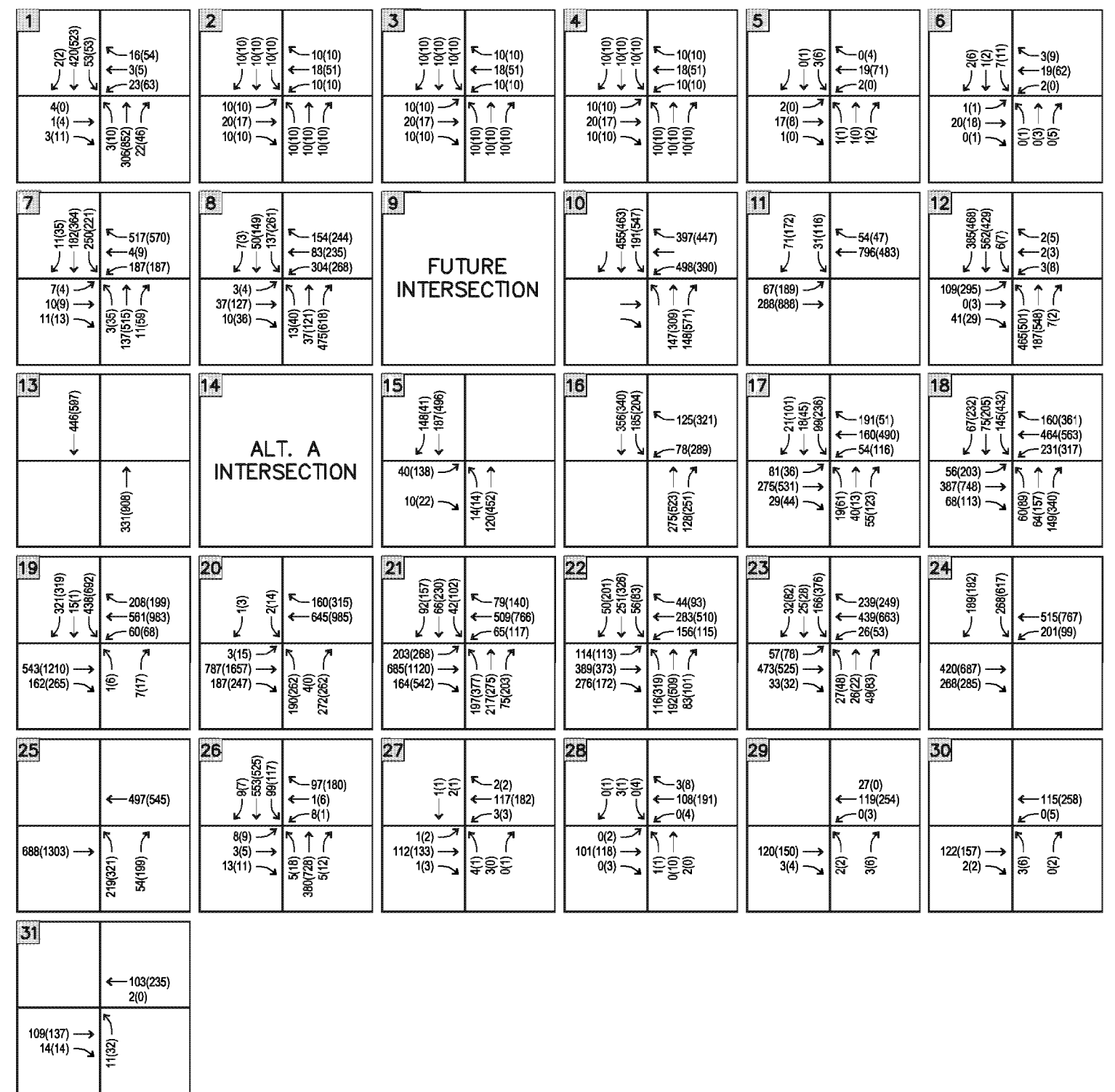
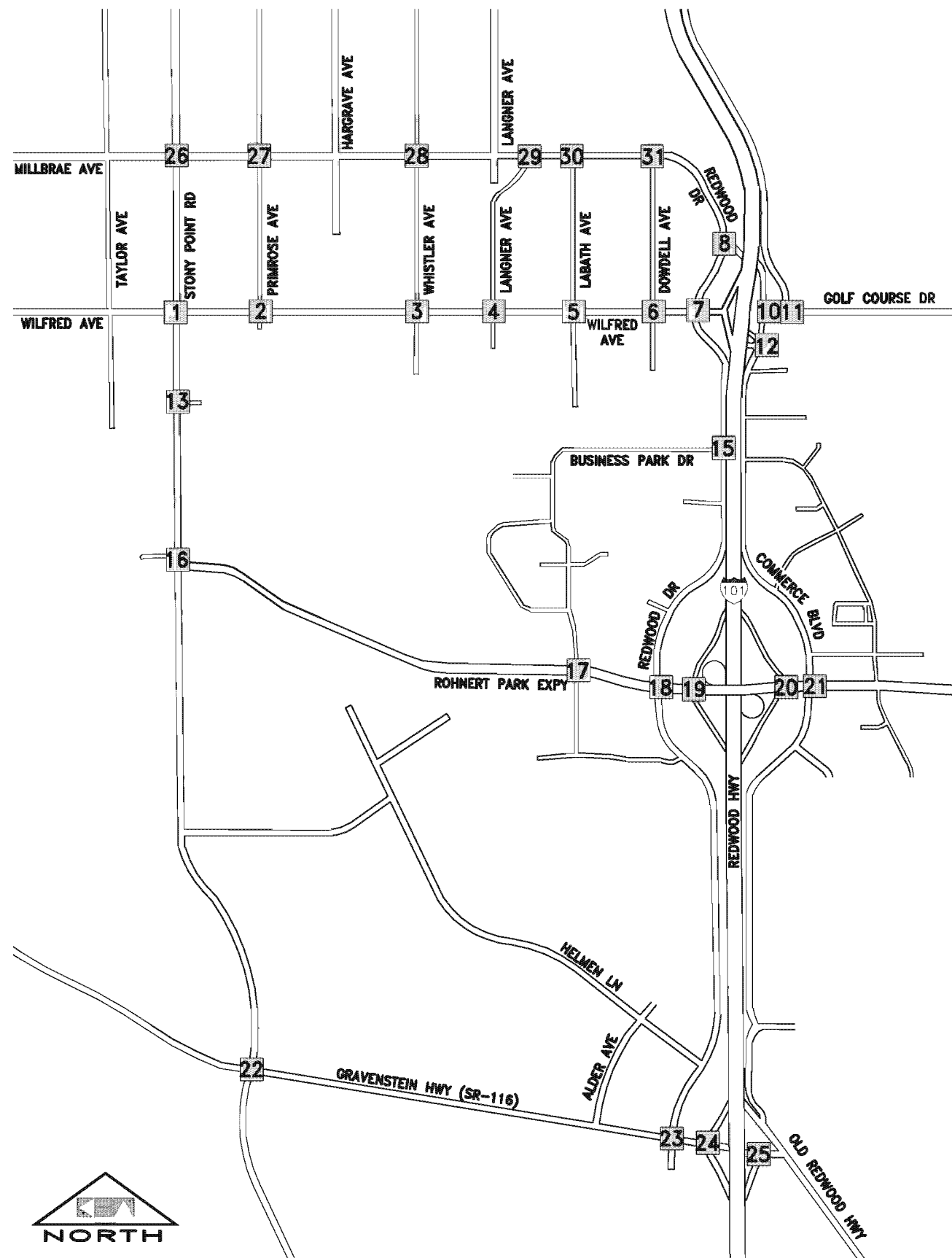


Graton Rancheria No Project – Rohnert Park, CA

EXISTING LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE 2



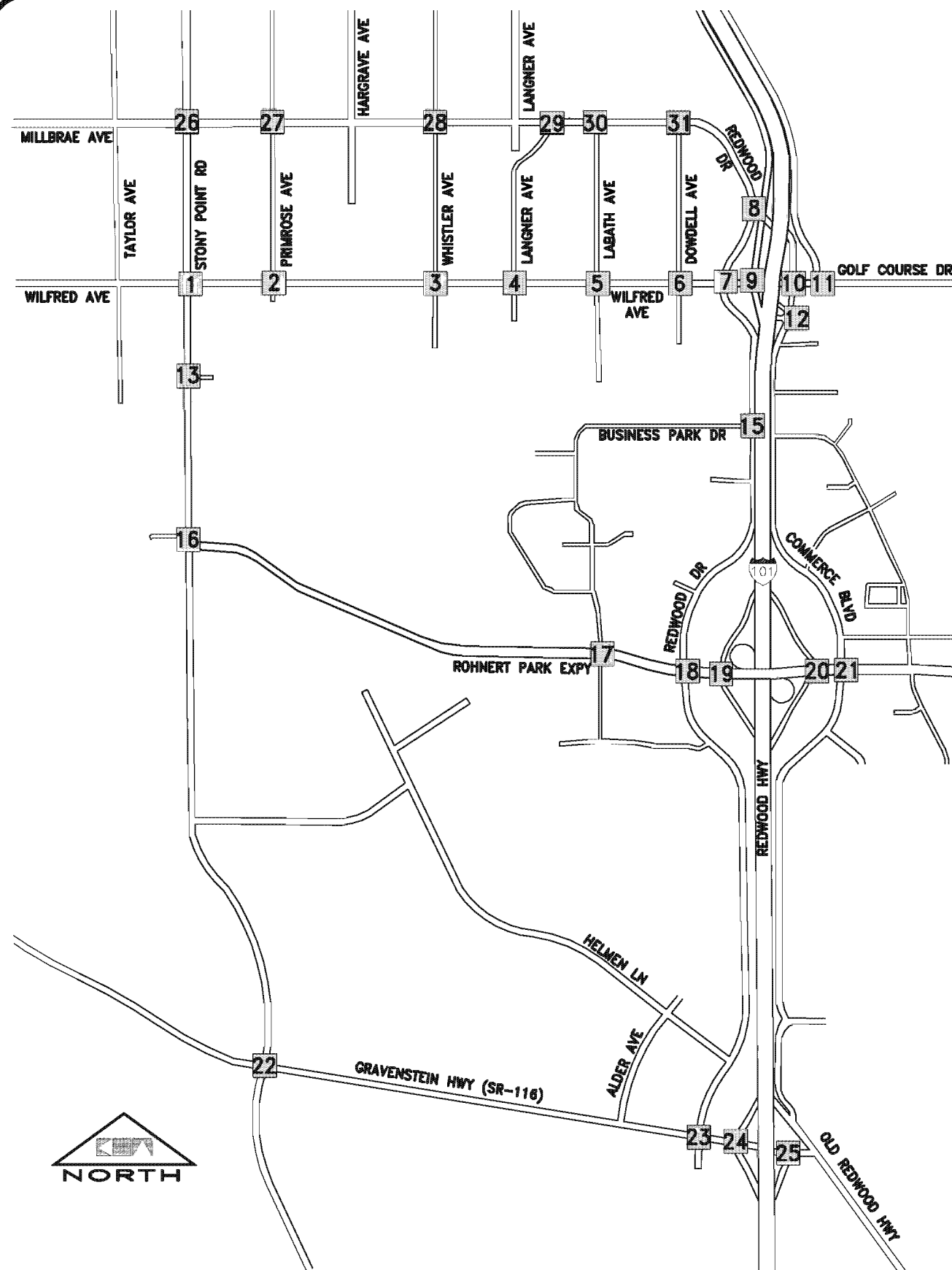


Graton Rancheria No Project - Rohnert Park, CA

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES

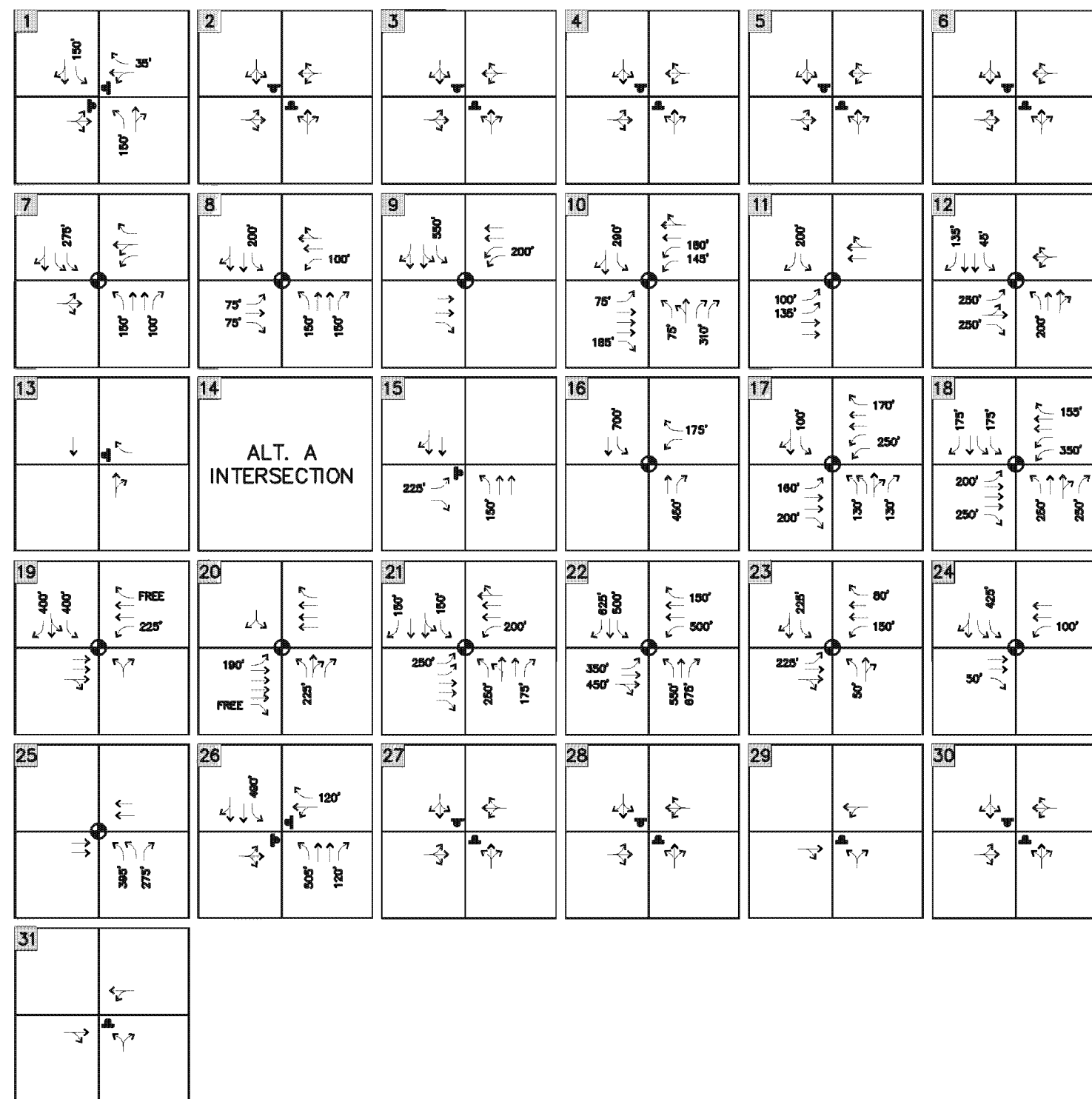
FIGURE 3





Graton Rancheria No Project – Rohnert Park, CA

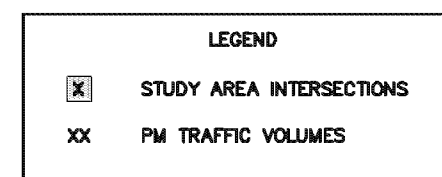
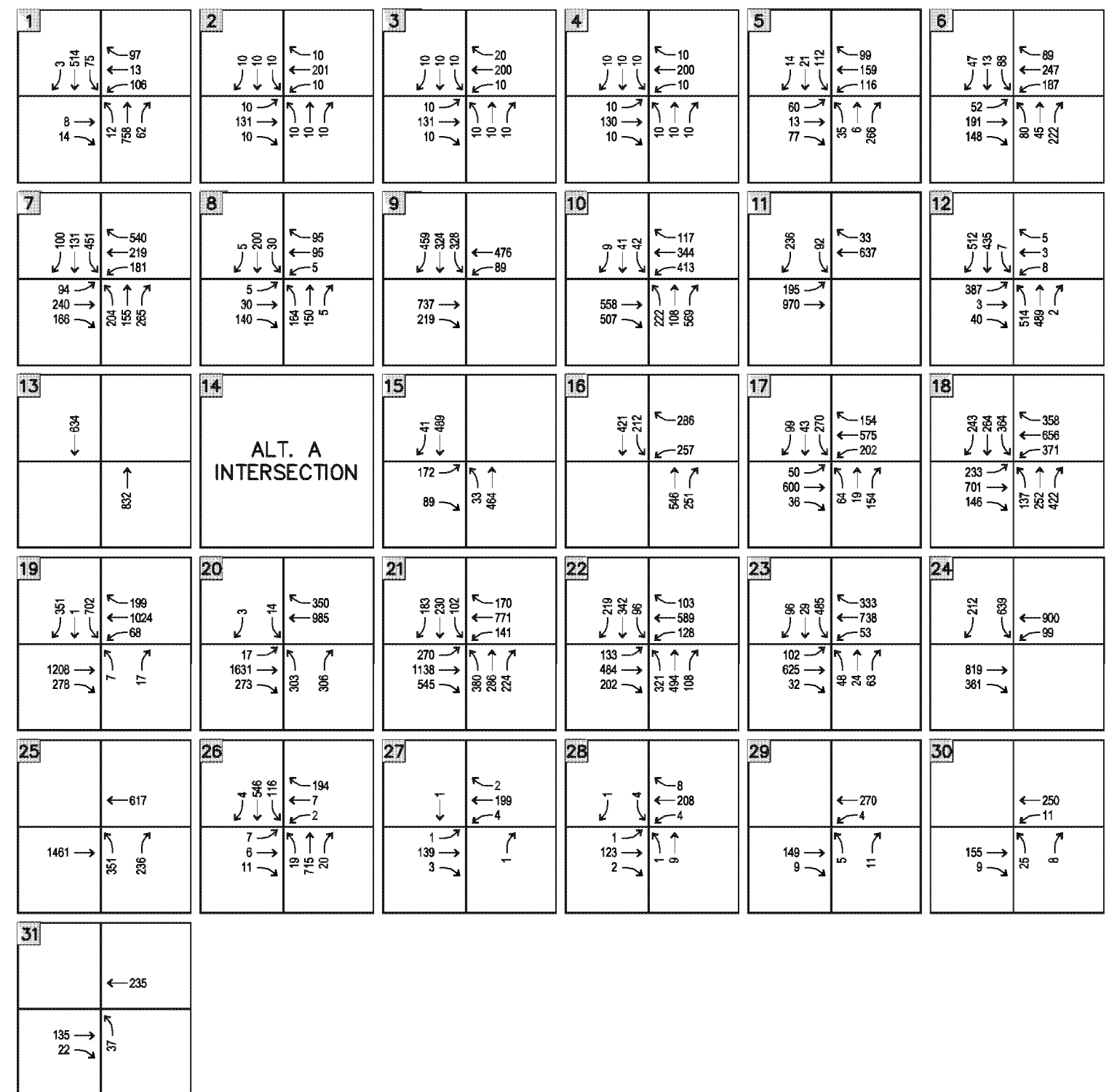
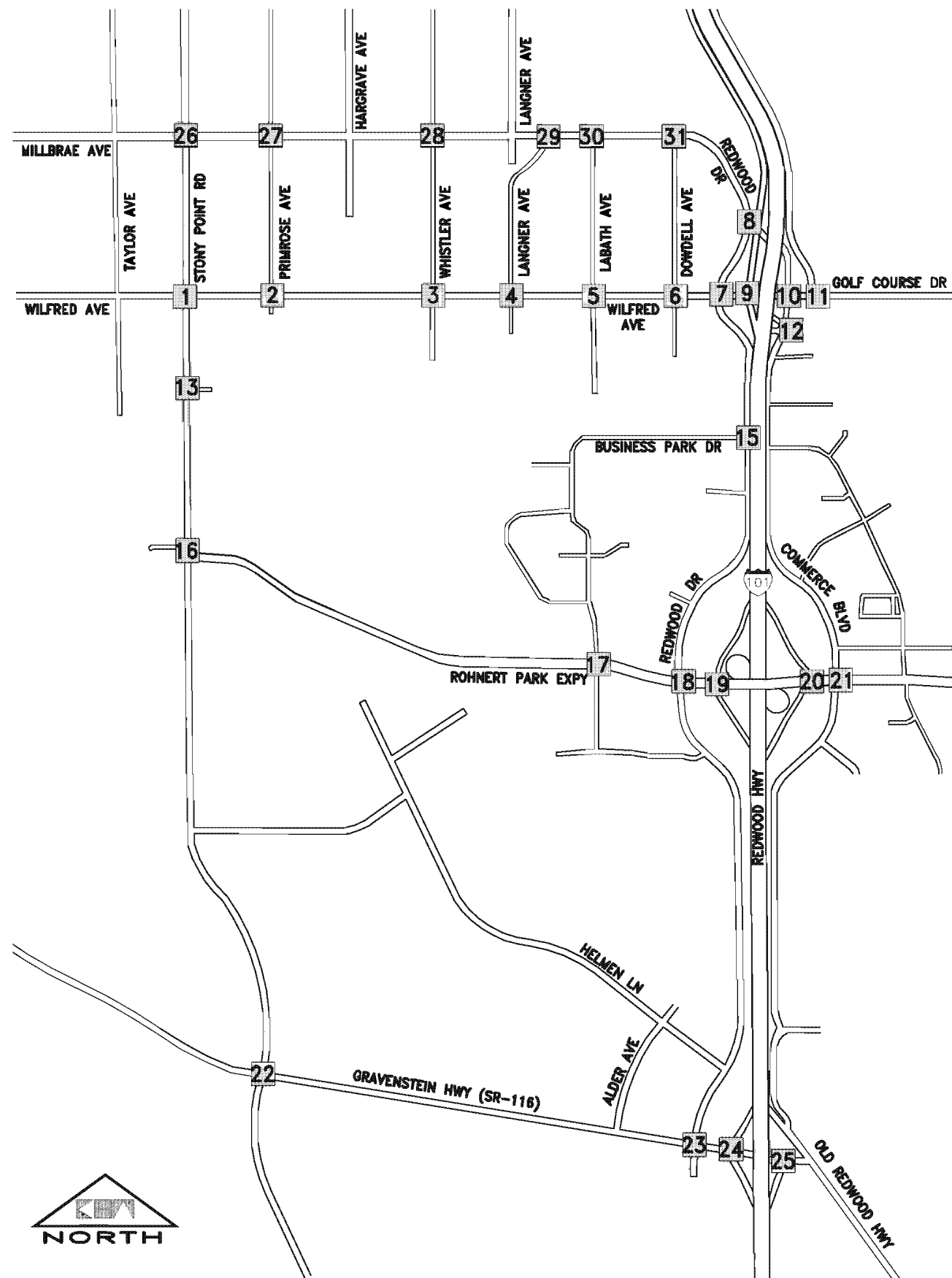
NEAR-TERM LANE GEOMETRY AND TRAFFIC CONTROL



LEGEND

- STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- XX' STORAGE LENGTH

FIGURE 4

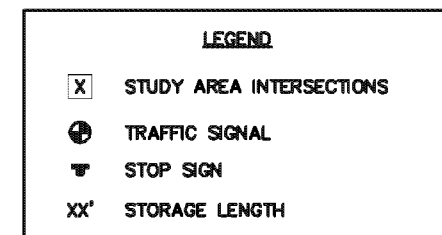
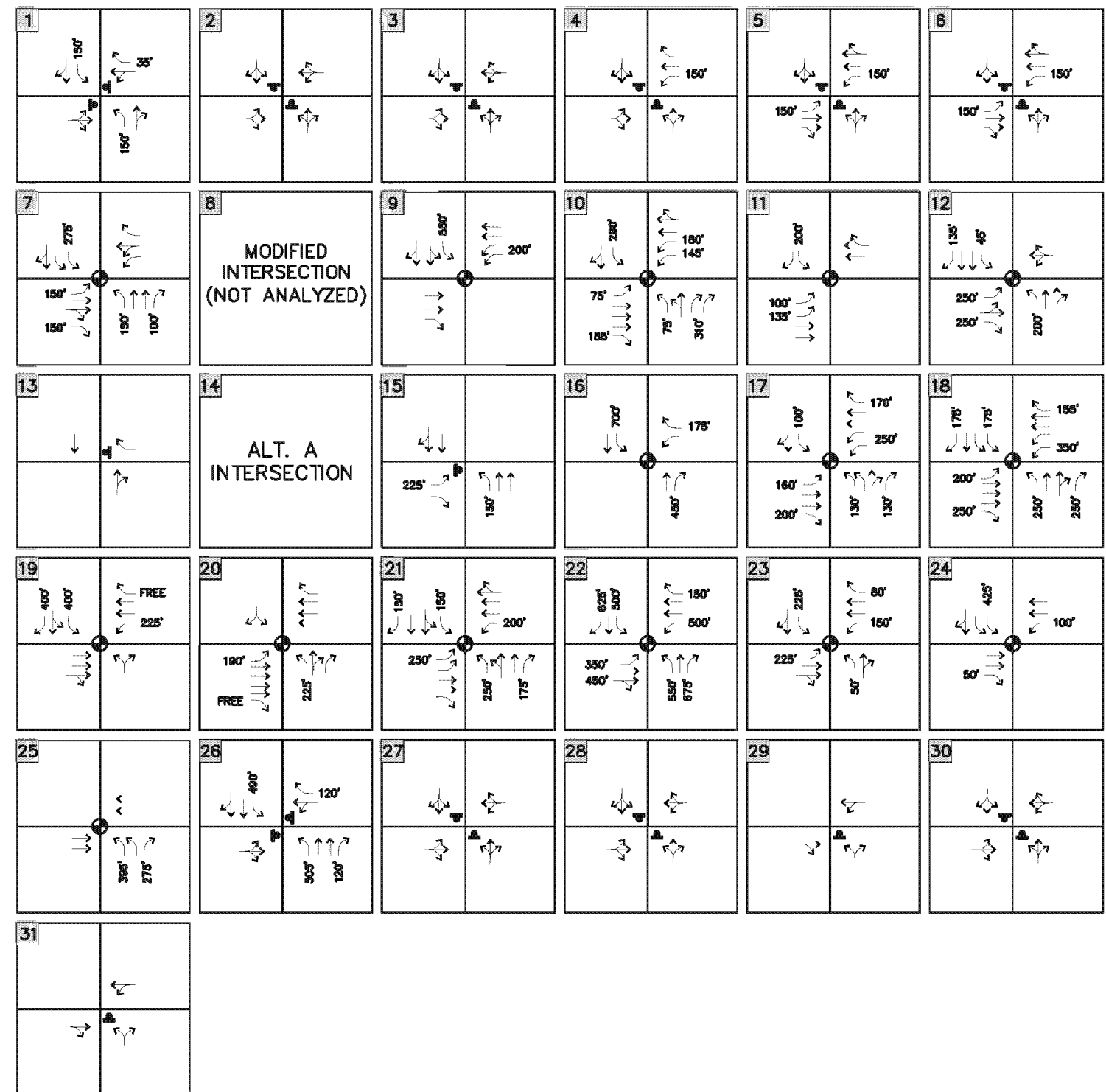
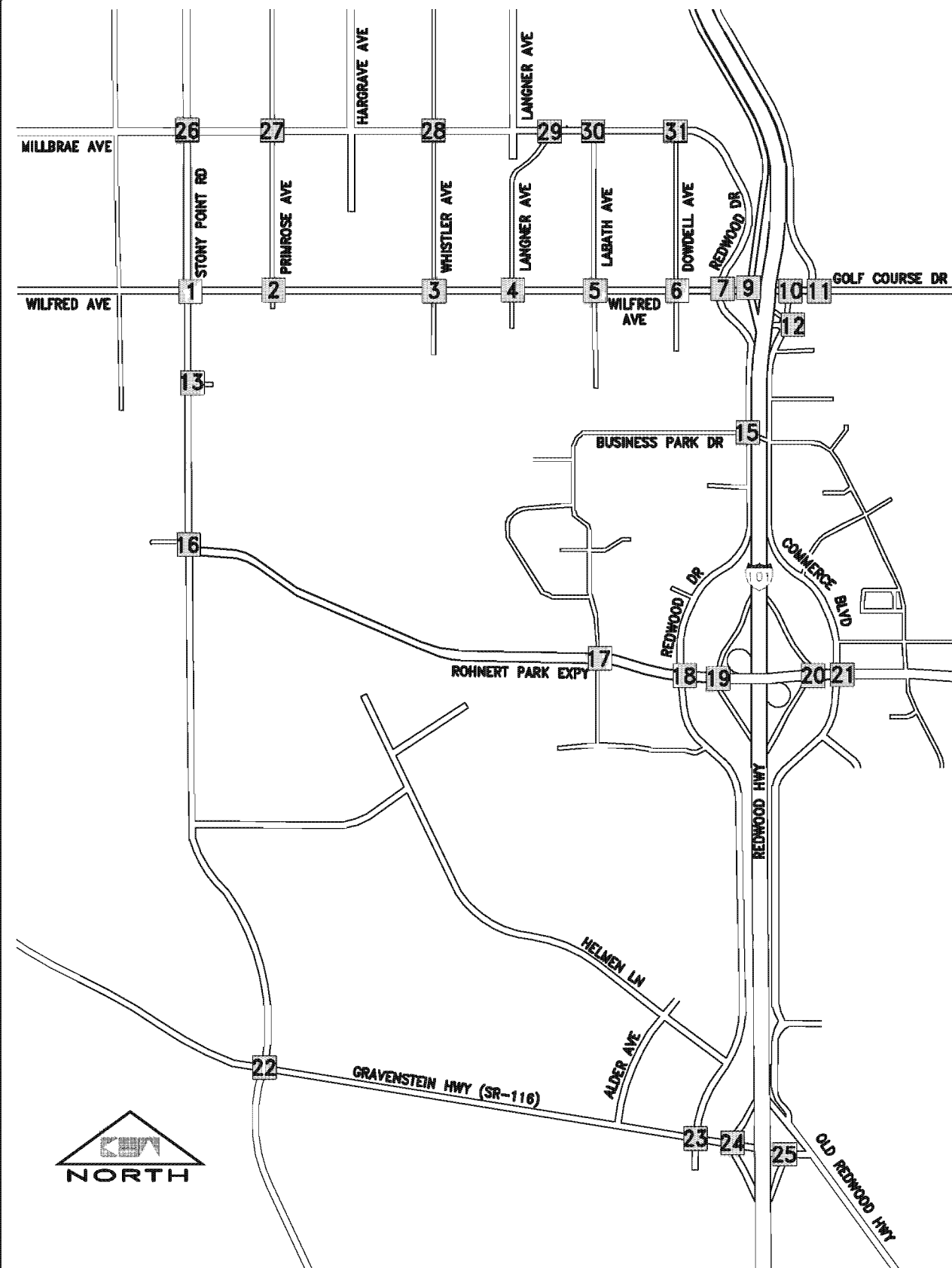


Graton Rancheria No Project – Rohnert Park, CA

NEAR-TERM PM TRAFFIC VOLUMES

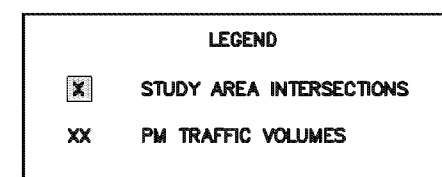
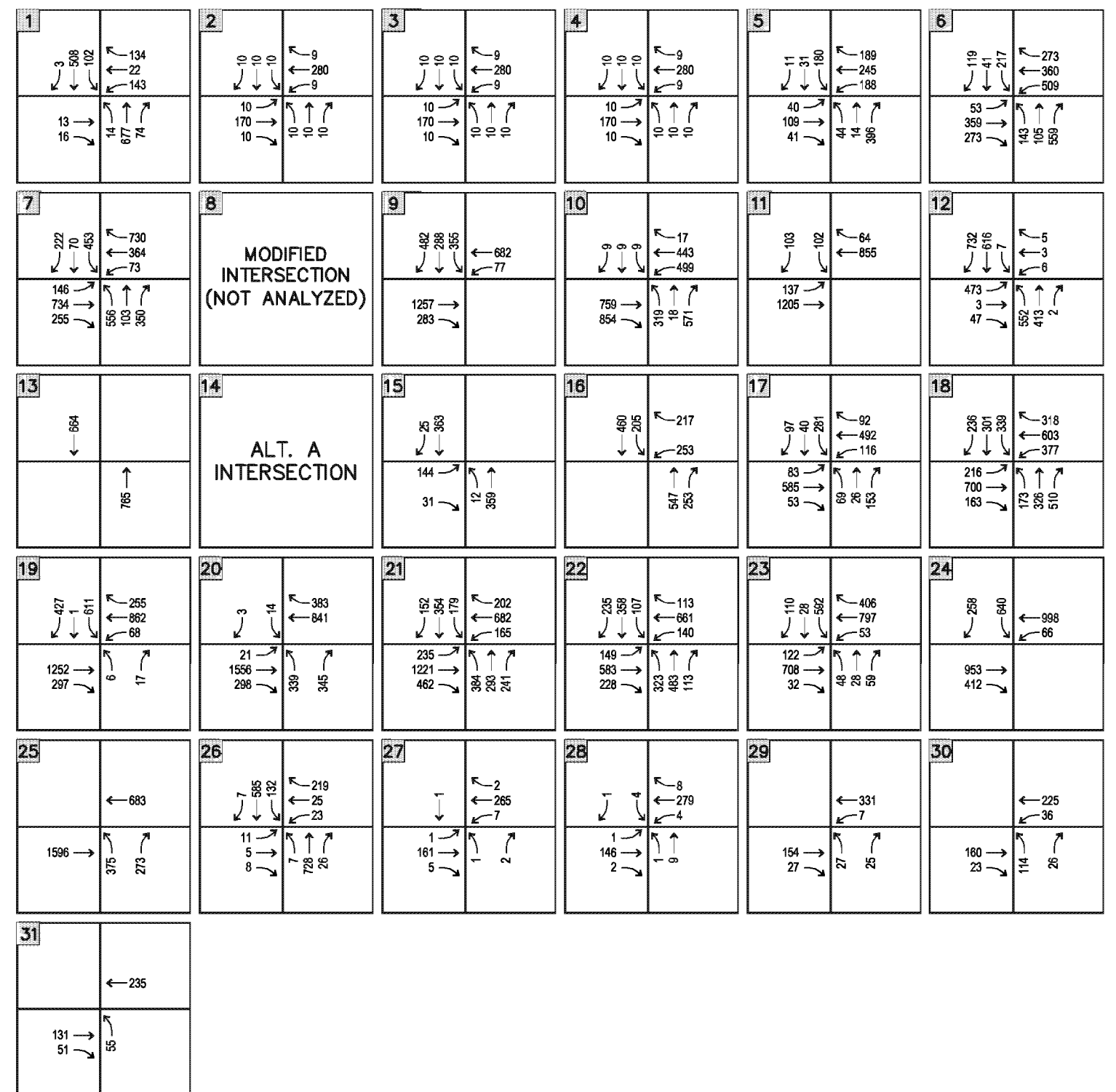
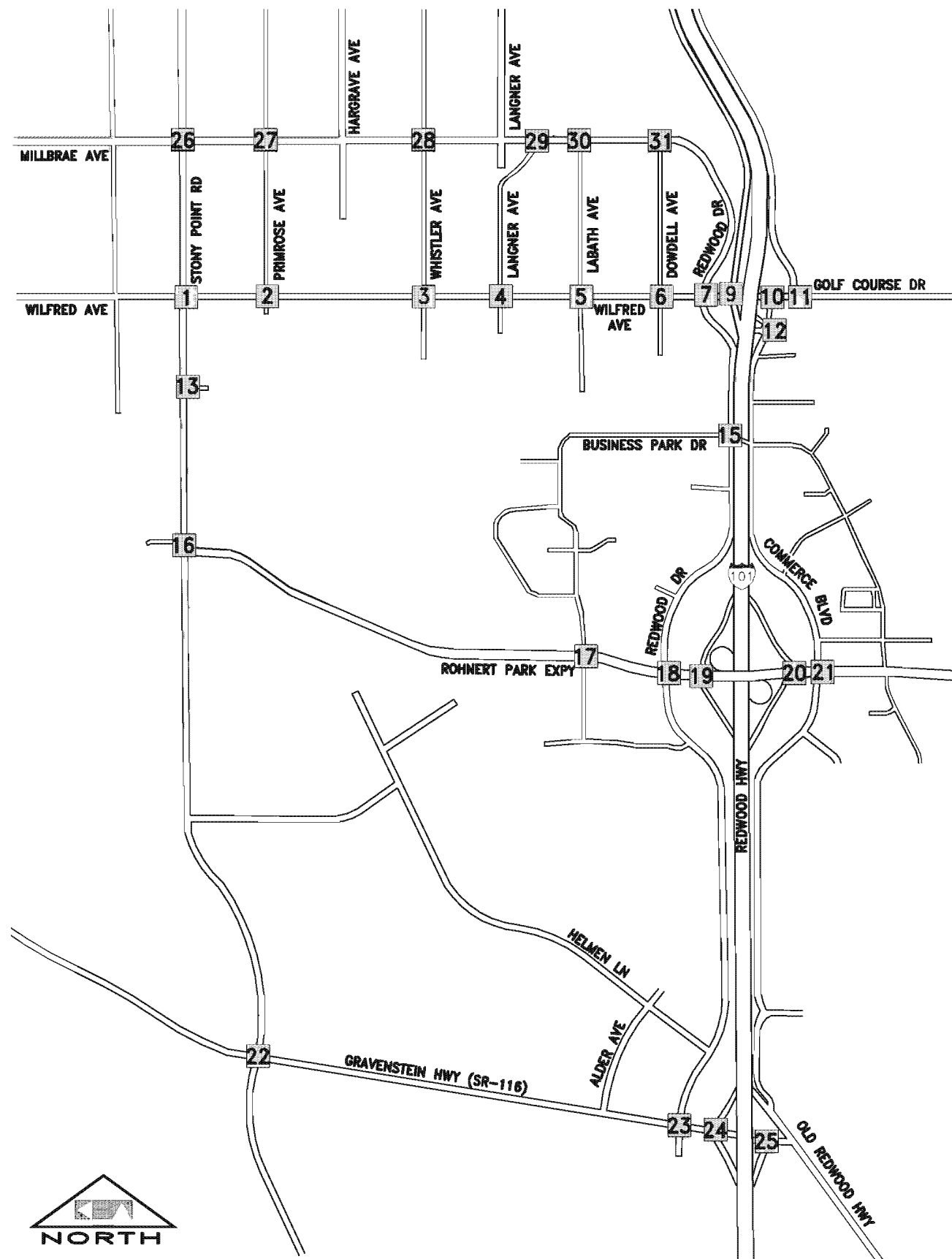
FIGURE 5





Graton Rancheria No Project – Rohnert Park, CA

FIGURE 6



Graton Rancheria No Project – Rohnert Park, CA

LONG-TERM CUMULATIVE PM TRAFFIC VOLUMES

FIGURE 7



GENERAL PROJECT INFORMATION

This section presents a description of elements of the analyses that are common to multiple study alternatives included in this study. Traffic impacts were evaluated for the following scenarios:

- 2008 analyses correspond with the proposed opening year of the casino and hotel.
- 2020 analyses represents cumulative traffic conditions for the area based upon available traffic forecasts from the Sonoma County travel forecast model provided by Sonoma County Regional Transportation Authority (SCTA). SCTA made refinements in Rohnert Park to the roadways and TAZs from the most recent information from the Sonoma County General Plan, the Rohnert Park General Plan, and the adopted specific plan assumptions.

The Memorandum of Understanding (MOU) promised funds to the City of Rohnert Park to mitigate potential impacts on transportation and traffic which includes monies to install an on-demand activated traffic signal at the entrance to the Rancho Verde Mobile Home Park on Rohnert Park Expressway.

Project Trip Generation

Trip generation for Native American gaming facilities generally peaks on Saturday evenings; however, background traffic on adjacent streets is lower than during peak weekday periods, making the overall number of vehicles on the road lower as well. In addition, casino facilities are open 24/7 and typically do not generate extreme peaks like other uses. Instead, casino/hotel traffic follows a smoother curve that builds steadily from early morning until about 7:00 PM, after which traffic levels slowly decline. Based on existing traffic volume information and expected trip generation from the casino and hotel, it was determined that the weekday PM peak period represents the worst case period to evaluate.

Trip generation for development projects is typically based on rates contained in the Institute of Transportation Engineer's publication *Trip Generation, 7th Edition*. This manual is a standard reference used by jurisdictions throughout the country and is based on actual trip generation studies at numerous locations in areas of various populations. However, *Trip Generation* does not have a land use for casinos similar to the type proposed by Graton Rancheria.

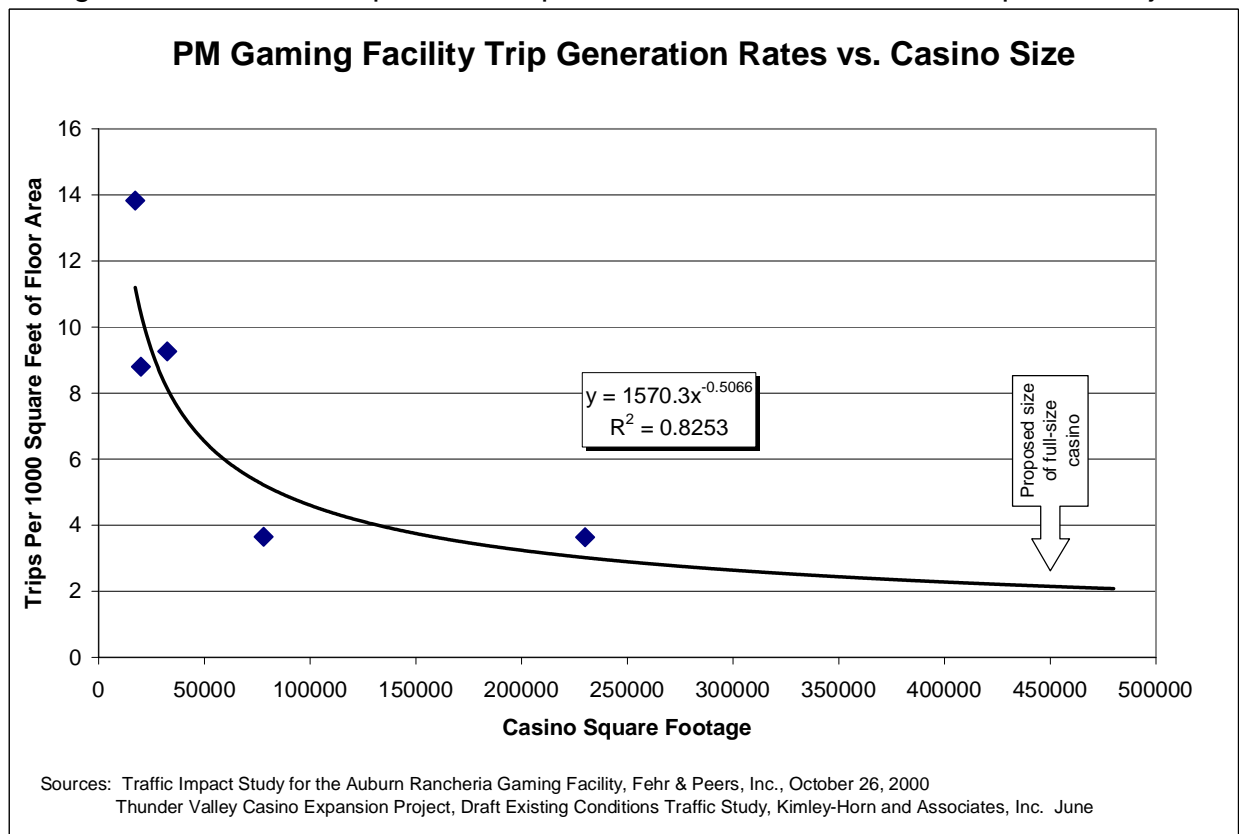
Research has been performed for hotel/casinos such as commonly found in Las Vegas and Reno, but the information is generally not applicable to this project. As a result this project relied on trip generation information obtained from other Native American casino and hotel facilities.

As part of a traffic impact study prepared for the Auburn Rancheria Gaming Facility (A.K.A. Thunder Valley Casino), trip generation was collected at four northern California gaming facilities. Data was reported for the weekday PM peak hour (i.e. the highest one-hour period between 4:00 and 6:00 PM) which is the time in which the greatest amount of combined traffic congestion commonly occurs.

Trip information from the four facilities showed that the smaller gaming facilities had higher trip rates than larger facilities, similar to the trip generation characteristics of shopping centers where small centers generate trips at a somewhat higher rate than larger centers.

Auburn Rancheria traffic study data was supplemented by more recent information collected at the completed Thunder Valley Casino by Kimley-Horn. Based on 2005 traffic data, the facility has a PM peak hour trip generation rate of 3.64 trips per 1,000 square feet of floor area. This rate occurs during the 5:00-6:00 PM period of the weekday and reinforces the principle that trip rates are lower at larger facilities.

Information from the Auburn Rancheria Traffic study and the more recent Thunder Valley Casino data was plotted and clearly shows that the highest trip generation rates based on square footage correspond to the smallest facility and the lowest rate occurs at the largest facility. The data also indicates that trip rates based on building square footages are not linear. A regression analysis showed a R^2 of 0.83 which indicates a strong fit to the data. In Update on Impacts of Tribal Economic Development Projects in



San Diego County (April 2003), San Diego County concludes the same premise that trip rates are lower for larger gaming facilities because they include "several accessory uses to encourage customers to stay longer."

The development alternatives in this study are much larger than the facilities documented in the Auburn report and consequently, the Graton Casino and Hotel project is expected to have a lower rate trip rate. The Graton Casino is proposed to include 315,100 - 450,000 square feet for the casino and related functions, plus up to a 300 room hotel. Extrapolation of the fitted curve suggests that the PM trip rate for the much larger casino would be approximately two trips per 1000 square feet. Although the data suggest a PM peak trip rate of 2/1000 s.f. is reasonable, it was determined that a higher and more conservative rate should be considered.

Therefore, the Shingle Springs casino environmental impact report/environmental assessment was also reviewed. The Shingle Springs casino is proposed to include approximately 238,500 square feet and was determined to have the following trip rates.

- Weekday AM Peak Hour: 2.95 trips/1,000 square feet
- Weekday PM Peak Hour: 4.95 trips/1,000 square feet
- Weekday (Daily trips): 39.43 trips/1,000 square feet

Based on the information from the Shingle Springs reports and in comparison with the plotted Auburn Rancheria /Thunder Valley Casino data, it was determined that the trip rate used for Shingle Springs is a reasonable but more conservative assumption for this traffic study to eliminate the possibility of underestimating project trips. Therefore, trip generation also considered the Shingle Springs DEIR/EA which evaluated additional sources of trip generation including San Diego County which, for example, recommends calculation of daily casino trips at 100 trips per 1,000 square feet of gaming area. San Diego rates are based on empirical data from several casinos in southern California and if applied to the Graton project's gaming area, the daily trip generation would be approximately 11,860 trips which is thousands below the number assumed in the Shingle Springs DEIR/EA. Therefore, trip rates used in this analysis are the same as for Shingle Springs and which are listed above. Actual trip rates for the Graton casino are likely to be lower. The Graton PM rate represents a 36% increase over the Thunder Valley data and a 148% increase over data from the combined 5 northern California gaming facilities. Using a trip generation rate that is higher ensures a conservative approach to identifying project impacts and associated mitigations.

As noted earlier, trip generation was prepared in consideration of actual data from five northern California gaming facilities. The largest of the facilities was Thunder Valley Casino located along Highway 65 and which is less than 7 miles from I-80. Thunder Valley is considered by many gaming operators to be the most successful casino in California. It offers slot machines, table games, a wide variety of restaurants, bars, and

professional entertainment similar to the proposed Graton Casino. Thunder Valley's location is within roughly 30 miles of 1.9 million people residing in 5 Sacramento area counties (2000 census). At a similar distance from the proposed Graton casino located near Santa Rosa there are four counties with a combined population of approximately 1.0 million (2000 census). Based on this information, comparisons between Thunder Valley and Graton casino are considered reasonable and valid.

Trip generation for the 300 room hotel was based on data contained in ITE *Trip Generation* but adjusted with the assumption that most guests at the hotel would also be guests of the casino. The casino is expected to implement a pricing structure for the rooms that favors casino guests. Therefore, the ITE hotel rate was reduced by 2/3 to account for internal capture to and from the casino. Reducing the rate is based on professional judgment and is consistent with the Shingle Springs report which researched this issue and ultimately assumed a 3/4 reduction for hotel rooms.

Sometimes developments also attract trips that are already on the road that stop as they pass by the site. These are not new vehicle trips but are considered to be pass-by trips. Although some trips to the site will be pass-by trips, no empirical data was readily available to determine a reasonable pass-by rate. Therefore, pass-by trips are conservatively not assumed in the analysis.

Furthermore, development projects also attract diverted link trips. These are also trips that are already on the road but change their route to access to the site. These trips originate from adjacent freeways, highways, or city streets. Although some trips to the casino site will be diverted link trips, no empirical data was readily available to determine a reasonable rate. Therefore, diverted link trips are conservatively not assumed in the analysis.

Although pass-by and diverted link reductions are not assumed in the analysis, it is reasonable to assume that 15 percent or more of the project trips are from these two trip types. Therefore, trips associated with the proposed casino (at 4.95/1000 s.f.) are conservatively overestimated by approximately 15 percent (due to pass-by and diverted link trips) already on the freeway and intersections away from the general vicinity of the project site.

It is recognized that some incidental trips may occur in relation to the casino such as wine tasting tours, costal activities, and other off-site attractions; however, because of the conservative nature of the casino trip generation rate assumptions, these incidental trips are accounted for in the PM trip generation calculations.

Project Trip Distribution and Assignment

In preparation of the traffic distribution, Kimley-Horn reviewed the project's use in proximity to the surrounding population centers. Because of the nature of the project,

customers and employees are expected to travel from nearby locations and beyond. Much of the trips are expected to travel to/from US-101. The location of the San Francisco Bay Area population in relation to the project site, as well as peak hour turning movement volumes at the study intersections, the likely customer and employee base for the site, major connections to highways, and potential access limitations, were evaluated in order to estimate the likely distribution of project traffic.

Trip generation and distribution for the casino/hotel includes a mixture of passenger cars, trucks, and RVs and was evaluated based on the assumption that two percent of the vehicles on roads accessing the site would be trucks or RVs.

Potential Conflicts with Special Event Traffic

The project sites are located more than 4 miles driving distance from the Spreckels Performing Arts Center and Sonoma State University (SSU) which is the home of the future Green Music Center as well as the Evert B. Person Theatre.

Spreckels Performing Arts Center houses two theatres – the Nellie W. Coddington Theatre which seats 550 patrons and the Bette Condiotti Experimental Theatre which seats up to 125 patrons. Most events occur on Saturday or Sunday with start times between 7:30 and 8:00 PM. Some weekday events also occur but they are frequently held in the middle of the day.

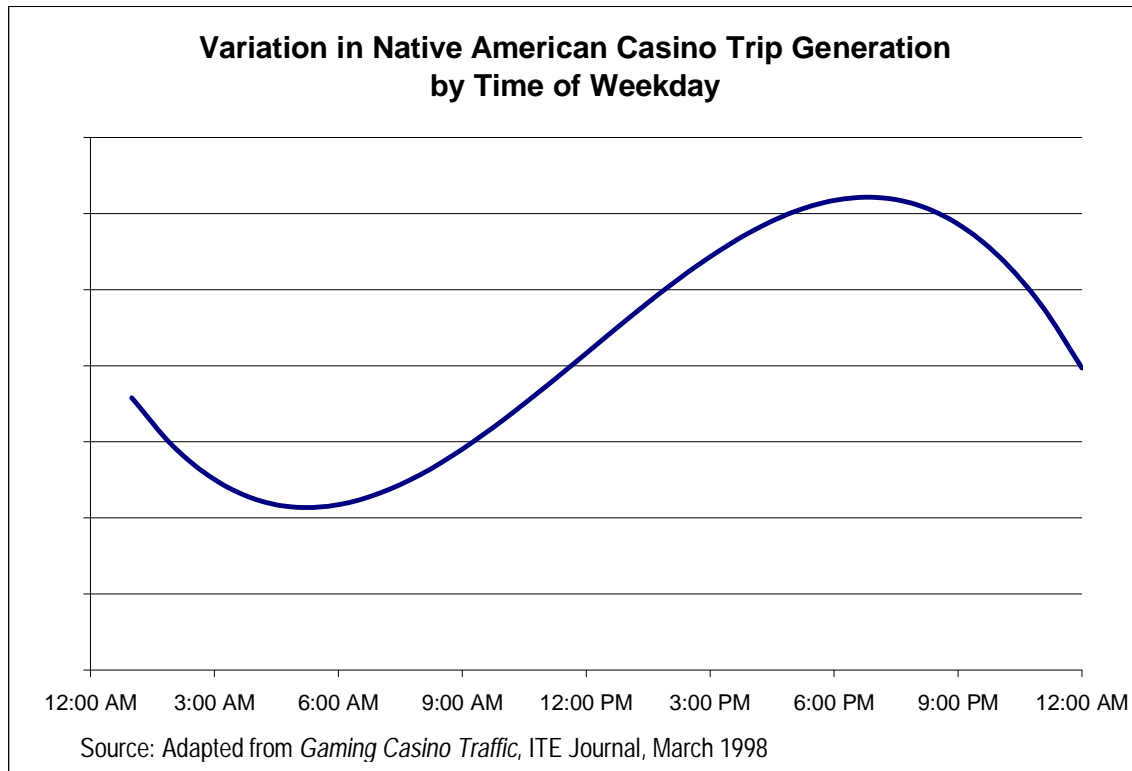
SSU houses many performance spaces – the Warren Auditorium seating up to 182 patrons, Ives 119 seating up to 200 patrons, PE 1 Studio Theatre seating up to 150 patrons, Ives 76 Studio Theatre seating 50 patrons, the Evert B Person Theatre seating up to 475 patrons. The future Green Music Center which is scheduled to open in spring of 2008 will include an inside concert hall seating up to 1,400 patrons with an outside venue for events up to 10,000 patrons. Events are scheduled on weekdays and weekends with start times between 7:30 and 8:00 PM. Occasionally, some weekday events are also scheduled in the middle of the day.

According to the Executive Director of the Green Music Center at SSU, the events with the greatest attendance are most likely to occur during the summer months between June and September and will attract between 3,000-10,000 people per event. Events of this magnitude are expected to occur about once per week (primarily on Saturdays). Other smaller events, with attendance up to 1,000 people, include concerts and other performances, and occur roughly ten times per month throughout the year. Concert times have not been determined but it is assumed that they will be similar to other SSU events.

Due to the proximity of the performing arts centers and concert start times, conflicts between casino/hotel traffic and the performing arts centers will be limited. The centers are located on the east side of the freeway and traffic generally travels through different intersections. However, on days when events are held at the performing arts centers,

surges of traffic commonly occur, with a sharp peak immediately following the conclusion of the event.

As noted earlier, casino traffic follows a different arrival and departure pattern, with weekday traffic following a smoother curve that builds steadily from early morning until about 7:00 PM, after which traffic levels slowly decline. On weekends, the peak is generally delayed until around 9:00 PM or later.



Although peak traffic generated by the hotel and casino would not regularly coincide with peak traffic generated by the performing arts centers, there will be times when traffic events overlap and when the size of the events conflict. During summer months when large outdoor events are held, combined traffic congestion will potentially have an adverse effect on traffic operations. This conflict will most likely occur at the Rohnert Park Expressway interchange. Although the frequency of the occurrences is expected to be low, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur, the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control. It should be noted that with the Northwest Stony Point Reduced Intensity Alternative and the Wilfred Avenue Reduced Intensity Alternative there will be less traffic conflicting with special event traffic.

Potential Effects on Transit, Bicycle, and Pedestrian Mobility

As noted earlier, Sonoma County Transit and Golden Gate Transit do not provide service near the site and have no plans to provide service. Therefore, this traffic study conservatively assumed no reduction in peak hour vehicular traffic due to travel by public transit. Transit ridership could be increased if the project operated a shuttle between the casino and Rohnert Park transit hubs. This would allow patrons to reach the site from many areas of the Bay using conventional transit routes. Shuttle service could circulate between the two destinations, thus helping reduce traffic generated by the project. The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

Although Sonoma County Transit and Golden Gate Transit have previously indicated that they do not plan to provide bus service to the casino sites, the project will include transit facilities/amenities at transit access points, for public and private transit operations. Flexible work schedules and subsidized shuttle service could also be provided; however, subsidized transit passes and validation of transit tickets will not be useful to employees or customers unless Sonoma County Transit and Golden Gate Transit choose to provide service to the casino.

According to the 2000 U.S. Census, 4.7% of Rohnert Park residents use transit to travel to work. This typically represents the highest level of transit ridership during the day. If it is conservatively assumed that 4.7% of employees or customers will use transit (assuming a shuttle connection is provided by the casino) during the peak hours of the day, it represents approximately 107 in the weekday PM peak periods.

Data was not readily available for peak hour ridership levels on the Sonoma County Transit or Golden Gate Transit systems but during the weekday periods, the routes operate every 30 minutes and observations indicate the sufficient capacity exists on the buses to accommodate the potential additional transit demand. Furthermore, dispersion of the project-generated riders to the bus routes would result in a minimal effect on transit capacity. Thus the project impact on transit service is determined to be less than significant.

The effect of the casino/hotel on the proposed Sonoma-Marin Area Rail Transit (SMART) was also evaluated. It was determined that because the SMART system will only operate during the AM and PM commute hours, there is little opportunity for casino employees or patrons to use service. Therefore the project impact on SMART service is determined to be less than significant.

Park and ride facilities at the Rohnert Park Expressway interchange are not expected to be affected development of either a casino or business park.

Due to the low volume of pedestrians and bicyclists in the vicinity of the sites, the lack of continuous sidewalks and bikeways, and the nature of the casino/hotel project, it is unlikely that significant numbers of project patrons will walk or bike to the site. Furthermore, the project is not expected to have a notable effect on current mobility for bicyclists and pedestrians.

Construction Traffic Impacts

The day-to-day construction operations for the proposed construction of the Graton Rancheria Casino and Hotel will include traffic impacts related to construction employees, fill, and construction material importation. The principal activities expected to generate traffic related to the construction are listed below:

- Employee trips are based on the number of employees estimated to be on site during different points throughout the project. Each employee is assumed to drive to and from the site alone each day and it is assumed that 20% of the workers leave and return to the site for various purposes during the day.
- Construction import is based on the number of trucks required to deliver construction materials to the site, including building materials such as wood, steel, and masonry as well as fill from a nearby borrow pit.
- Heavy equipment is based on the number of large construction vehicles expected during the project duration. The heavy equipment expected as part of this project was provided by Station Casinos.

Using the expected traffic information above, construction related traffic generation was estimated. Each construction activity listed above will generate different volumes of traffic at different points in the project. For example, the delivery and removal of heavy equipment to the project site will happen only a few times during the project duration. The construction related traffic is expected to remain relatively consistent throughout the project.

It is estimated that it will take between 20 and 27 months to complete construction of the project including 4 to 5 months for the grading of the site for Alternatives A through E and Alternative H. Alternatives A, B, and C are estimated to take 27 months to complete construction. Alternatives D and H are estimated to take 24 months to complete construction and Alternative E is estimated to take 20 months to complete construction.

Construction Material Import – It is estimated that 300,000 cubic yards of earthwork will be required to develop the site for Alternative A. It is expected that construction of the proposed project will involve 25,000 cubic yards of earthwork from an on-site location

adjacent to the development area which would not generate any traffic on the surrounding roadways.

275,000 cubic yards of fill will be taken from an on-site location separated from the development area which would generate traffic on the surrounding roadways. The on-site separated location is the southern portion of the Wilfred site where truck traffic will travel on a 5 mile loop from Rohnert Park Expressway to Stony Point Road to Wilfred Avenue to Redwood and back to Rohnert Park Expressway. Trucks will leave/enter the on-site fill location at the Rohnert Park Expressway driveway just east of the Bellevue-Wilfred Channel. The trucks will leave/enter the development area at the Wilfred/Labath intersection. Based on a carrying capacity of 12 cubic yards per truck, it is estimated that it would take approximately 22,917 trucks to complete this task. Doubling to account for the inbound and outbound component of each round trip, this would result in approximately 45,834 trip ends. Assuming that these were spread out over a period of 5 months, with trucks operating at 6 days per week, 10 hours per day, this would result in 191 trucks making 382 trip ends on an average day with 19 trucks making 38 trip ends in any given hour (including potentially the peak hour) on the 5 mile loop.

It is estimated that 150,000 cubic yards of earthwork will be required to develop the site for Alternative B, Alternative D and Alternative E. It is expected that construction will involve 150,000 cubic yards of fill that will be taken from an on-site location separated from the development area which would generate traffic on the surrounding roadways. The on-site separated location is the southern portion of the Stony Point site where truck traffic will travel on a 5 mile loop from Rohnert Park Expressway to Stony Point Road to Wilfred Avenue to Redwood and back to Rohnert Park Expressway. Trucks will leave/enter the on-site fill location at the Rohnert Park Expressway driveway just east of the Bellevue-Wilfred Channel. The trucks will leave/enter the development area at the Stony Point Road/Project Driveway intersection. Assuming that the trips were spread out over a period of 4 months, with trucks operating at 6 days per week, 10 hours per day, this would result in 131 trucks making 262 trip ends on an average day with 13 trucks making 26 trip ends in any given hour (including potentially the peak hour) on the 5 mile loop.

It is estimated that 350,000 cubic yards of earthwork will be required to develop the site for Alternative C. It is expected that construction will involve 350,000 cubic yards of fill that will be taken from an on-site location separated from the development area which would generate traffic on the surrounding roadways. The on-site separated location is the southern portion of the Wilfred site where truck traffic will travel on a 5 mile loop from Rohnert Park Expressway to Stony Point Road to Wilfred Avenue to Redwood and back to Rohnert Park Expressway. Trucks will leave/enter the on-site fill location at the Rohnert Park Expressway driveway just east of the Bellevue-Wilfred Channel. The trucks will leave/enter the development area at the Wilfred/Whistler intersection. Assuming that the trips were spread out over a period of 5 months, with trucks operating at 6 days per week, 10 hours per day, this would result in 243 trucks making 486 trip

ends on an average day with 25 trucks making 50 trip ends in any given hour (including potentially the peak hour) on the 5 mile loop.

It is estimated that 270,000 cubic yards of earthwork will be required to develop the site for Alternative H. It is expected that construction will involve 25,000 cubic yards of earthwork from an on-site location adjacent to development area which would not generate any traffic on the surrounding roadways.

245,000 cubic yards of fill will be taken from an on-site location separated from the development area which would generate traffic on the surrounding roadways. The on-site separated location is the southern portion of the Wilfred site where truck traffic will travel on a 5 mile loop from Rohnert Park Expressway to Stony Point Road to Wilfred Avenue to Redwood and back to Rohnert Park Expressway. Trucks will leave/enter the on-site fill location at the Rohnert Park Expressway driveway just east of the Bellevue-Wilfred Channel. The trucks will leave/enter the development area at the Wilfred/Labath intersection. Assuming that these were spread out over a period of 5 months, with trucks operating at 6 days per week, 10 hours per day, this would result in 171 trucks making 342 trip ends on an average day with 17 trucks making 34 trip ends in any given hour (including potentially the peak hour) on the 5 mile loop.

Once the site is graded, the project will also require the importation of construction material including, raw materials, the building pad, concrete, the parking lot base and asphalt paving. This results in a material importation of 3,000 to 4,000 truckloads of material which will occur over approximately 23 months (or less, depending on the alternative). The importation will require approximately 8 to 9 truck trips per day outside of the off-site fill delivery. Each truck will generate 1 inbound and 1 outbound trip, accounting for 2 trips. Therefore, during the peak construction period the project will generate about 18 truck trips ends per day.

Because the import truck traffic generates significantly less traffic than the project's equivalent passenger car traffic generation (even when added to employee trips described below) and the vehicle path travels through generally uncongested intersection movements, it should not significantly impact the capacity of any study intersection. However, this level of truck traffic may have an impact on quality of life including increased noise, visual impact, perception of lower traffic safety, and the track of debris and mud onto roadways may create a perceptual impact as well as a physical impact. See Project Mitigations section for measures to address these impacts.

Employees – The weekday work will begin around 7:00 a.m. and end around 4:00 p.m. The construction worker arrival peak occurs between 6:30 a.m. and 7:30 a.m., and the departure peak occurs between 4:00 p.m. and 5:00 p.m. This is generally prior to the areawide commute peaks between 7:30 a.m. and 8:30 a.m. and between 4:30 p.m. and 5:30 p.m. with a period of overlap into the commute peak periods. There will be 600 to 800 employees on-site during construction and only half will be on the roadway during the peak hours.

Workers will generate peak parking demand equivalent to roughly 800 vehicles during the peak construction period. Additionally, deliveries, visits, and other activities may generate peak non-worker parking demand of up to another 50 trucks and autos. Therefore, an approximate demand of 850 vehicle parking spaces will be required during the peak construction period for the construction employees. It is anticipated that this demand will be able to be met on site at the casino construction site. As an alternative, the project could lease a remote lot and shuttle employees to the construction site.

The impacts of construction related employee traffic and parking are considered less than significant because the construction commute peak and the areawide commute peak will only have a brief period of overlap and the parking demand will be able to be met at the casino construction site.

Heavy Equipment – A total of approximately 30 pieces of heavy equipment will be used based on wide-load permits necessary at various times over the course of the construction period. Delivery and removal of heavy equipment will occur outside of the areawide commute peak and equipment will be moved in and out of the site on different days. The periodic delivery during off-peak hours constitutes a minimum disruption of traffic.

The impacts of the periodic delivery and removal of heavy equipment during off-peak hours constitutes a minimum disruption of traffic and thus is considered less than significant.

ALTERNATIVE A – WILFRED AVENUE SITE

The Alternative A casino and hotel is proposed to be located as shown in **Figure A1**, which is bordered by Wilfred Avenue in the north, Business Park Drive in the south, Langner Avenue in the west, and Dowdell Avenue in the east.

The site layout as shown in **Figure A2** includes a main building of approximately 450,000 square feet for a casino, restaurants, food court, event center, banquet facilities, lobby, pool, and other ancillary functions. In addition, the project is planned to include up to 300 hotel rooms, primarily for casino guests.

A breakdown of square footage as it relates to traffic impacts is shown below:

- Casino and Entertainment areas – 408,150 s.f.
- Lobby/Bar/Back of House/Sundries – 14,750 s.f.
- Pool and Spa – 27,100 s.f.
450,000 s.f.
- Hotel Rooms – 291,000 s.f.

The site plan also shows supporting uses such as parking lots, parking structure, and wastewater treatment facilities.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Site Access

The main access points to the project are located on Langner Avenue and Labath Avenue via Wilfred Avenue. These approaches are assumed to operate as full movement driveways with no turn limitations. The project will extend Labath Avenue to the south to intersect Business Park Drive. A third project access will be on Labath Avenue just north of Business Park Drive and is assumed to be a full movement driveway with no turn limitations.

Currently, none of the accesses are signalized.

Trip Generation – Alternatives A, B, and C

Trip generation was calculated based on the previous discussions and is reported in **Table A1**. Additional trip generation calculations are contained in the **Appendix**. Since Alternatives A, B and C are all casinos with the same amount of gaming space and hotel space, trip generation numbers are the same for all three Alternatives. As seen in

the table Alternatives A, B and C are expected to generate 1,384 new trips in the AM and 2,287 new trips in the weekday PM peak hour. Although project trip generation was prepared for daily, AM, and PM periods, only the PM traffic conditions were evaluated in this report because it represents the time period where the project will contribute to the greatest amount of congestion and potential mitigation. Other time periods that were considered included weekday AM, weekday late PM, and Saturday. On weekday late evenings and Saturday evenings the casino facility will generate more trips than during the 4-6 PM weekdays, but the background traffic is lower, making the overall number of vehicles on the road lower as well. Therefore, the PM peak represents the worst case period to evaluate.

Table A 1 – Alternatives A, B and C Project Trip Generation

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Casino 450,000 s.f.	17,744	930	398	1,328	1,181	1,047	2,228
Hotel 300 Room*	817	34	22	56	31	28	59
Net New Vehicle Trips	18,261	964	420	1,384	1,212	1,075	2,287

*Trip rate is ITE Land Use Code 310 – Hotel. Rate reduced by 2/3 to account for internal capture to/from casino.

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to destinations north of the site, with the remaining 70% distributed south of the site. To be conservative, only a small percentage of project traffic was assumed to be generated or attracted in the immediate vicinity of the project site. The project traffic distribution is shown in **Figure A3** and **Figure A4**. **Figure A5** illustrates project traffic assigned to the study intersections based on the assumed trip distribution. As seen in **Figure A5**, most of the project traffic is expected to come from the freeway therefore it was assumed that most of the traffic would use Labath Avenue because of its closer proximity to the freeway. As noted in the distribution, some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the Alternative A casino and hotel project. **Figure A6** illustrates the combined near-term turning movement volumes at the study intersections.

Long-Term Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the Alternative A casino and hotel project. **Figure A7** illustrates the combined long-term turning movement volumes at the study intersections.

Alternative A LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions:

- Near-term conditions with Alternative A (year 2008)
- Long-term Cumulative conditions with Alternative A (year 2020)

In the near-term analysis for Alternative A, it was assumed that the Wilfred Avenue widening project will not have taken place before the casino/hotel opens. The Memorandum of Understanding (MOU) between the City of Rohnert Park and the Federated Indians of the Graton Rancheria stated that the tribe would help financially to speed up the timeline of the widening project to occur before the casino/hotel opens in 2008. The MOU was negotiated before Alternative A existed, but it was assumed that the MOU will be renegotiated to apply to Alternative A as well.

Results of the analysis are presented in **Table A2**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

2008 Results

- Stony Point Road/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Labath Avenue
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

Table A 2 – Alternative A Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	F	841.3	F	OVRFL
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	13.8	B	12.5	C	16.2
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	13.8	B	12.5	C	15.8
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	F	51.3	B	12.5	F	111.1
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	148.7	F	169.9	F	182.3
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	22.5	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	27.7	C	26.8	D	45.7
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	E	69.4	E	74.2	F	96.2
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	14.6	B	19.0	B	19.7
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	64.8	D	50.8	E	66.2
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	-	-	-	-	-	B	10.6	-	-	B	10.3
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	C	16.7	C	22.2
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	B	19.8	B	18.5	C	21.7
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	D	43.3	C	28.2	D	40.6
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	26.0	C	29.1	C	26.4
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.2	B	16.0	B	16.0
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	18.5	B	12.3	B	17.4
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	38.9	E	63.4	C	33.0
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	37.6	D	45.5	F	118.2
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	28.0	C	28.0	D	42.4	E	56.3
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	17.4	B	18.1	B	19.6
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.4	B	11.5	B	11.4
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	72.0	F	90.2	F	156.3
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.6	B	12.4	B	12.2
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.7	B	12.5	B	12.4
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	B	11.0	B	11.3	B	11.4
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	12.0	B	14.7	B	13.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.7	B	11.4

2020 Results

- Stony Point Road/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Labath Avenue
- Gravenstein Highway (SR-116)/Stony Point Road
- Gravenstein Highway (SR-116)/Redwood Drive
- Millbrae Avenue/Stony Point Road

Alternative A Traffic Signal Warrant Analysis

Alternative A, near-term and long-term, traffic volumes at unsignalized study intersections were compared against peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersections will satisfy traffic signal Warrant #3 by year 2008 and 2020.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Langner Avenue/Wilfred Avenue (2020)
- Labath Avenue/Wilfred Avenue (2008 and 2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Alternative A LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed casino and hotel were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the casino and hotel project. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table A3**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project.

Table A 3 – Alternative A Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt A		2020		2020 + Alt A	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	D	26.9	C	25.6	E	38.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	E	35.2	D	34.1	F	41.8
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	E	36.5	E	36.1	F	43.1
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	31.7	D	32.3	F	-
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	33.9	E	37.1	F	42.1
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	24.5	C	23.2	C	25.9
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	31.2	D	29.0	E	39.1
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	31.2	D	29.0	E	39.1
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	31.2	D	29.0	E	39.1
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.6	E	40.4	E	41.0
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.6	E	40.4	E	41.0
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.6	E	40.4	E	41.0
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.8	D	29.7	D	32.6
Southbound											
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	26.1	D	28.5	D	31.2
Santa Rosa Avenue SB On-Ramp	E	D	31.2								
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	36.2	F	-	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.8	F	44.8	F	46.8
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	39.4	E	39.9	F	48.8
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	39.4	E	39.9	F	48.8
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	39.4	E	39.9	F	48.8
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	35.4	E	38.5	F	41.3
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	36.1	F	37.5	F	43.0
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	29.8	E	36.6	F	-
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	E	36.1	F	40.3	F	47.2
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	38.3	F	42.3	F	48.5
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	29.0	D	32.0	F	-

Potential Effects on Intersection Safety

Traffic volumes generated by the project were reviewed in consideration of existing intersection collision history and the potential for increased accidents. According to collision data, accidents involving bicyclist and pedestrians are very low. Many intersections did not report any collisions of this type during the survey period. This suggests that bicycle and pedestrian volumes are relatively low and study intersections have minimal safety hazards for individuals biking or walking. Although the project will introduce increased traffic volumes at some intersections, bicyclists and pedestrians are expected to be able to travel through study intersections with similar levels of safety. Historically casinos do not attract a significant amount of bicycle and pedestrian traffic. Therefore, the expected amount of pedestrian and bicycle traffic is nominal and a significant increase in bicycle and pedestrian accidents is unlikely.

The potential for increased collisions between motorized vehicles was also considered. Collision frequency and severity are a function of many complex factors that vary depending on the location and type of intersection or roadway segment. Factors include traffic control such as signals or stop signs, lane and shoulder widths, grades, driveway densities, roadside hazards or obstacles, presence of left and right turn lanes, sight distance, congestion, and others.

Because of the number and interrelationships of the variables, accurate crash prediction is difficult. However, the proposed casino and hotel project will increase roadway congestion, a factor which could result in an increase in traffic collisions if left unmitigated. Other factors are expected to remain unaffected.

As noted previously, the purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development. This includes mitigation improvements to restore traffic operations to levels within acceptable standards or to levels as good as or better than without the casino/hotel project. Any potential increases in accidents due to project-related traffic would be offset by the implementation of roadway improvements included as mitigation. Therefore, if mitigations are implemented as proposed in this report, no significant increase in daytime or nighttime collisions is expected.

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table A4**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.



Table A 4 – Alternative A Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020
1 Stony Point Road and Wilfred Avenue	EBL			
	EBR			
	WBL			
	WBR	35	OVRFL	OVRFL
	NBL	150	25	25
	NBR			
4 Langner Avenue and Wilfred Avenue	SBL	150	26	35
	SBR			
	EBL			
	EBR			
	WBL	150		25
	WBR			
5 Labath Avenue and Wilfred Avenue	NBL			
	NBR			
	SBL			
	SBR			
	EBL	150		25
	EBR			
6 Dowdell Avenue and Wilfred Avenue	WBL	150		80
	WBR			
	NBL			
	NBR			
	SBL			
	SBR			
7 Redwood Drive and Wilfred Avenue	EBL	150		111
	EBR	150		168
	WBL			
	WBR			
	NBL	150	317	352
	NBR	100	97	110
8 Redwood Drive and Commerce Boulevard	SBL	275	314	474
	SBR			
	EBL	75	25	
	EBR	75	49	
	WBL	100	25	
	WBR			
9 Wilfred Avenue and SB US 101 Ramps	NBL	150	131	
	NBR	150	25	
	SBL	200	40	
	SBR			
	EBL			
	EBR			
10 Golf Course Drive and Commerce Blvd	WBL	200	30	25
	WBR			
	NBL			
	NBR			
	SBL	550	261	405
	SBR			
11 Roberts Lake Drive and Golf Course Drive	EBL			
	EBR			
	WBL	180	191	99
	WBR			
	NBL	75	284	116
	NBR			
12 Commerce Blvd and NB US 101 Ramps	SBL	250	45	25
	SBR			
	EBL	100	107	68
	EBR			
	WBL			
	WBR			
15 Business Park Drive and Redwood Drive	NBL	200	478	531
	NBR			
	SBL	100	25	25
	SBR	175	236	203
	EBL	225	97	75
	EBR			
16 Stony Point Road and Rohnert Park Expy	WBL			
	WBR			
	NBL			
	NBR			
	SBL			
	SBR			
17 Labath Avenue and Rohnert Park Expy	EBL	160	61	67
	EBR	200	25	26
	WBL	250	62	41
	WBR	170	25	25
	NBL	130	36	38
	NBR	130	36	33
18 Redwood Drive and Rohnert Park Expy	SBL	100	573	547
	SBR			
	EBL	200	109	98
	EBR	200	25	25
	WBL	350	154	204
	WBR	155	36	41
19 SB US 101 Ramps and Rohnert Park Expy	NBL	250	157	136
	NBR	250	65	64
	SBL	175	188	237
	SBR	175	58	56
	EBL			
	EBR			
20 NB US 101 Ramps and Rohnert Park Expy	WBL	225	56	63
	WBR			
	NBL			
	NBR			
	SBL	400	318	311
	SBR	400	228	203
21 Commerce Blvd and Rohnert Park Expy	EBL	190	25	25
	EBR			
	WBL			
	WBR			
	NBL	225	473	495
	NBR			
22 Stony Point Road and Gravenstein Hwy	SBL			
	SBR			
	EBL	250	69	69
	EBR			
	WBL	200	187	264
	WBR			
23 Redwood Road and Gravenstein Hwy	NBL	250	210	245
	NBR	175	56	75
	SBL	150	98	147
	SBR	150	51	50
	EBL	350	162	183
	EBR			
24 Gravenstein Hwy and SB US 101 Ramps	WBL	500	155	138
	WBR	150	43	42
	NBL	550	296	290
	NBR	675	30	29
	SBL	500	169	344
	SBR	625	49	51
25 Gravenstein Hwy and NB US 101 Ramps	EBL	225	161	171
	EBR			
	WBL	150	63	79
	WBR	80	25	32
	NBL	50	65	65
	NBR			
26 Stony Point Road and Millbrae Avenue	SBL	225	388	513
	SBR			
	EBL	50	101	102
	EBR	100	104	124
	WBL			
	WBR			
	NBL			
	NBR			
	SBL	425	222	216
	SBR			
	EBL			
	EBR			
	WBL			
	WBR			
	NBL	395	144	150
	NBR	275	178	191
	SBL			
	SBR			
	EBL			
	EBR			
	WBL			
	WBR	120	48	132
	NBL	505	25	25
	NBR	120	25	25
	SBL	490	25	25
	SBR			

Alternative A Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Alternative A traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown on **Table A5** are needed in the near-term (2008) and long-term (2020) to mitigate project impacts.

Table A6 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections.

Figures A8 and 9 illustrate the mitigated lane geometry and traffic control.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue.

The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to Langner Avenue at the edge of the project site. From Langner Avenue west to Stony Point Road, Wilfred Avenue should be two lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and should include Class II bike lanes out to Stony Point Road to connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Langner Avenue, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Langner Avenue and Labath Avenue should be improved and either removed from County jurisdiction or designed to the County standard.

An overcrossing should be built from State Farm Drive to Business Park Drive over US-101 with a southbound slip ramp lane that would open up just south of the US-101 NB off-ramp directly to the overcrossing. The overcrossing helps redirect project traffic away from the Wilfred interchange to a new facility capable of accommodating casino traffic. Additional right-of-way is necessary on State Farm Drive as well as Business Park Drive. Access to State Farm Drive will need to be modified and adjusted, but it is not anticipated that there will need to be any closures associated with the overcrossing. The overcrossing should begin east of the State Farm Drive/Commerce Boulevard intersection and touch down west of the Business Park Drive/Redwood Drive intersection. With this mitigation, all of the existing turning movements at the



Commerce/State Farm and the Redwood/Business Park intersections will be permitted as they currently exist.

In addition to the overcrossing in the long-term, modification of the Commerce Boulevard/US-101 NB Ramps intersection should be completed which would realign Wilfred Avenue, Commerce Boulevard, Golf Course Drive, and US-101 NB Ramps and combine with the Golf Course Dr/Commerce Blvd intersection. The southbound approach from Wilfred Avenue will be two left turn lanes, one through lane, and a free right turn lane. The northbound approach from Commerce Boulevard will be two left turn lanes, two through lanes, and a right turn lane. The eastbound approach from the US-101 NB off-ramp will be two left turn lanes, one through lane, and one right turn lane. The westbound approach from Golf Course Drive will be a left turn lane, a through lane, and a right turn lane.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

Table A 5 – Alternative A Summary of Mitigations

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	1	Stony Point Rd/ Wilfred Ave	• Signalize	No	Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	• Add NB left and change all shared to through-right • Add a WB left turn lane and change all shared to through-right ¹	Tribe land Yes	Capacity Capacity
	5	Labath Ave/ Wilfred Ave	• Signalize • Add EB left and change EB all shared to through-right ¹ • Add WB left and change WB all shared to through-right ¹ • Add NB right and change NB all shared to left-through	No Yes Yes Yes	Capacity Capacity Capacity Tribeland
	6	Dowdell Ave/ Wilfred Ave	• Signalize • Add WB left and change WB all shared to through-right ¹ • Add EB left and change EB all shared to through-right ¹	No Yes Yes	Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	• Change WB left-through to WB through • Change phasing east-west to protected from split • Add EB left and EB right and change EB all shared to through ¹	No No Yes	Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	No mitigation necessary	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	Commerce Blvd/US-101 NB Ramps mitigation alleviates the impact	-	-
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	• Construct the State Farm-Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing	Yes	Capacity
	13	Project Driveway/ Stony Point Rd	No mitigation necessary	-	-
	14	Business Park Dr/ Labath Ave	No mitigation necessary	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	• Change SB through-right to all-shared • Change NB/SB phasing from protected to split phasing • Extend SB left turn bay to 350 feet (from 100 feet)	Yes No Yes	Capacity Capacity Queue
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Extend NB left turn bay to 400 feet (from 225 feet) • Add second NB left turn lane	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	• Optimize signal timing	No	Capacity
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

¹ In summary, widen Wilfred Ave to three lanes from Langer Ave to Redwood Dr

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	1	Stony Point Rd/ Wilfred Ave	• Signalize	No	Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	• Add NB left and change all shared to through-right * • Signalize	Tribe land No	Capacity Capacity
	5	Labath Ave/ Wilfred Ave	• Signalize * • Optimize signal timing • Add NB right and change NB all shared to through-left *	No No Tribe land	Capacity Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	• Signalize * • Optimize signal timing	No No	Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	• Optimize signal timing • Change WB left-through to through * • Change phasing east-west to protected from split *	No Yes No	Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	Modified Intersection (not analyzed)	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	Modified Intersection (Combined with Intersection #12)	-	-
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	• Modify intersection to realign Wilfred Avenue, Commerce Boulevard, Golf Course Drive, and US-101 NB Ramps and combine with the Golf Course Dr/Commerce Blvd intersection. The southbound approach will be from Wilfred Avenue, the northbound approach will be from Commerce Boulevard, the eastbound approach will be from the US-101 NB off-ramp, and the westbound approach will be from Golf Course Drive. • Construct the State Farm-Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing*	Yes Yes	Capacity Capacity
	13	Project Driveway/ Stony Point Rd	No mitigation necessary	-	-
	14	Business Park Dr/ Labath Ave	No mitigation necessary	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	• Change SB through-right to all-shared * • Change NB/SB phasing from protected to split phasing * • Extend SB left turn bay to 350 feet (from 100 feet) *	Yes No Yes	Capacity Capacity Queue
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Extend NB left turn bay to 400 feet (from 225 feet) * • Add second NB left turn lane *	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	No mitigation necessary	-	-
	22	Gravenstein Hwy/ Stony Point Rd	• Add an EB right turn bay for 100 feet • Optimize signal timing	Yes No	Capacity Capacity
	23	Gravenstein Hwy/ Redwood Dr	• Optimize signal timing	No	Capacity
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

* Improvement assumed to occur with 2008 mitigation

Table A 6 – Alternative A Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008						2020					
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	C	25.4	F	841.3	F	OVRFL	D	35.2
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	13.8	B	13.8	B	12.5	C	16.2	C	16.2
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	13.8	B	13.8	B	12.5	C	15.8	C	15.8
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	F	51.3	C	18.0	B	12.5	F	111.1	C	26.5
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	C	26.9	F	OVRFL	F	OVRFL	C	25.8
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	B	10.8	F	OVRFL	F	OVRFL	C	35.0
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	148.7	D	37.5	F	169.9	F	182.3	D	40.2
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	22.5	C	27.5	-	-	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	27.7	C	22.3	C	26.8	D	45.7	C	24.3
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	E	69.4	C	46.9	E	74.2	F	96.2	-	-
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	14.6	C	20.1	B	19.0	B	19.7	B	12.4
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	64.8	D	48.5	D	50.8	E	66.2	C	28.5
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	-	-	-	-	-	B	10.6	B	12.9	-	-	B	10.3	B	12.4
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	D	27.5	C	16.7	C	22.2	C	22.2
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	B	19.8	B	19.8	B	18.5	C	21.7	C	21.7
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	D	43.3	C	28.6	C	28.2	D	40.6	C	28.2
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	26.0	C	26.8	C	29.1	C	26.4	C	27.0
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.2	B	18.6	B	16.0	B	16.0	B	16.0
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	18.5	B	12.5	B	12.3	B	17.4	B	11.3
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	38.9	C	32.0	E	63.4	C	33.0	C	37.2
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	37.6	D	37.6	D	45.5	F	118.2	D	54.5
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	27.0	C	27.0	D	42.4	E	56.3	D	52.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.1	B	19.1	B	18.1	B	19.6	B	19.6
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.4	B	11.4	B	11.5	B	11.4	B	11.4
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	72.0	B	10.6	F	90.2	F	156.3	B	10.1
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.6	B	11.6	B	12.4	B	12.2	B	12.2
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.7	B	11.7	B	12.5	B	12.4	B	12.4
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	B	11.0	B	11.0	B	11.3	B	11.4	B	11.4
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	12.0	B	12.0	B	14.7	B	13.7	B	13.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.4	B	11.7	B	11.4	B	11.4

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table A7**:

- Adjust the ramp metering to account for the additional project traffic at the Wilfred Avenue interchange in the long-term (2020). Most metering adjustments can be minor and are not expected to have queuing effects on the local street network. However, the southbound on-ramp will require heavy metering to obtain an acceptable level of service for the freeway ramp merge area which may create a long queue backed up on the ramp.
- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to south of Gravenstein Highway (SR-116) as well as an additional traffic lane in the northbound direction from West Sierra Avenue to Gravenstein Highway (SR-116) in the long-term (2020).

Aside from roadway improvements to mitigate protect impacts, the casino and hotel should coordinate with the Green Music Center during outdoor events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park interchange may be necessary. Therefore, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur, the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control

Because no fixed route service will be available at the project site, the casino/hotel should provide a shuttle that serves the two Rohnert Park transfer stations. The shuttle should run throughout the day or could be called out on demand. The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

Table A 7 – Alternative A Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt A		2020		2020 + Alt A		2020 + Alt A Mitigated	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound													
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	D	26.9	C	25.6	E	38.4	E	38.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	E	35.2	D	34.1	F	41.8	D	29.1
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	E	36.5	E	36.1	F	43.1	E	40.4
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	31.7	D	32.3	F	-	E	40.4
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	33.9	E	37.1	F	42.1	E	40.4
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	24.5	C	23.2	C	25.9	C	25.9
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	31.2	D	29.0	E	39.1	E	39.1
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	31.2	D	29.0	E	39.1	E	39.1
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	31.2	D	29.0	E	39.1	E	39.1
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.6	E	40.4	E	41.0	E	41.0
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.6	E	40.4	E	41.0	E	41.0
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.6	E	40.4	E	41.0	E	41.0
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.8	D	29.7	D	32.6	D	32.6
Southbound													
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	26.1	D	28.5	D	31.2	D	31.2
Santa Rosa Avenue SB On-Ramp	E	D	31.2										
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	36.2	F	-	F	-	C	24.8
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.8	F	44.8	F	46.8	D	33.0
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	39.4	E	39.9	F	48.8	D	34.2
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	39.4	E	39.9	F	48.8	D	34.2
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	39.4	E	39.9	F	48.8	D	34.2
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	35.4	E	38.5	F	41.3	C	26.1
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	36.1	F	37.5	F	43.0	D	40.0
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	29.8	E	36.6	F	-	D	40.0
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	E	36.1	F	40.3	F	47.2	D	40.0
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	38.3	F	42.3	F	48.5	D	29.7
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	29.0	D	32.0	F	-	C	23.5

It is recommended that the casino contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.



Graton Rancheria Alternative A – Rohnert Park, CA

PROJECT LOCATION

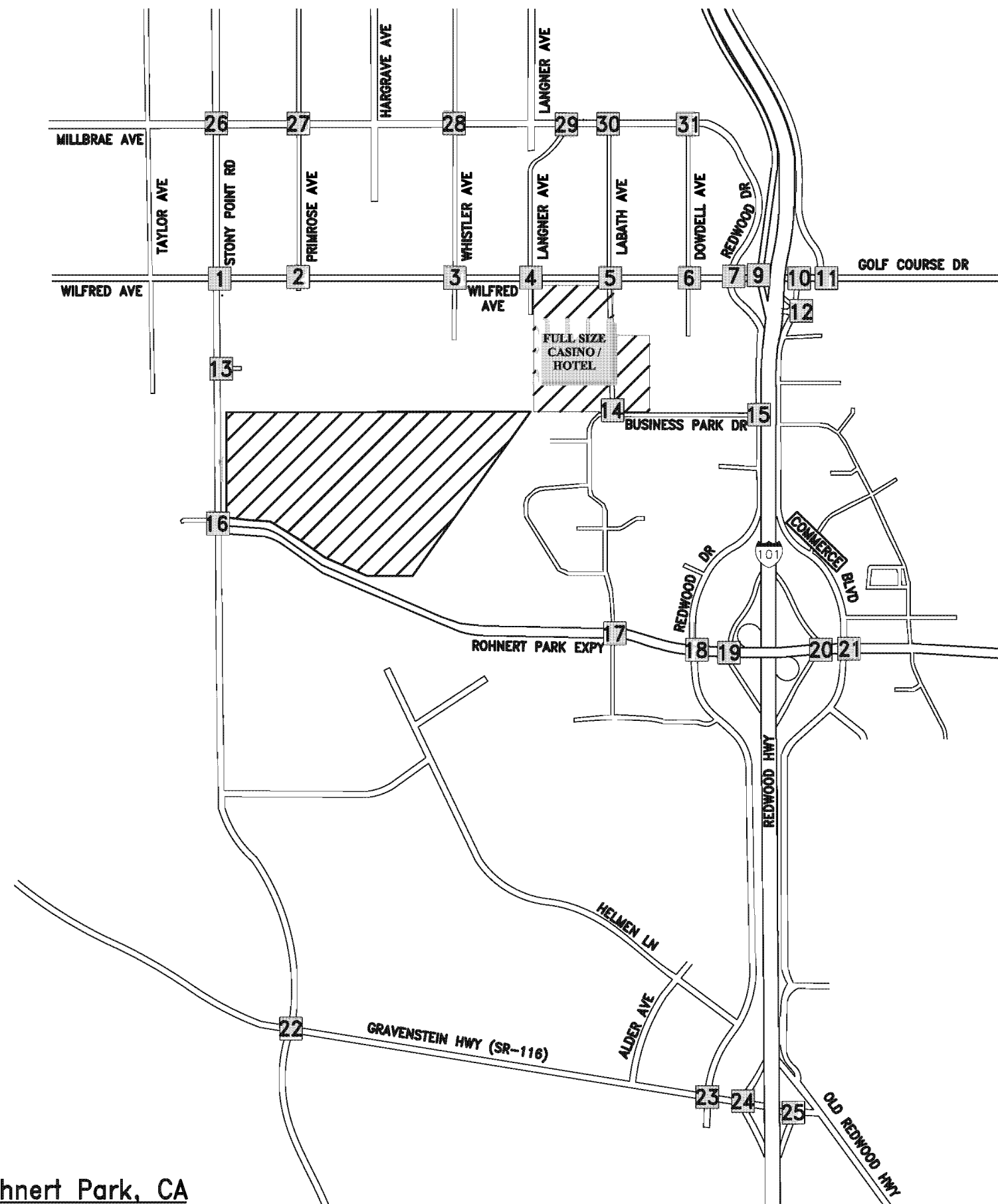


FIGURE A1





Graton Rancheria Alternative A – Rohnert Park, CA

SITE PLAN

FIGURE A2



Graton Rancheria Alternative A - Rohnert Park, CA

TRIP DISTRIBUTION - IN

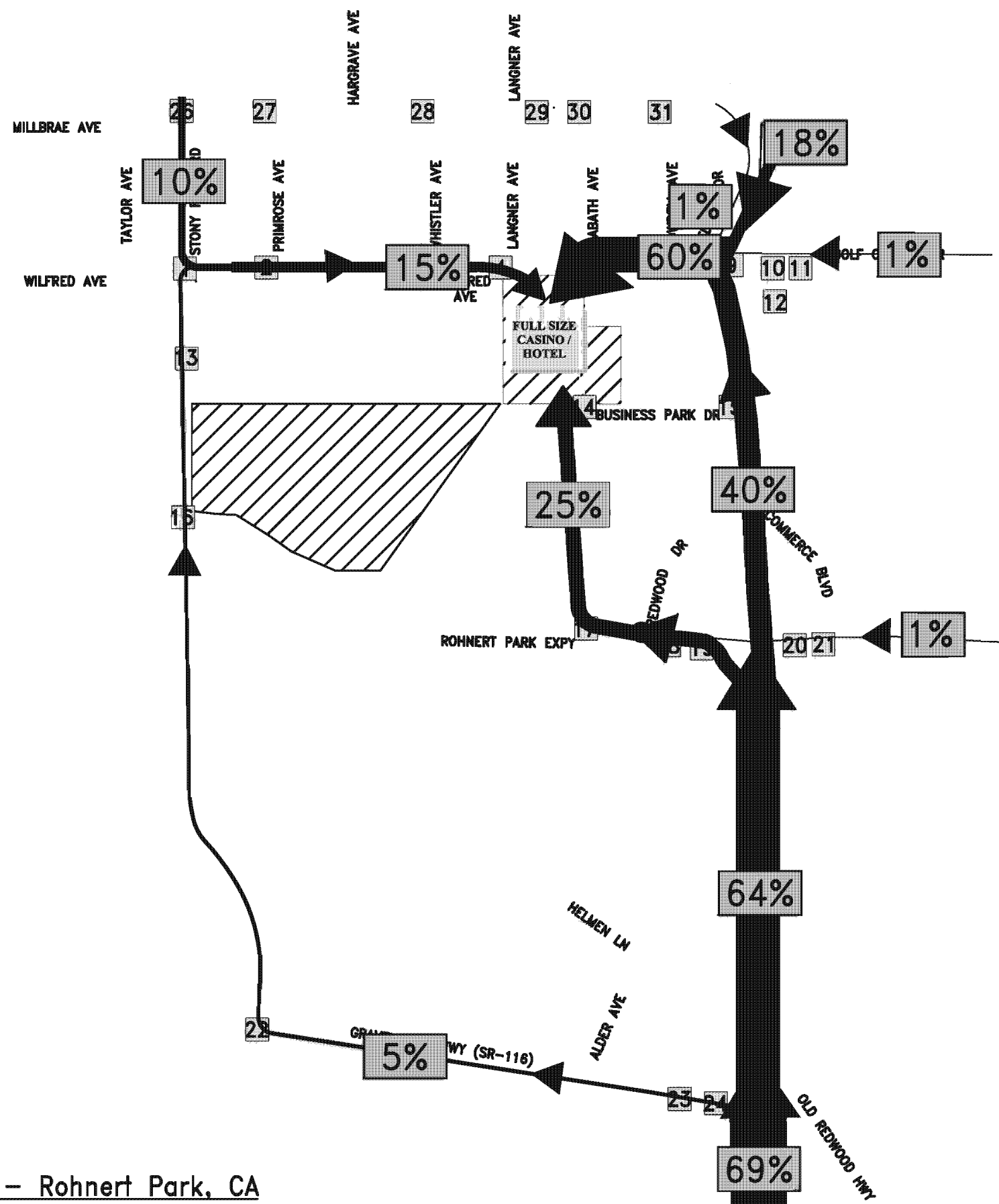


FIGURE A3



Kimley-Horn and Associates, Inc.



Graton Rancheria Alternative A - Rohnert Park, CA

TRIP DISTRIBUTION - OUT

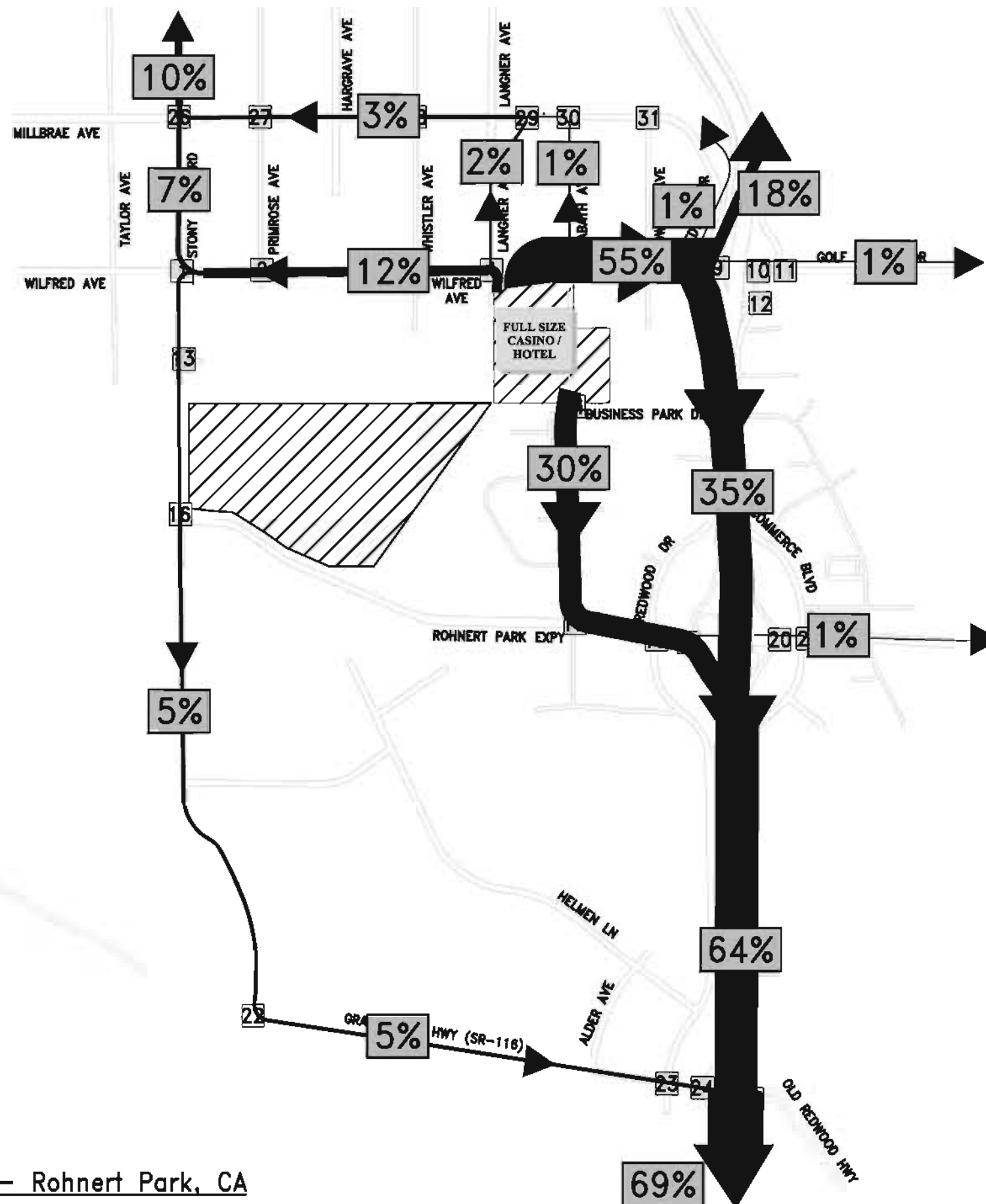
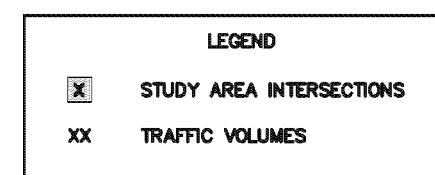
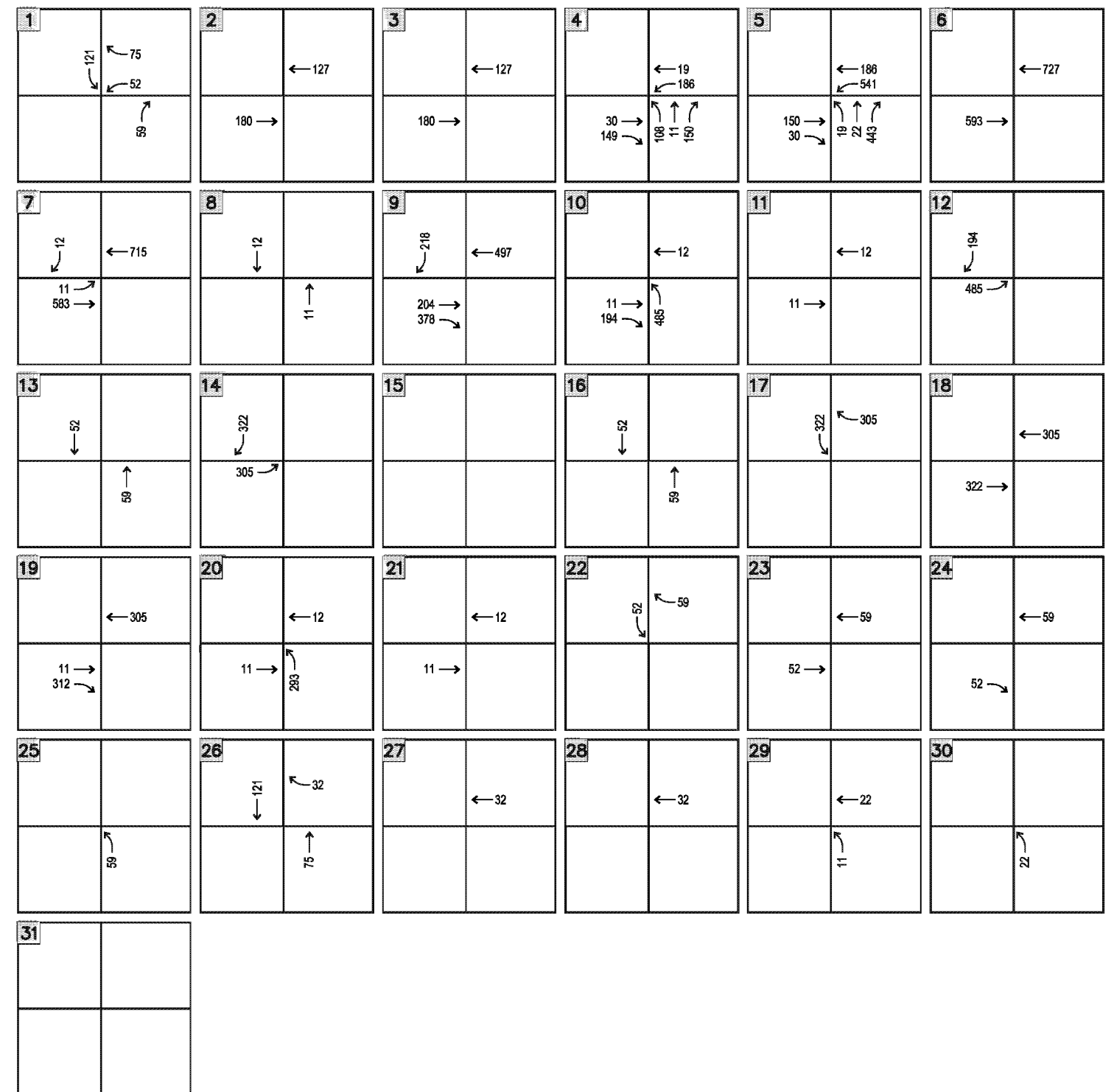
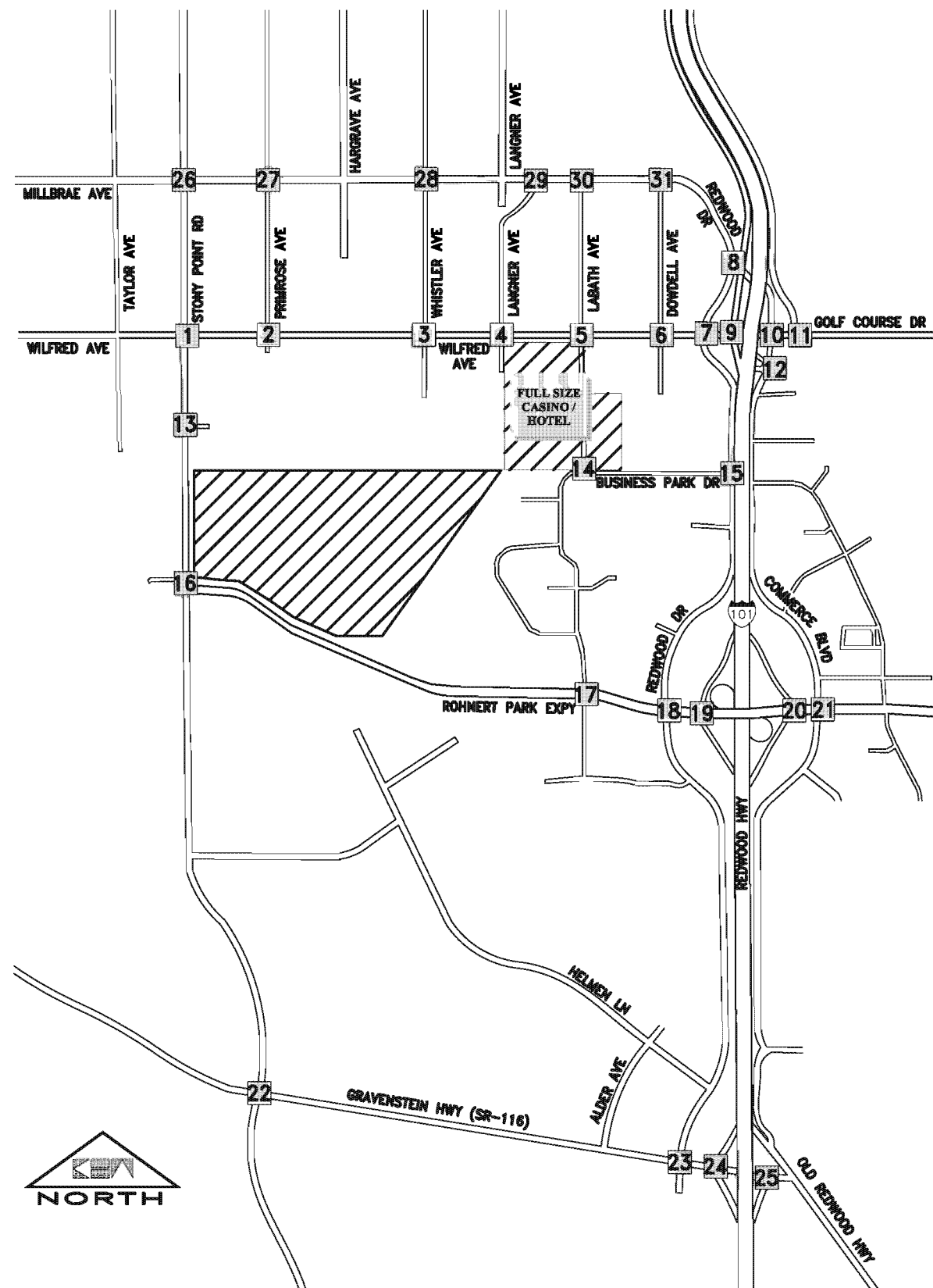


FIGURE A4



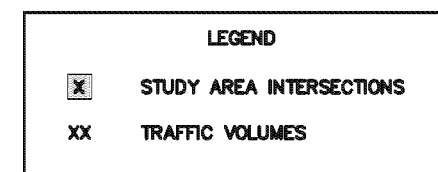
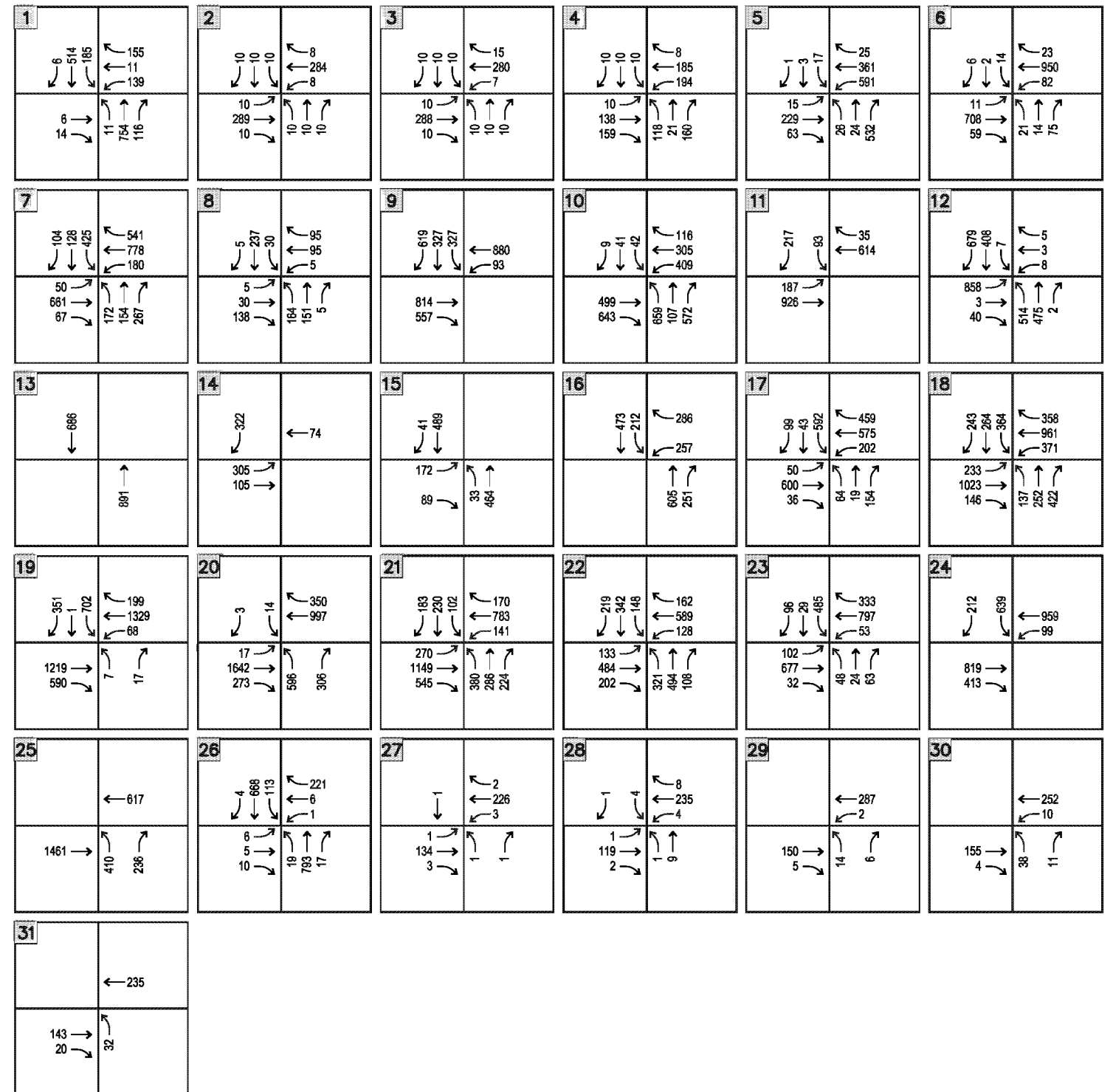
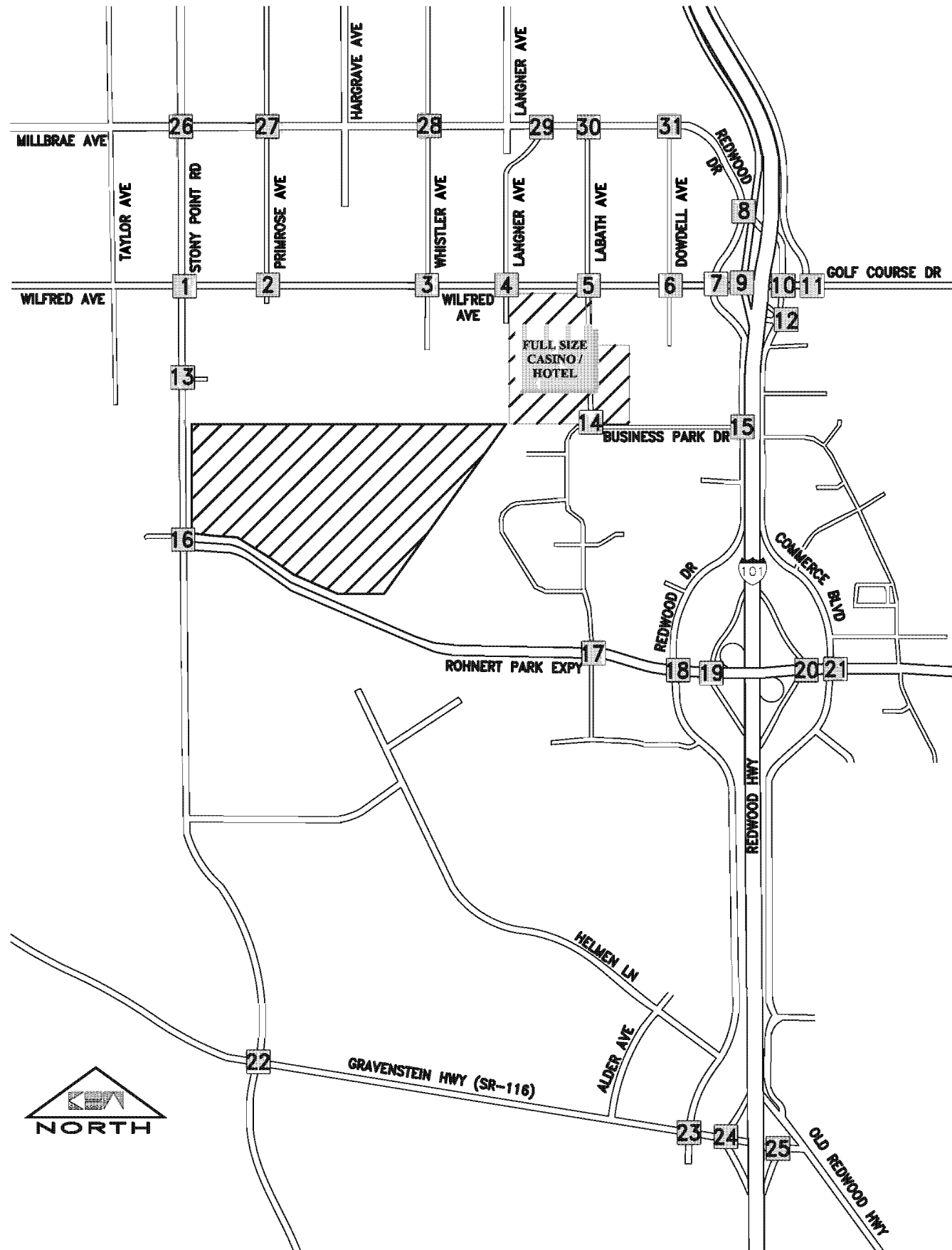


Graton Rancheria Alternative A - Rohnert Park, CA

PROJECT GENERATED PM TRAFFIC VOLUMES

FIGURE A5



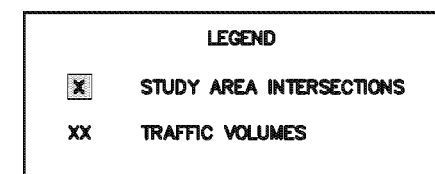
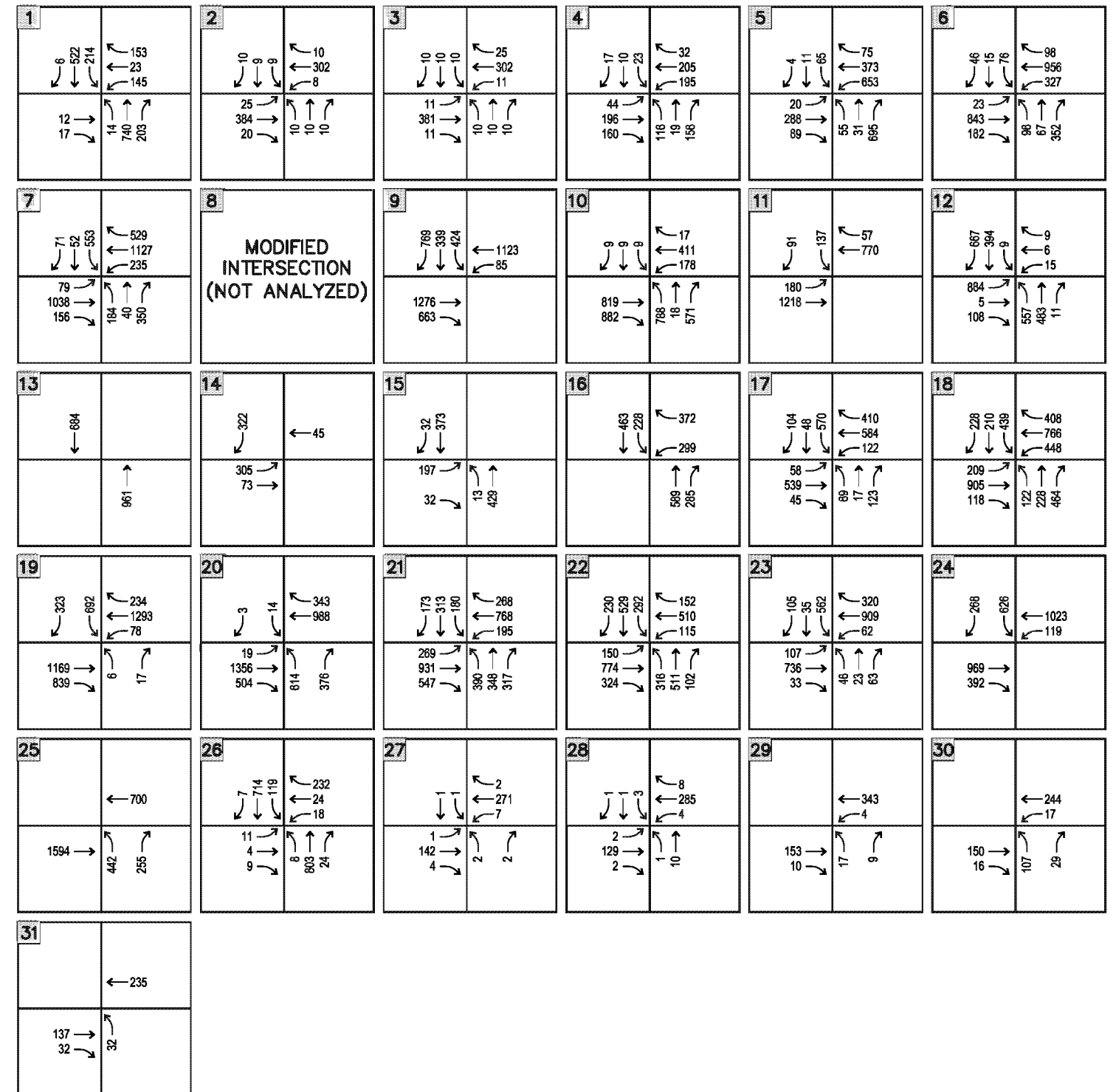
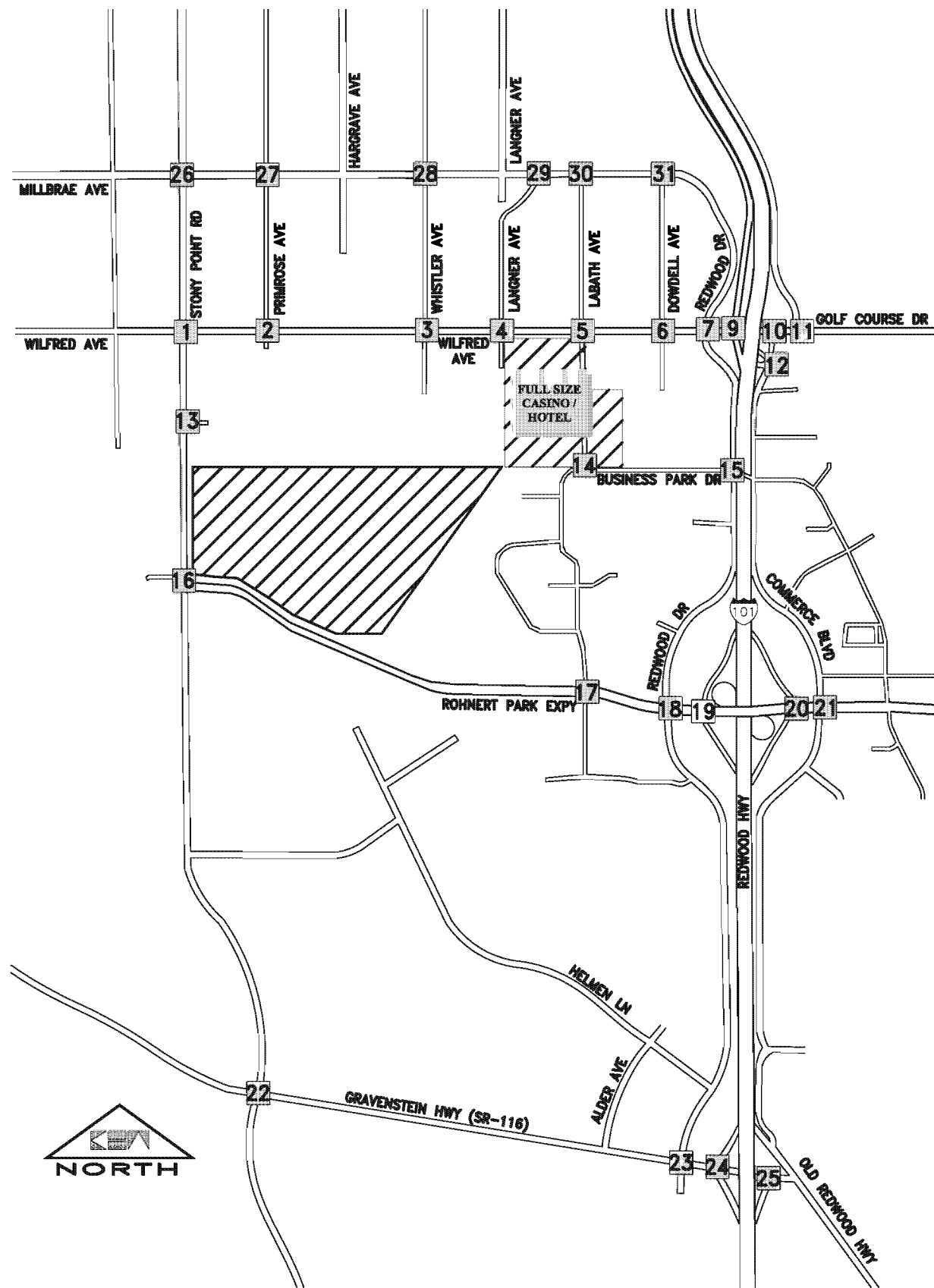


Graton Rancheria Alternative A - Rohnert Park, CA

NEAR-TERM + PROJECT PM TRAFFIC VOLUMES

FIGURE A6



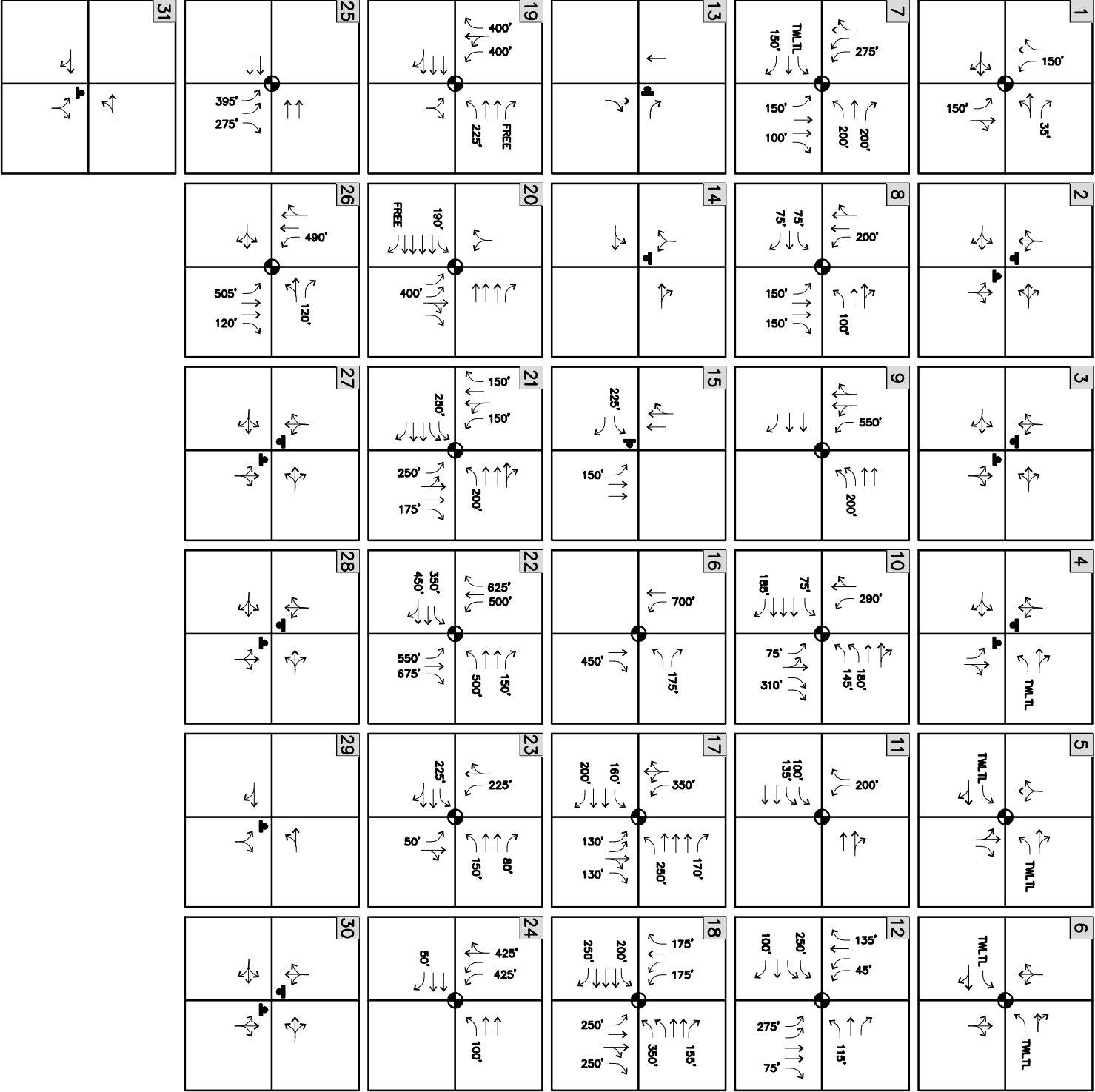
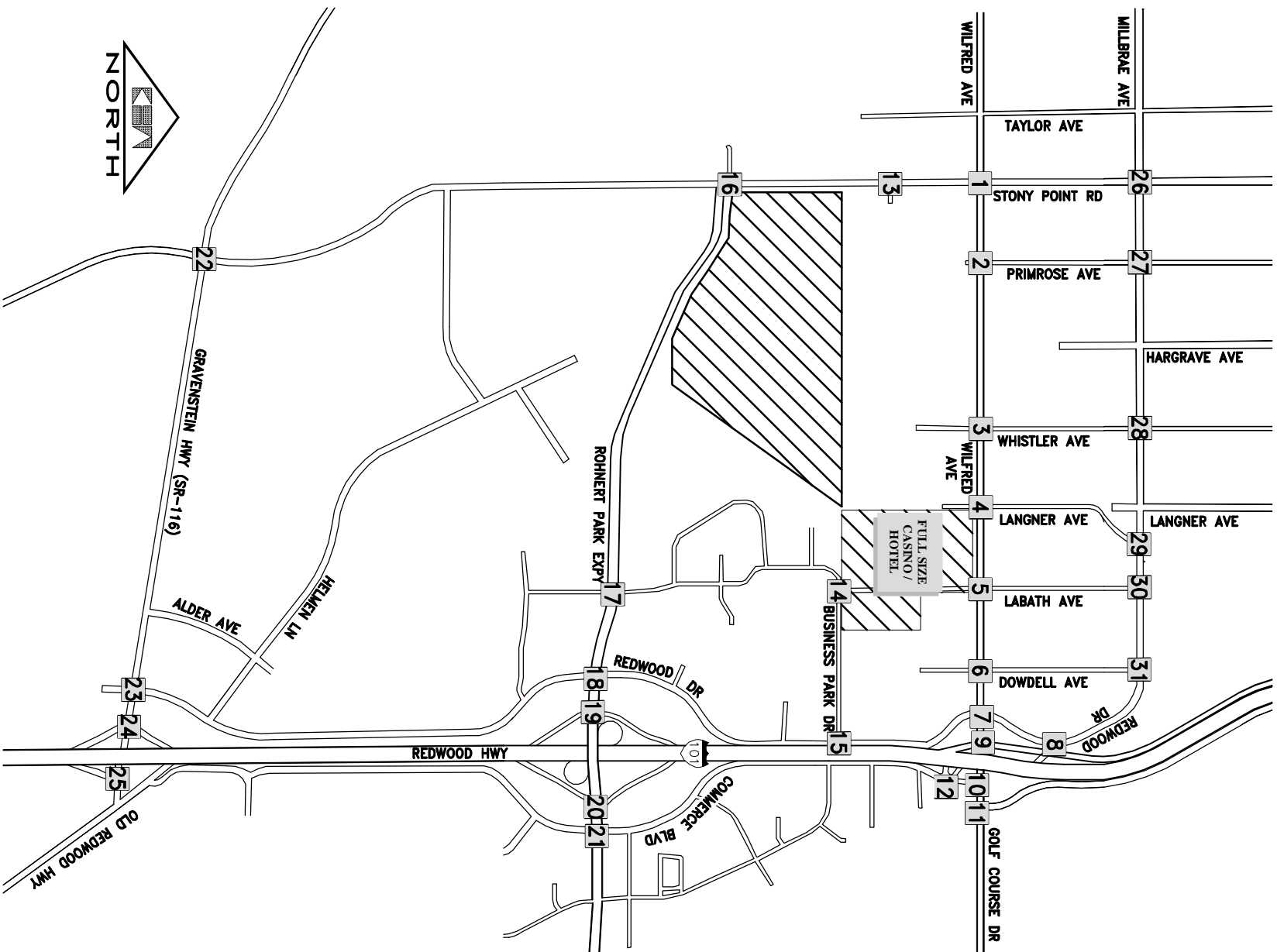


Graton Rancheria Alternative A - Rohnert Park, CA

LONG-TERM CUMULATIVE + PROJECT PM TRAFFIC VOLUMES

FIGURE A7





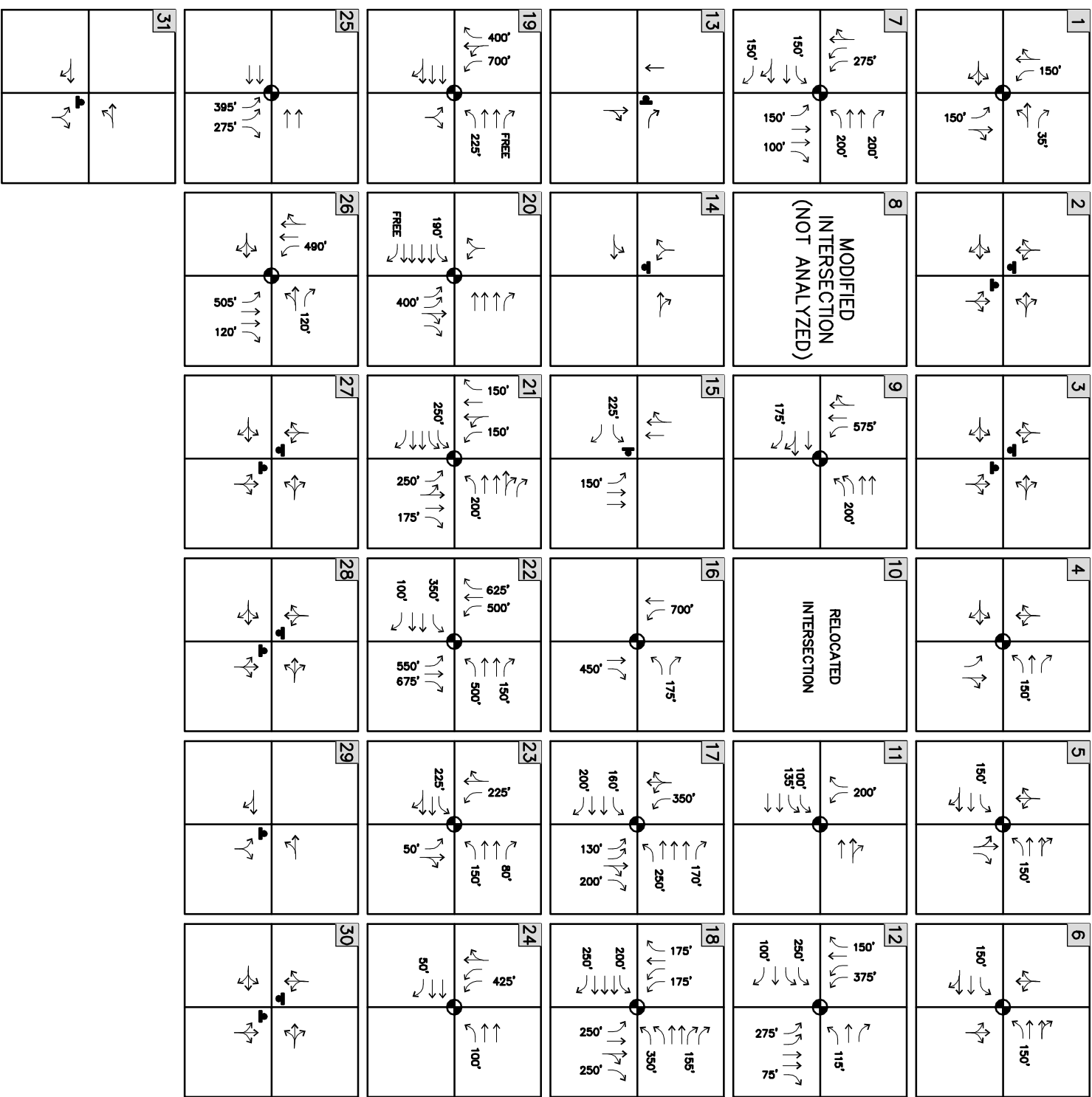
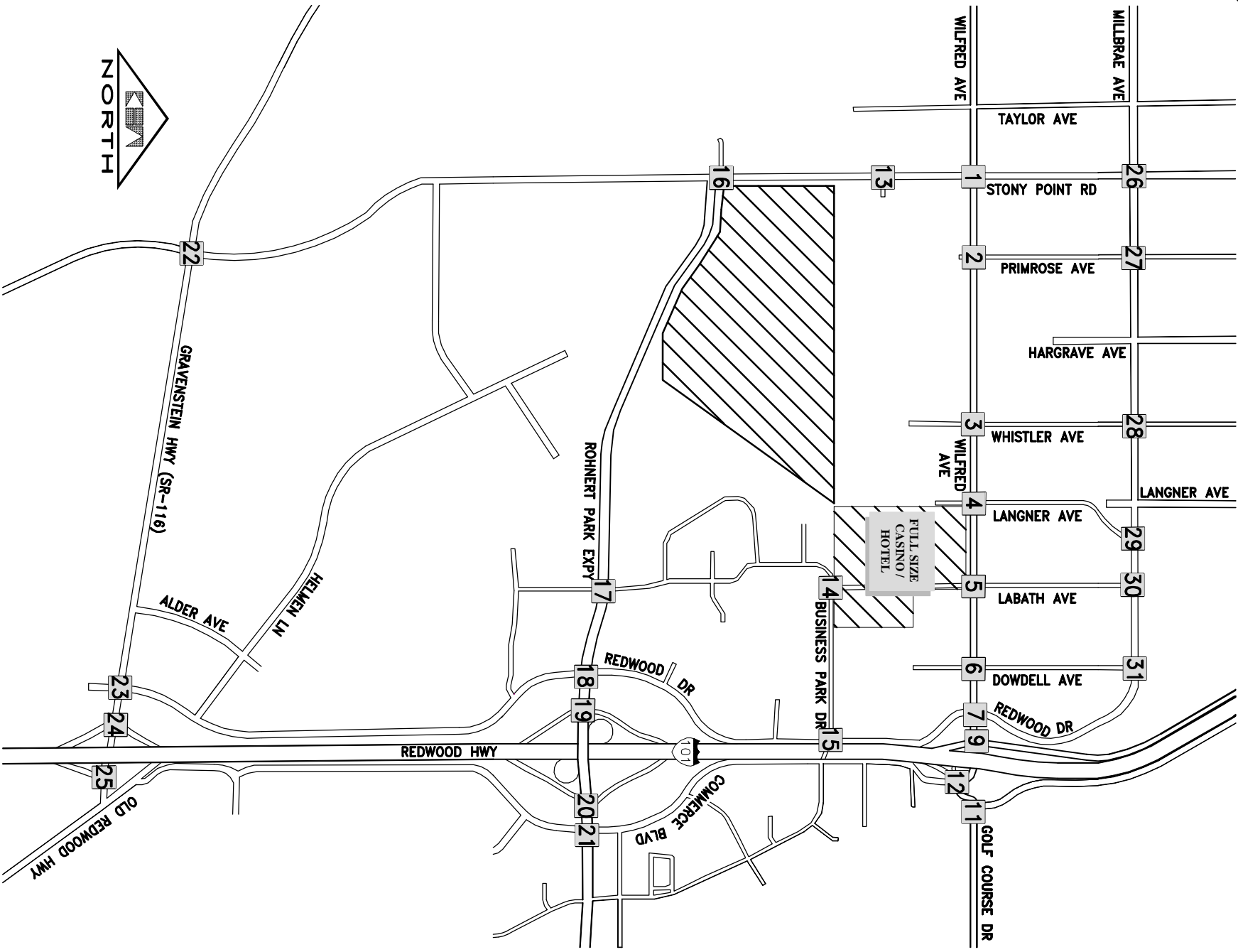
LEGEND

- STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- STORAGE LENGTH

Graton Rancheria Alternative A – Rohnert Park, CA

NEAR-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE A8



Graton Rancheria Alternative A – Rohnert Park, CA

LONG-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE A9

ALTERNATIVE B – NORTHWEST STONY POINT SITE

The Alternative B casino and hotel is proposed to be located as shown in **Figure B1**, which is bordered by Wilfred Avenue in the north, Rohnert Park Expressway in the south, Stony Point Road in the west, and Langner Avenue in the east.

The site layout as shown in **Figure B2** includes a main building of approximately 450,000 square feet for a casino, restaurants, food court, event center, banquet facilities, lobby, pool, and other ancillary functions. In addition, the project is planned to include up to 300 hotel rooms, primarily for casino guests.

A breakdown of square footage as it relates to traffic impacts is shown below:

- Casino and Entertainment areas – 408,150 s.f.
- Lobby/Bar/Back of House/Sundries – 14,750 s.f.
- Pool and Spa – 27,100 s.f.
450,000 s.f.
- Hotel Rooms – 291,000 s.f.

The site plan also shows supporting uses such as parking lots, parking structure, and wastewater treatment facilities.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Site Access

The main project access is from the south side of Wilfred Avenue, where an existing driveway aligns with Primrose Avenue. This approach is assumed to operate as a full movement driveway with no turn limitations.

A second project access from Stony Point Road is located on this plan approximately 880 feet south of the Stony Point Road/Wilfred Avenue intersection. The location is at an existing driveway access; however, due to conflicts with the northbound turn bay at the Stony Point Road/Wilfred Avenue intersection, the access is assumed to be limited to right in/out operation.

Currently, neither access is signalized.

Trip Generation – Alternative B

Trip generation for Alternative B is identical to Alternative A. See Trip Generation – Alternatives A, B, and C section under Alternative A for specific information.

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to destinations north of the site, with the remaining 70% distributed south of the site. To be conservative, only a small percentage of project traffic was assumed to be generated or attracted in the immediate vicinity of the project site. The project traffic distribution is shown in **Figure B3** and **Figure B4**. **Figure B5** illustrates project traffic assigned to the study intersections based on the assumed trip distribution. As seen in **Figure B5**, most of the project traffic is expected to come from the freeway therefore it was assumed that most of the traffic would use Primrose Avenue because of its closer proximity to the freeway. As noted in the distribution, some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the Alternative B casino and hotel project. **Figure B6** illustrates the combined near-term turning movement volumes at the study intersections.

Cumulative Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the Alternative B casino and hotel project. **Figure B7** illustrates the combined long-term turning movement volumes at the study intersections.

Alternative B LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions:

- Near-term conditions with Alternative B (year 2008)
- Long-term Cumulative conditions with Alternative B (year 2020)

In the near-term analysis for Alternative B, it was assumed that the Wilfred Avenue widening project will not have taken place before the casino/hotel opens. The Memorandum of Understanding (MOU) between the City of Rohnert Park and the Federated Indians of the Graton Rancheria stated that the tribe would help financially to speed up the timeline of the widening project to occur before the casino/hotel opens in 2008.

Results of the analysis are presented in **Table B1**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst

approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

2008 Results

- Stony Point Road/Wilfred Avenue
- Primrose Avenue/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Labath Avenue
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

2020 Results

- Stony Point Road/Wilfred Avenue
- Primrose Avenue/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Wilfred Avenue/US-101 SB Ramps
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Labath Avenue
- Rohnert Park Expressway/Commerce Boulevard
- Gravenstein Highway (SR-116)/Redwood Drive
- Millbrae Avenue/Stony Point Road

Table B 1 – Alternative B Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	F	841.3	F	OVRFL
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	OVRFL	B	12.5	F	OVRFL
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	86.6	B	12.5	F	115.2
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	F	82.9	B	12.5	F	114.3
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	313.1	F	169.9	F	274.0
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	25.0	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	32.0	C	26.8	D	36.7
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	82.3	E	74.2	F	127.2
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.5	B	19.0	B	19.3
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	60.5	D	50.8	F	129.0
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	D	27.6	A	0.0	C	24.6
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	D	43.0	B	18.5	C	32.2
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	D	39.5	C	28.2	E	59.8
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	26.1	C	29.1	C	28.1
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.7	B	16.0	B	16.0
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	C	21.3	B	12.3	C	23.3
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	38.1	E	63.4	E	57.6
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	44.0	D	45.5	D	52.8
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	28.1	D	42.4	E	63.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	C	20.4	B	18.1	B	18.6
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	12.8	B	11.5	B	12.6
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	69.0	F	90.2	F	204.7
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.5	B	12.4	B	12.4
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.5	B	12.5	B	12.5
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.7	B	11.7

Alternative B Traffic Signal Warrant Analysis

Alternative B, near-term and long-term, traffic volumes at unsignalized study intersections were compared against peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersections will satisfy traffic signal Warrant #3 by year 2008 and 2020.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Primrose Avenue/Wilfred Avenue (2008 and 2020)
- Labath Avenue/Wilfred Avenue (2008 and 2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Project Driveway/Stony Point Road (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Alternative B LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed casino and hotel were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the casino and hotel project. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table B2**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project.

Table B 2 – Alternative B Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt B		2020		2020 + Alt B	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	25.1	C	25.6	E	38.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	33.7	D	34.1	F	41.8
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	E	35.2	E	36.1	F	43.1
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	28.8	D	32.3	F	-
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	34.2	E	37.1	F	43.7
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	21.8	C	23.2	C	26.7
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	29.1	D	29.0	E	37.4
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	29.1	D	29.0	E	37.4
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	29.1	D	29.0	E	37.4
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.9	E	40.4	F	44.3
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.9	E	40.4	F	44.3
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.9	E	40.4	F	44.3
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.8	D	29.7	D	32.6
Southbound											
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	26.1	D	28.5	D	31.2
Santa Rosa Avenue SB On-Ramp	E	D	31.2								
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	39.3	F	-	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.8	F	44.8	F	49.7
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	F	45.0	E	39.9	F	54.1
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	F	45.0	E	39.9	F	54.1
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	F	45.0	E	39.9	F	54.1
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	34.5	E	38.5	F	43.0
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	34.1	F	37.5	F	42.3
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	27.1	E	36.6	F	-
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	34.0	F	40.3	F	46.2
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	37.2	F	42.3	F	48.5
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	27.4	D	32.0	F	-

Potential Effects on Intersection Safety

Traffic volumes generated by the project were reviewed in consideration of existing intersection collision history and the potential for increased accidents. According to collision data, accidents involving bicyclist and pedestrians are very low. Many intersections did not report any collisions of this type during the survey period. This suggests that bicycle and pedestrian volumes are relatively low and study intersections have minimal safety hazards for individuals biking or walking. Although the project will introduce increased traffic volumes at some intersections, bicyclists and pedestrians are expected to be able to travel through study intersections with similar levels of safety. Historically casinos do not attract a significant amount of bicycle and pedestrian traffic. . Therefore, the expected amount of pedestrian and bicycle traffic is nominal and a significant increase in bicycle and pedestrian accidents is unlikely.

The potential for increased collisions between motorized vehicles was also considered. Collision frequency and severity are a function of many complex factors that vary depending on the location and type of intersection or roadway segment. Factors include traffic control such as signals or stop signs, lane and shoulder widths, grades, driveway densities, roadside hazards or obstacles, presence of left and right turn lanes, sight distance, congestion, and others.

Because of the number and interrelationships of the variables, accurate crash prediction is difficult. However, the proposed casino and hotel project will increase roadway congestion, a factor which could result in an increase in traffic collisions if left unmitigated. Other factors are expected to remain unaffected.

As noted previously, the purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development. This includes mitigation improvements to restore traffic operations to levels within acceptable standards or to levels as good as or better than without the casino/hotel project. Any potential increases in accidents due to project-related traffic would be offset by the implementation of roadway improvements included as mitigation. Therefore, if mitigations are implemented as proposed in this report, no significant increase in daytime or nighttime collisions is expected.

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table B3**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.



Table B 3 – Alternative B Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020
1 Stony Point Road and Wilfred Avenue	EBL			
	EBR			
	WBL			
	WBR	35	OVFL	OVFL
	NBL	150	25	25
	NBR			
4 Langner Avenue and Wilfred Avenue	SBL	150	30	32
	SBR			
	EBL			
	EBR			
	WBL	150		25
	WBR			
5 Labath Avenue and Wilfred Avenue	NBL			
	NBR			
	SBL			
	SBR			
	EBL	150		25
	EBR			
6 Dowdell Avenue and Wilfred Avenue	WBL	150		29
	WBR			
	NBL			
	NBR			
	SBL			
	SBR			
7 Redwood Drive and Wilfred Avenue	EBL	150		25
	EBR			
	WBL	150		529
	WBR			
	NBL			
	NBR			
8 Redwood Drive and Commerce Boulevard	SBL			
	SBR			
	EBL	150		203
	EBR	150		304
	WBL			
	WBR			
9 Wilfred Avenue and SB US 101 Ramps	NBL	150	402	1271
	NBR	100	95	110
	SBL	275	350	350
	SBR			
	EBL	75	25	
	EBR	75	50	
10 Golf Course Drive and Commerce Blvd	WBL	100	25	
	WBR			
	NBL	150	134	
	NBR	150	25	
	SBL	200	40	
	SBR			
11 Roberts Lake Drive and Golf Course Drive	EBL			
	EBR			
	WBL	300	30	25
	WBR			
	NBL			
	NBR			
12 Commerce Blvd and NB US 101 Ramps	SBL	250	229	251
	SBR			
	EBL			
	EBR			
	WBL	150	789	1000
	WBR			
15 Business Park Drive and Redwood Drive	NBL	150	876	1007
	NBR	200	94	30
	SBL			
	SBR			
	EBL	80	100	52
	EBR			
16 Stony Point Road and Rohnert Park Expy	WBL			
	WBR			
	NBL			
	NBR			
	SBL			
	SBR			
17 Labath Avenue and Rohnert Park Expy	EBL			
	EBR			
	WBL			
	WBR			
	NBL			
	NBR			
18 Redwood Drive and Rohnert Park Expy	SBL			
	SBR			
	EBL	160	61	111
	EBR	200	25	29
	WBL	250	57	31
	WBR	170	25	25
19 SB US 101 Ramps and Rohnert Park Expy	NBL	130	36	38
	NBR	130	36	37
	SBL	100	193	202
	SBR			
	EBL	200	136	113
	EBR	200	25	25
20 NB US 101 Ramps and Rohnert Park Expy	WBL	350	148	150
	WBR	155	33	29
	NBL	250	157	210
	NBR	250	65	106
	SBL	175	188	172
	SBR	175	58	57
21 Commerce Blvd and Rohnert Park Expy	EBL			
	EBR			
	WBL	225	51	53
	WBR			
	NBL			
	NBR			
22 Stony Point Road and Gravenstein Hwy	SBL	400	318	238
	SBR	400	230	302
	EBL	190	25	25
	EBR			
	WBL			
	WBR			
23 Redwood Road and Gravenstein Hwy	NBL	225	543	587
	NBR			
	SBL			
	SBR			
	EBL	250	65	55
	EBR			
24 Gravenstein Hwy and SB US 101 Ramps	WBL	200	187	222
	WBR			
	NBL	250	210	214
	NBR	175	56	58
	SBL	150	98	158
	SBR	150	51	47
25 Gravenstein Hwy and NB US 101 Ramps	EBL	350	162	183
	EBR			
	WBL	500	155	170
	WBR	150	50	51
	NBL	550	296	298
	NBR	675	30	31
26 Stony Point Road and Millbrae Avenue	SBL	500	243	255
	SBR	625	49	54
	EBL	225	161	194
	EBR			
	WBL	150	57	54
	WBR	80	25	261
27 Stony Point Road and Millbrae Avenue	NBL	50	65	65
	NBR			
	SBL	225	388	556
	SBR			
	EBL	50	111	123
	EBR	100	103	72
28 Stony Point Road and Millbrae Avenue	WBL			
	WBR			
	NBL			
	NBR			
	SBL	425	222	222
	SBR			
29 Stony Point Road and Millbrae Avenue	EBL			
	EBR			
	WBL			
	WBR			
	NBL	395	162	162
	NBR	275	176	201
30 Stony Point Road and Millbrae Avenue	SBL			
	SBR			
	EBL			
	EBR			
	WBL	120	46	201
	WBR	505	25	25
31 Stony Point Road and Millbrae Avenue	NBL	120	25	25
	NBR			
	SBL	490	25	25
	SBR			
	EBL			
	EBR			

Alternative B Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Alternative B traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown on **Table B4** are needed in the near-term (2008) and long-term (2020) to mitigate project impacts.

The basis of the Alternative B mitigations is the assumption that intersection #13, the Project Driveway at Stony Point Road, should be relocated further south along Stony Point Road and be signalized so that it can function as a full movement access. This change permits more project traffic to conveniently arrive and exit from the site and use the Rohnert Park Expressway interchange, thus relieving some the traffic pressure through the Wilfred Avenue interchange. In the event that intersection #13 cannot be relocated and signalized as discussed above, additional mitigation improvements will be needed, particularly at intersections surrounding the Wilfred Avenue interchange. The project will create a significant unavoidable impact at the intersection of Commerce Boulevard/US-101 NB Ramps regardless of the relocation of intersection #13.

Table B5 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections.

Figures B8 and B9 illustrate the mitigated lane geometry and traffic control.

A single asterisk in the table denotes an intersection that operates at an acceptable level of service and does not require mitigation, but a mitigated level of service and delay are provided for reference as a result of the mitigation to signalize the Project Driveway/Stony Point Road which changes traffic patterns at some intersections. A double asterisk indicates an intersection where the delay increases as a result of the mitigation to signalize the Project Driveway/Stony Point Road intersection.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue.

The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to the Urban Growth Boundary. From Langner Avenue west to Stony Point Road, Wilfred Avenue should be three lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and



should include Class II bike lanes out to Stony Point Road to connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Stony Point Road, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

Table B 4 – Alternative B Summary of Mitigations

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	1	Stony Point Rd/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Widen Wilfred to 3 lanes (Add WB left) ¹ 	No Yes	Capacity Capacity
	2	Primrose Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Add a NB right and change NB all shared to left-through Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ 	No Tribe land Yes	Capacity Capacity Capacity
	3	Whistler Ave/ Wilfred Ave	<ul style="list-style-type: none"> Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ 	Yes	Capacity
	4	Langer Ave/ Wilfred Ave	<ul style="list-style-type: none"> Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ 	Yes	Capacity
	5	Labath Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ 	No Yes	Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Add NB right and change NB all shared to left-through Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ 	No Yes Yes	Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	<ul style="list-style-type: none"> Add EB left ¹ and through and change EB all-shared to through-right Change WB left-through to through Change phasing east-west to protected from split 	Yes No No	Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	No mitigation necessary	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	<ul style="list-style-type: none"> Add an EB right overlap phase 	No	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	<ul style="list-style-type: none"> Extend SB right turn bay back to the Golf Course Dr/Commerce Blvd intersection as a drop lane (to 345 feet from 175 feet) Add a SB right overlap phase 	Yes No	Queue Capacity
	13	Project Driveway/ Stony Point Rd	<ul style="list-style-type: none"> Signalize Add NB right and change NB through-right to through Add WB left out of project driveway 	No Tribe land Tribe land	Capacity Capacity Capacity
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	<ul style="list-style-type: none"> Extend WB right turn bay to 400 feet (from 175 feet) 	Tribe land	Queue
	17	Rohnert Park Expwy/ Labath Ave	<ul style="list-style-type: none"> Optimize signal timing 	No	Capacity
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	<ul style="list-style-type: none"> Extend NB left turn bay to 600 feet (from 225 feet) Add a second NB left turn bay 	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	<ul style="list-style-type: none"> Optimize signal timing 	No	Capacity
	22	Gravenstein Hwy/ Stony Point Rd	<ul style="list-style-type: none"> Add an EB right turn bay for 100 feet Optimize signal timing 	Yes No	Capacity Capacity
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	<ul style="list-style-type: none"> Signalize 	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

¹ In summary, widen Wilfred Ave to three lanes from Stony Point Rd to Redwood Dr



Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	1	Stony Point Rd/ Wilfred Ave	<ul style="list-style-type: none"> Signalize * Widen Wilfred to 3 lanes (Add WB left) ¹* 	No Yes	Capacity Capacity
	2	Primrose Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize * Add a NB right * Add a NB left and change all shared to through Widen Wilfred to 3 lanes (Add WB left and EB left) ¹* 	No Tribe land Tribe land Yes	Capacity Capacity Capacity Capacity
	3	Whistler Ave/ Wilfred Ave	<ul style="list-style-type: none"> Widen Wilfred to 3 lanes (Add WB left and EB left) ¹* 	Yes	Capacity
	4	Langer Ave/ Wilfred Ave	<ul style="list-style-type: none"> Widen Wilfred to 3 lanes (Add EB left) ¹* 	Yes	Capacity
	5	Labath Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize * Optimize signal timing 	No No	Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize * Optimize signal timing Add a second WB left turn (250 feet) Add an EB right turn bay and change the EB through-right to through * Add 1 SB left turn bay and change all shared to through-right Add a NB right overlap phase Add 1 NB left turn bay and 1 NB right turn bay* and change all shared to through-right 	No No Yes Yes Yes No Yes	Capacity Capacity Capacity Capacity Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	<ul style="list-style-type: none"> Add WB through Change NB through to left-through Change phasing north-south to split from protected Optimize signal timing Change WB left-through to through * Change phasing east-west to protected from split * 	Yes Yes No No No No	Capacity Capacity Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	Modified Intersection (not analyzed)	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	<ul style="list-style-type: none"> Add an EB right overlap phase * 	No	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	• Significant Unavoidable Impact		
	13	Project Driveway/ Stony Point Rd	<ul style="list-style-type: none"> Signalize * Add NB right and change NB through-right to through * Add WB left out of project driveway * 	No Tribe land Tribe land	Capacity Capacity Capacity
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	<ul style="list-style-type: none"> Extend WB right turn bay to 400 feet (from 175 feet) * 	Tribe land	Queue
	17	Rohnert Park Expwy/ Labath Ave	<ul style="list-style-type: none"> Optimize signal timing 	No	Capacity
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	<ul style="list-style-type: none"> Extend NB left turn bay to 600 feet (from 225 feet) * Add a second NB left turn bay * 	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	<ul style="list-style-type: none"> Optimize signal timing * Add a third EB through lane that merges back into 2 lanes east of the intersection 	No Yes	Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	<ul style="list-style-type: none"> Add an EB right turn bay for 100 feet * Optimize signal timing * 	Yes No	Capacity Capacity
	23	Gravenstein Hwy/ Redwood Dr	<ul style="list-style-type: none"> Add a WB right turn overlap phase Optimize signal timing 	No No	Queue Capacity
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	<ul style="list-style-type: none"> Signalize 	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

¹ In summary, widen Wilfred Ave to three lanes from Stony Point Rd to the Urban Growth Boundary

* Improvement assumed to occur in 2008 mitigation

Table B 5 – Alternative B Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008						2020					
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	C	23.6	F	841.3	F	OVRFL	C	34.3
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	OVRFL	C	20.2	B	12.5	F	OVRFL	C	25.6
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	86.6	F	51.4	B	12.5	F	115.2	F	64.9
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	F	85.0	F	193.4	B	12.5	F	114.3	F	279.6
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	C	27.5	F	OVRFL	F	OVRFL	C	30.0
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	D	48.3	F	OVRFL	F	OVRFL	D	38.1
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	313.1	D	53.3	F	169.9	F	274.0	D	44.7
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	25.0	C	25.8	-	-	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	32.0	C	31.3	C	26.8	D	36.7	C	24.0 *
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	82.3	D	49.6	E	74.2	F	127.2	D	53.5
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.5	B	18.7	B	19.0	B	19.3	B	15.1
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	60.5	C	28.4	D	50.8	F	129.0	F	116.7
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	D	27.6	B	10.5	A	0.0	C	24.6	A	9.9
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	D	27.5	C	16.7	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	D	43.0	D	51.4 **	B	18.5	C	32.2	D	44.0
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	D	39.5	C	24.4	C	28.2	E	59.8	C	25.2
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	26.1	C	27.3	C	29.1	C	28.1	C	29.1
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.7	B	19.6 **	B	16.0	B	16.0	B	18.1
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	C	21.3	C	13.8	B	12.3	C	23.3	B	14.3
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	38.1	C	32.0	E	63.4	E	57.6	C	31.9
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	44.0	D	43.9	D	45.5	D	52.8	D	46.5
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	28.1	D	37.4 **	D	42.4	E	63.8	D	41.7
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	C	20.4	C	21.2 **	B	18.1	B	18.6	B	26.2 **
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	12.8	B	14.3 **	B	11.5	B	12.6	B	13.9 **
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	69.0	A	9.9	F	90.2	F	204.7	B	10.4
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.5	B	11.5	B	12.4	B	12.4	B	12.4
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.5	B	11.5	B	12.5	B	12.5	B	12.5
29	Millbrae Ave/ Langer Ave	D	TWSC	A	9.7	A	9.9	A	9.9	A	9.9	B	11.3	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	11.7	B	14.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.4	B	11.7	B	11.7	B	11.7

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table B6**:

- Adjust the ramp metering to account for the additional project traffic at the Wilfred Avenue interchange in the near-term (2008). Most metering adjustments can be minor and are not expected to have queuing effects on the local street network. However, the southbound on-ramp will require heavy metering to obtain an acceptable level of service for the freeway ramp merge area which may create a long queue backed up on the ramp.
- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Wilfred Avenue and from Gravenstein Highway (SR-116) to West Sierra Avenue as well as an additional traffic lane in the northbound direction from West Sierra Avenue to Gravenstein Highway (SR-116) in the long-term (2020).

Aside from roadway improvements to mitigate protect impacts, the casino and hotel should coordinate with the Green Music Center during outdoor events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park interchange may be necessary. Therefore, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur, the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control.

Because no fixed route service will be available at the project site, the casino/hotel should provide a shuttle that serves the two Rohnert Park transfer stations. The shuttle should run throughout the day or could be called out on demand.

The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

Table B 6 – Alternative B Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt B		2008 + Alt B Mitigated		2020		2020 + Alt B		2020 + Alt B Mitigated	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound															
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	25.1	C	25.1	C	25.6	E	38.4	E	38.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	33.7	D	33.7	D	34.1	F	41.8	D	29.3
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	E	35.2	E	35.2	E	36.1	F	43.1	E	42.1
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	28.8	D	28.8	D	32.3	F	-	E	42.1
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	34.2	D	34.2	E	37.1	F	43.7	E	42.1
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	21.8	C	21.8	C	23.2	C	26.7	C	26.7
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	29.1	D	29.1	D	29.0	E	37.4	E	37.4
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	29.1	D	29.1	D	29.0	E	37.4	E	37.4
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	29.1	D	29.1	D	29.0	E	37.4	E	37.4
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.9	D	33.9	E	40.4	F	44.3	E	43.0
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.9	D	33.9	E	40.4	F	44.3	E	43.0
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.9	D	33.9	E	40.4	F	44.3	E	43.0
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.8	C	23.8	D	29.7	D	32.6	D	32.6
Southbound															
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	26.1	D	26.1	D	28.5	D	31.2	D	31.2
Santa Rosa Avenue SB On-Ramp	E	D	31.2	D	32.7	E	39.3	E	39.3	F	-	F	-	C	24.8
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	39.3	E	39.3	F	-	F	-	C	24.8
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.8	E	40.8	F	44.8	F	49.7	D	34.1
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	F	45.0	D	33.6	E	39.9	F	54.1	E	43.0
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	F	45.0	D	33.6	E	39.9	F	54.1	E	43.0
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	F	45.0	D	33.6	E	39.9	F	54.1	E	43.0
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	34.5	D	34.5	E	38.5	F	43.0	E	39.8
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	34.1	D	34.1	F	37.5	F	42.3	E	39.8
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	27.1	D	27.1	E	36.6	F	-	E	39.8
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	34.0	D	34	F	40.3	F	46.2	E	39.8
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	37.2	E	37.2	F	42.3	F	48.5	D	29.1
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	27.4	D	27.4	D	32.0	F	-	C	23.5

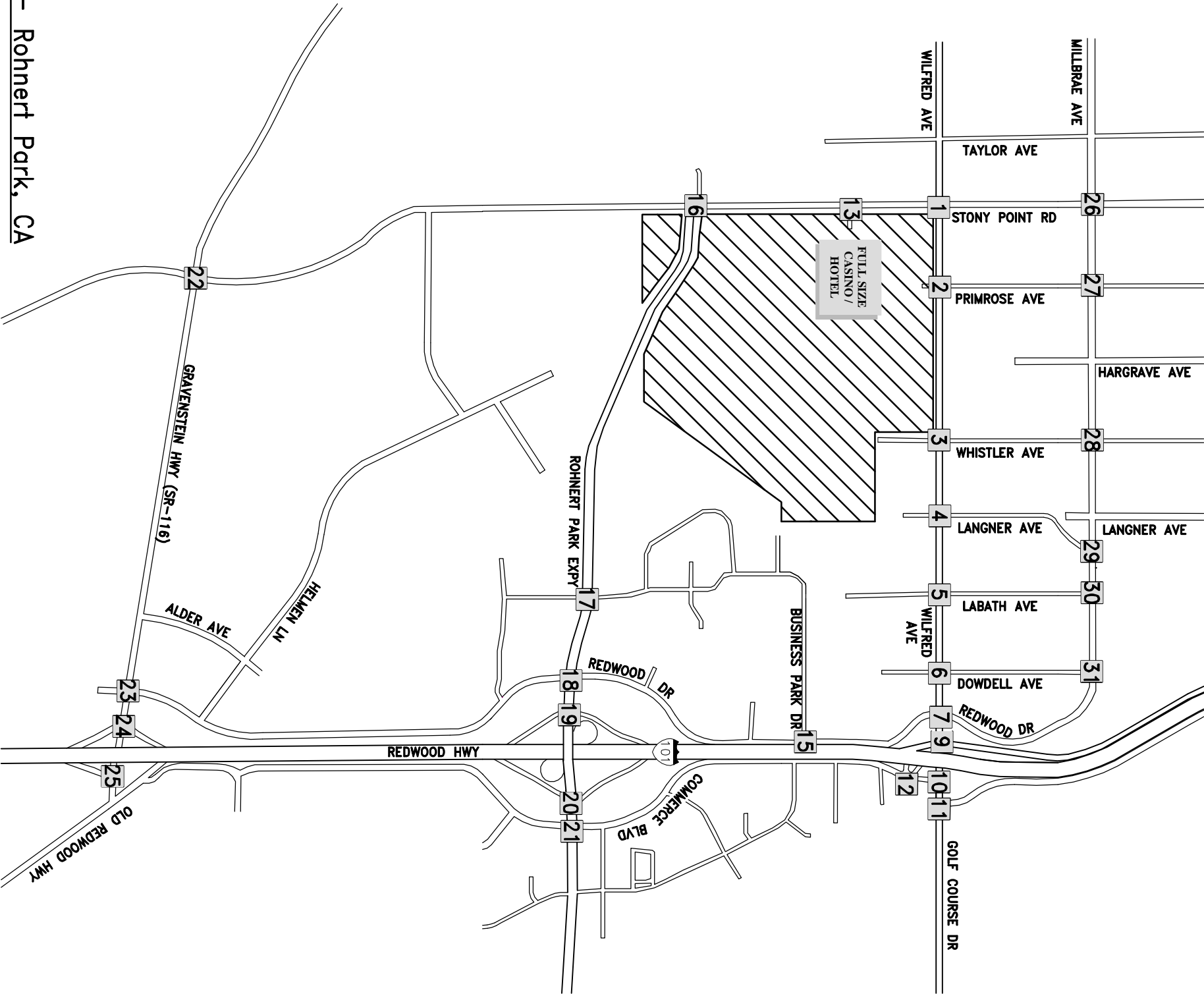
It is recommended that the casino contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating or shortening the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.

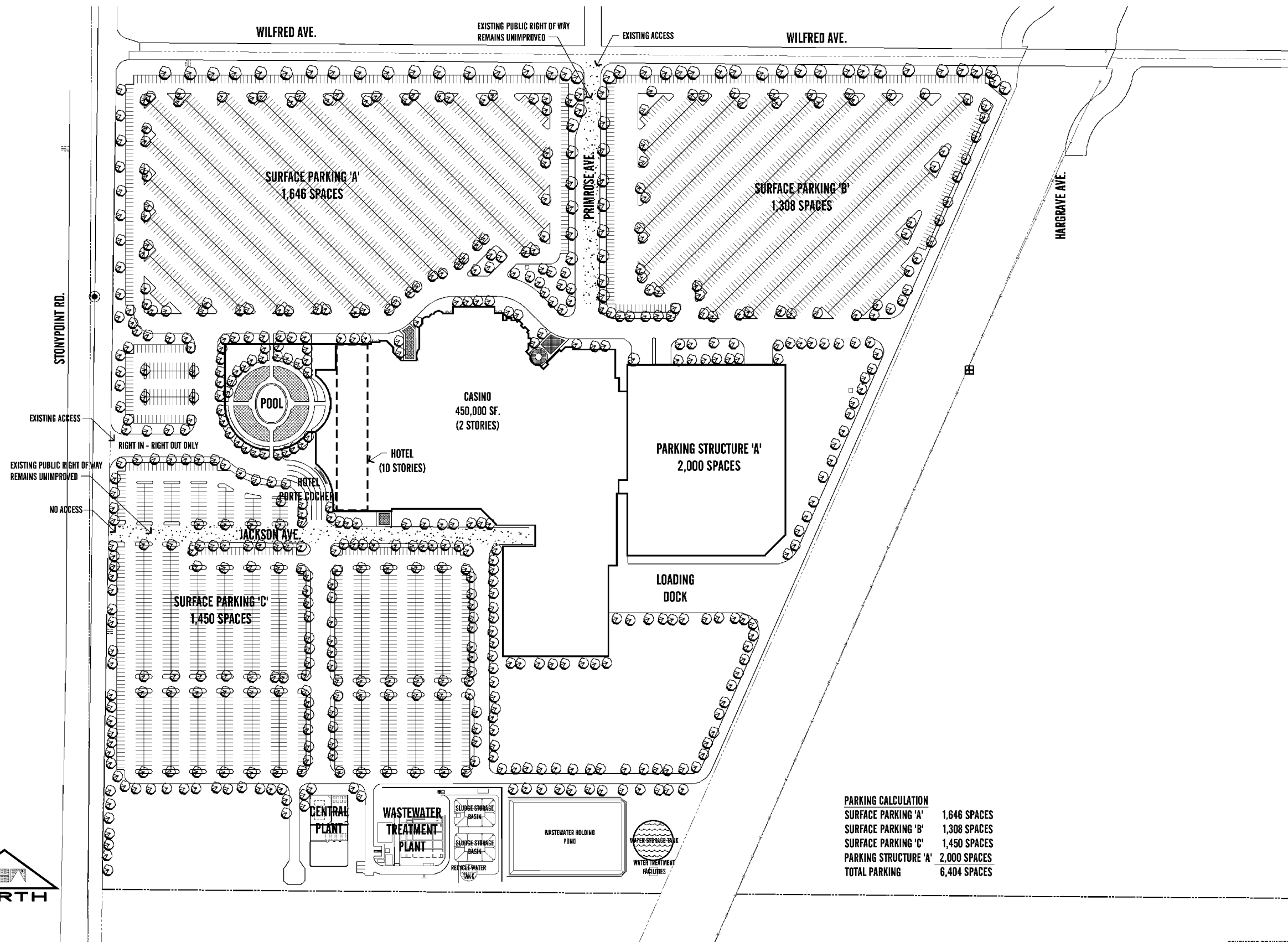


Graton Rancheria Alternative B – Rohnert Park, CA

PROJECT LOCATION

FIGURE B1





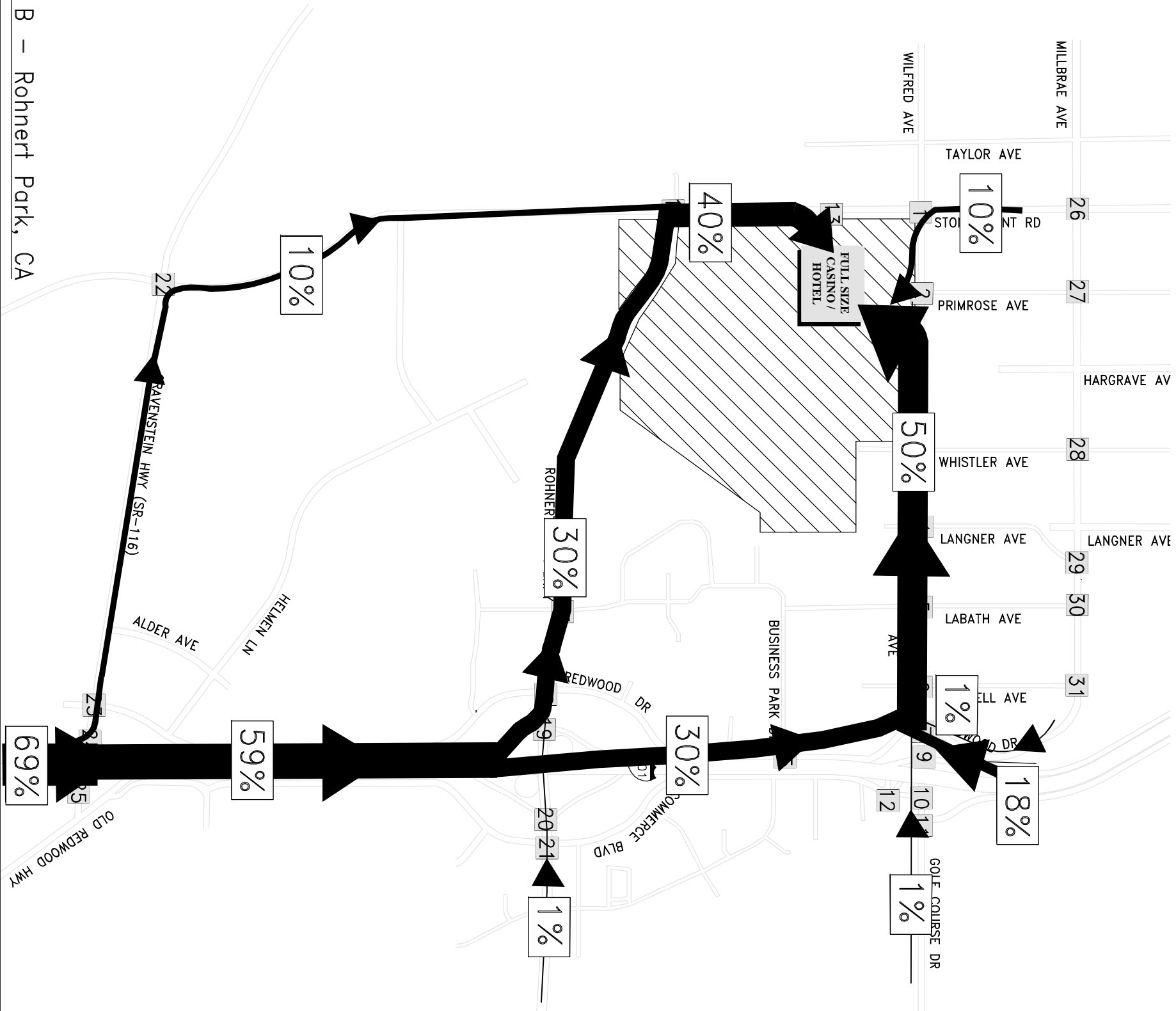
PARKING CALCULATION	
SURFACE PARKING 'A'	1,646 SPACES
SURFACE PARKING 'B'	1,308 SPACES
SURFACE PARKING 'C'	1,450 SPACES
PARKING STRUCTURE 'A'	2,000 SPACES
TOTAL PARKING	6,404 SPACES

Graton Rancheria Alternative B – Rohnert Park, CA

SITE PLAN

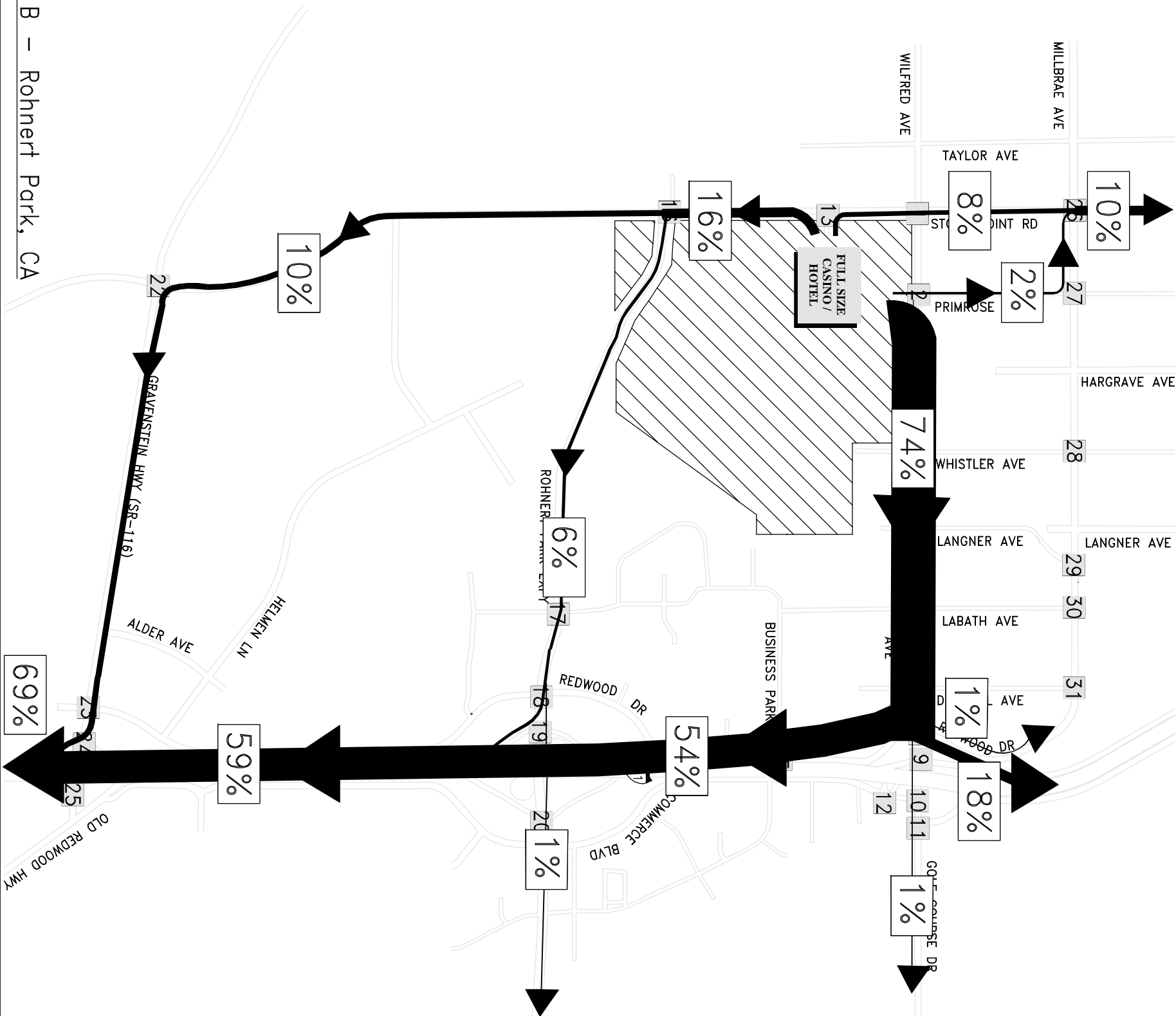
FIGURE B2





Graton Rancheria Alternative B – Rohnert Park, CA
TRIP DISTRIBUTION – IN

FIGURE B3



Graton Rancheria Alternative B – Rohner Park, CA

FIGURE B4

PROJECT GENERATED PM TRAFFIC VOLUMES

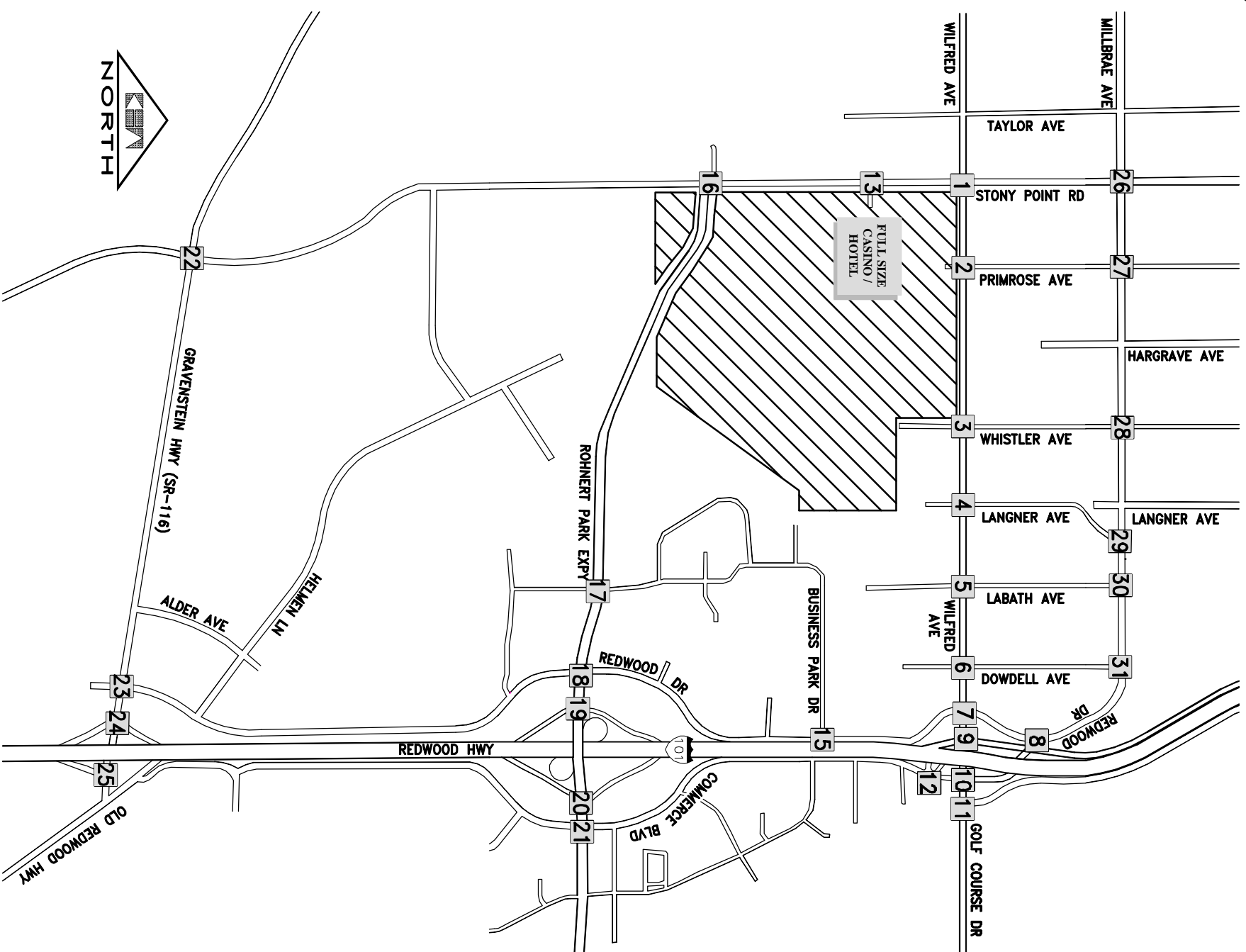
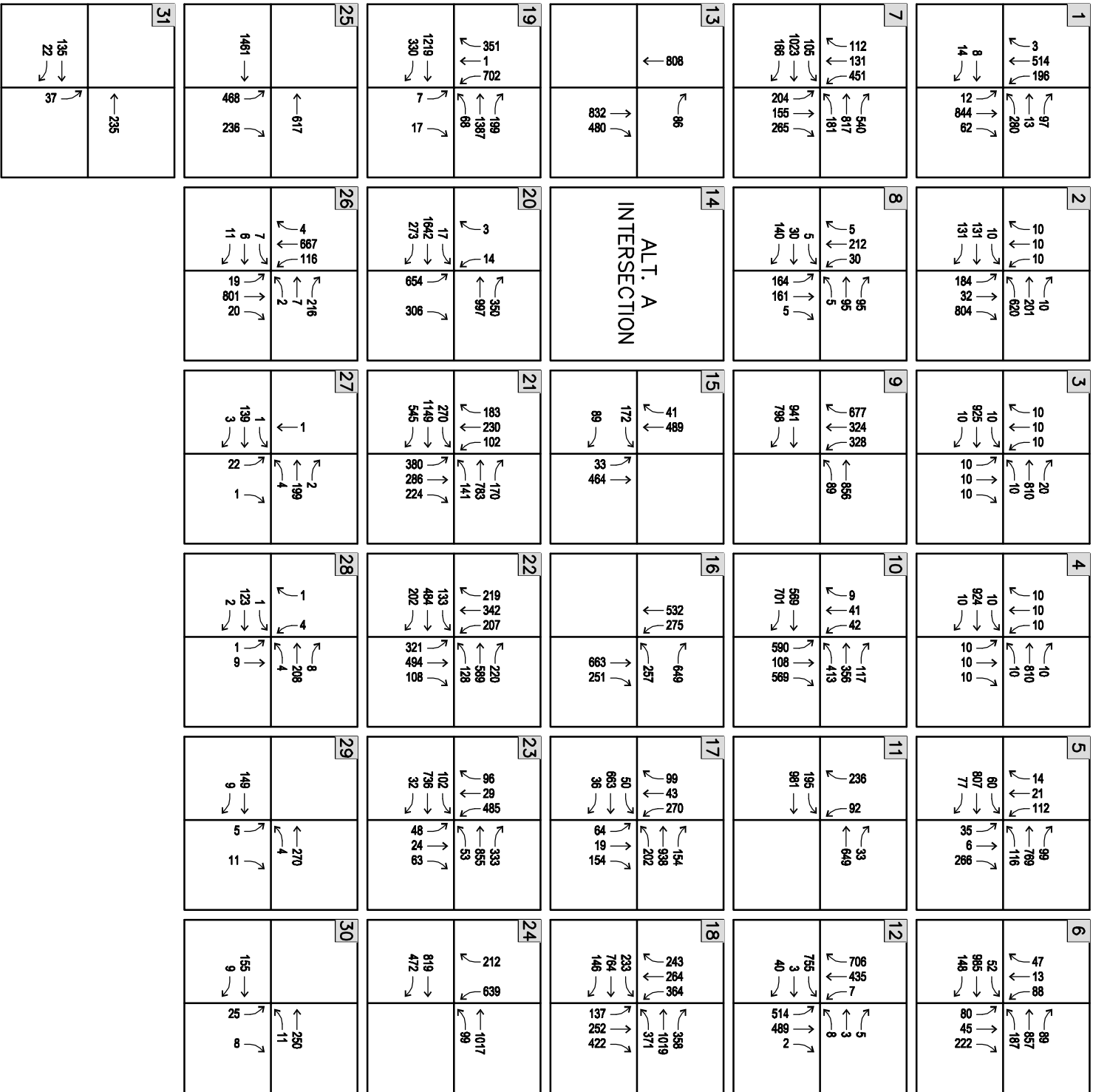
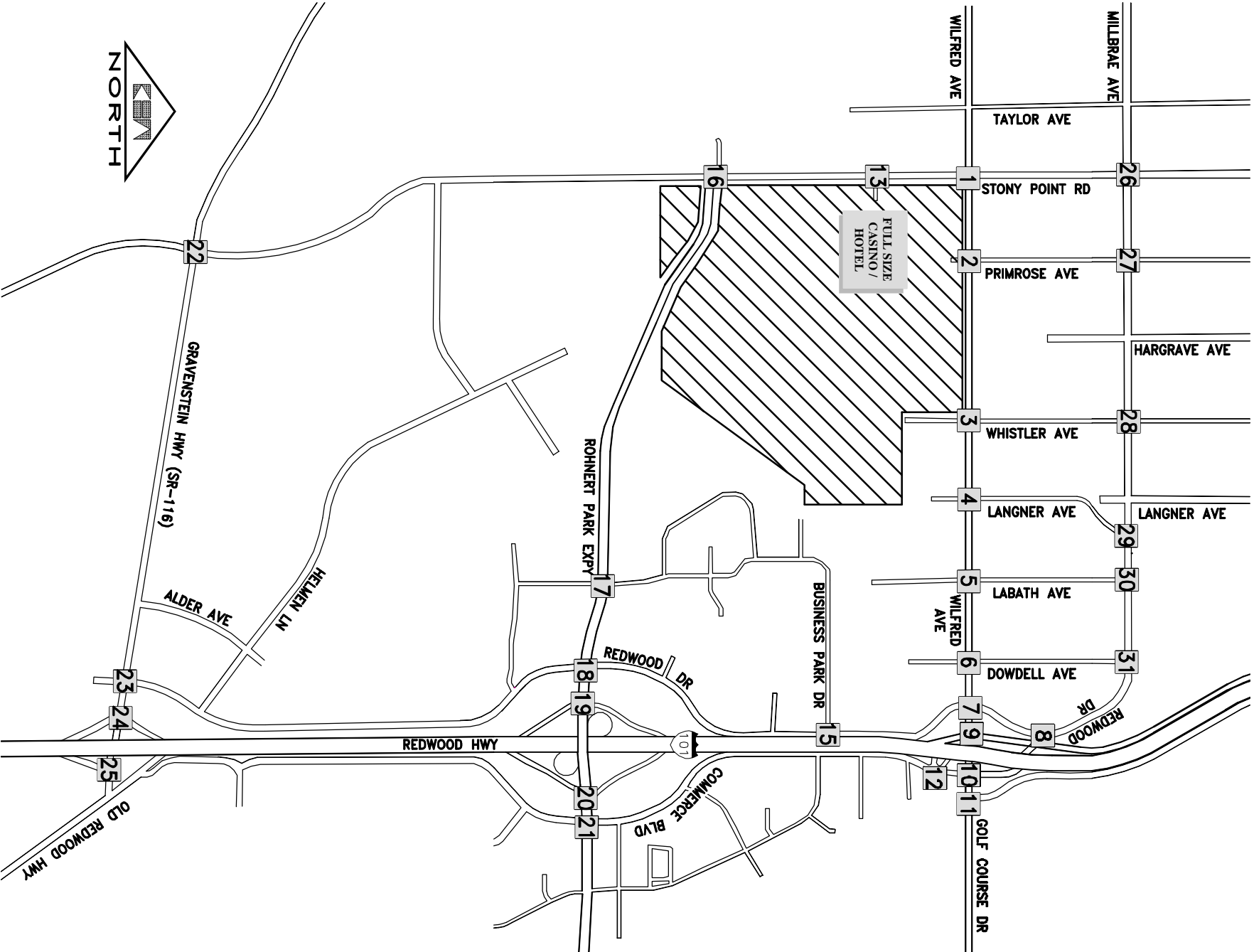
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FIGURE B5



LEGEND

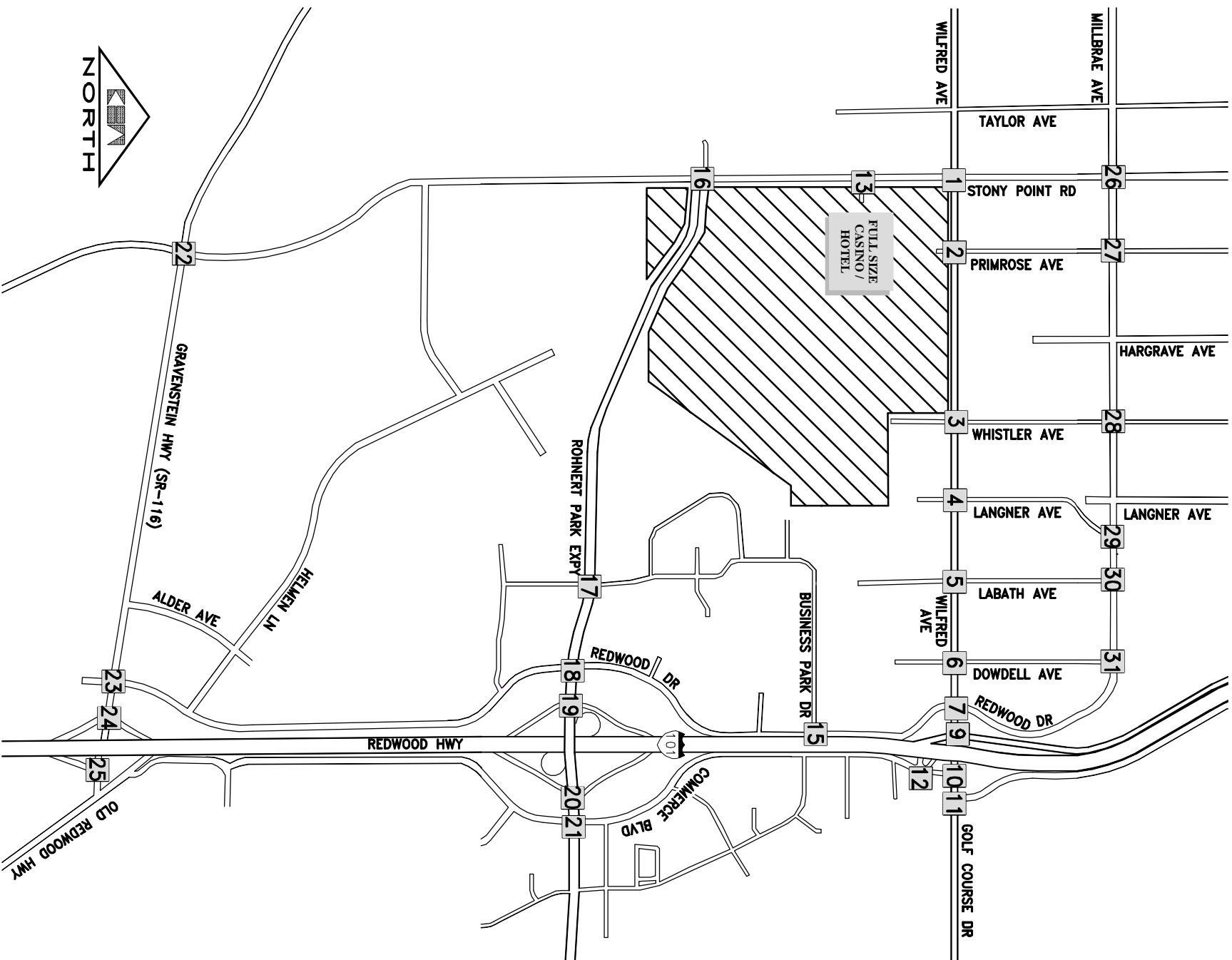
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STUDY AREA INTERSECTIONS

XX

TRAFFIC VOLUMES

FIGURE B6



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LEGEND

X

STUDY AREA INTERSECTIONS

XX

TRAFFIC VOLUMES

Graton Rancheria Alternative B – Rohnert Park, CA

FIGURE B7

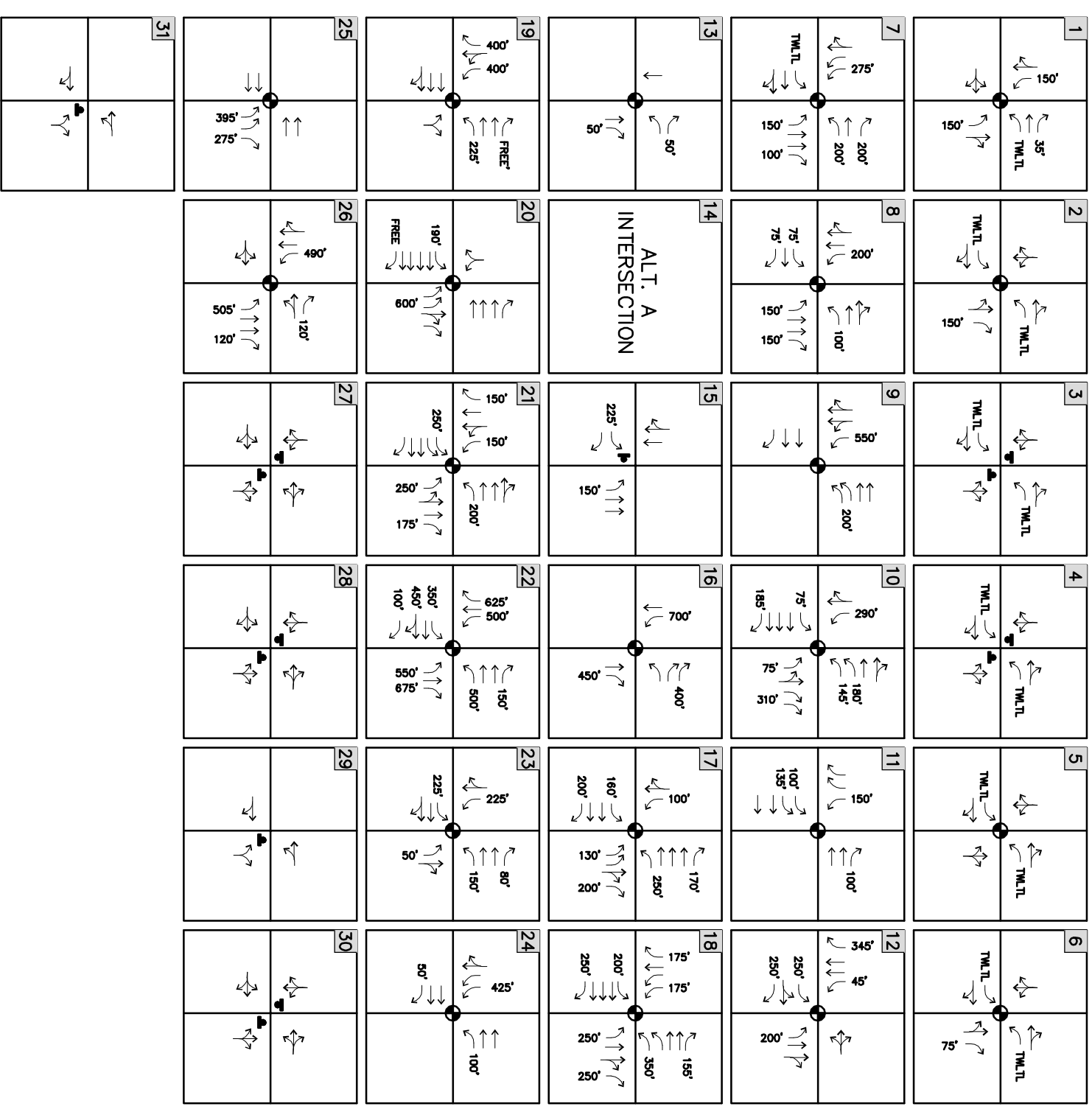
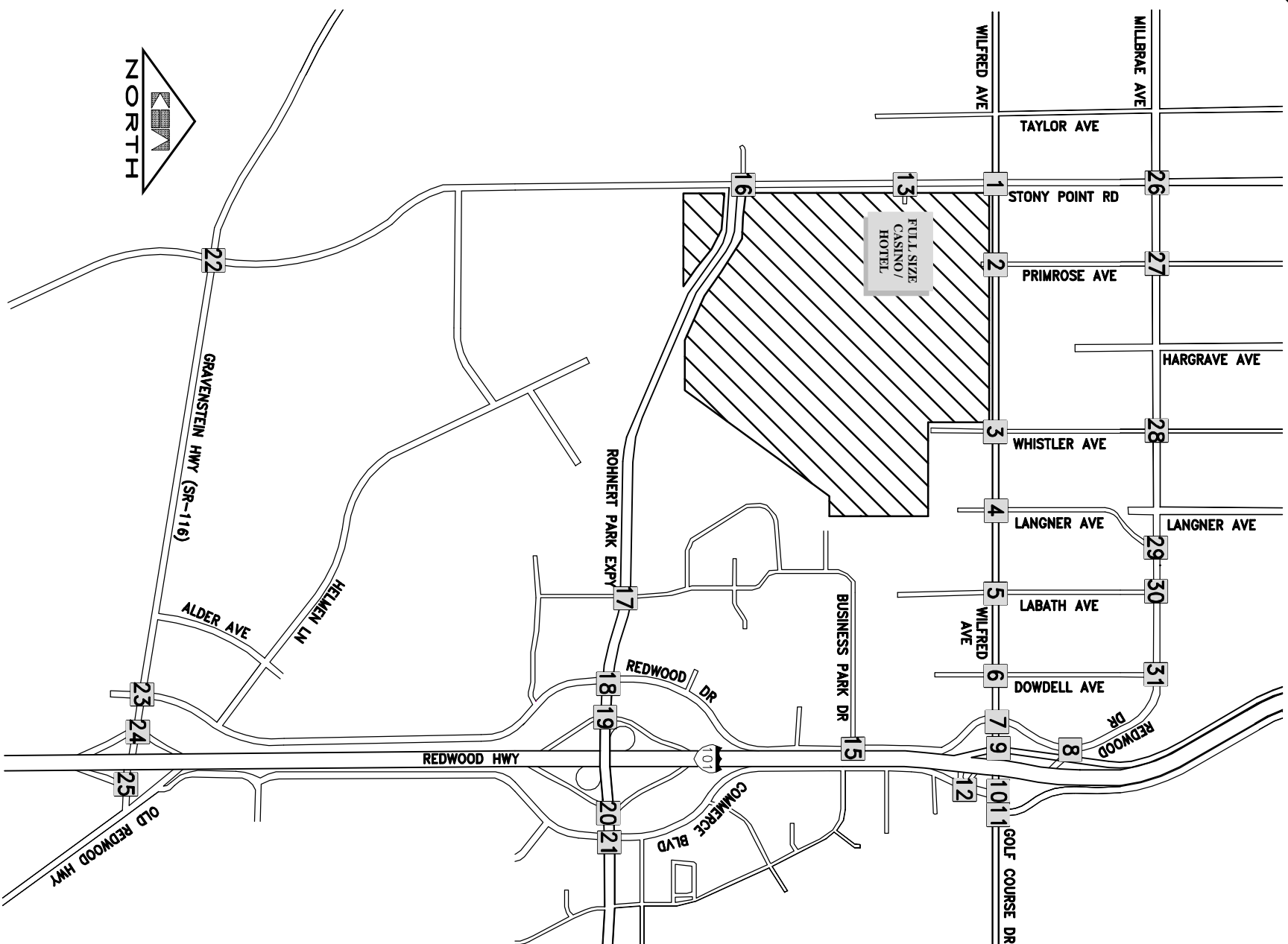
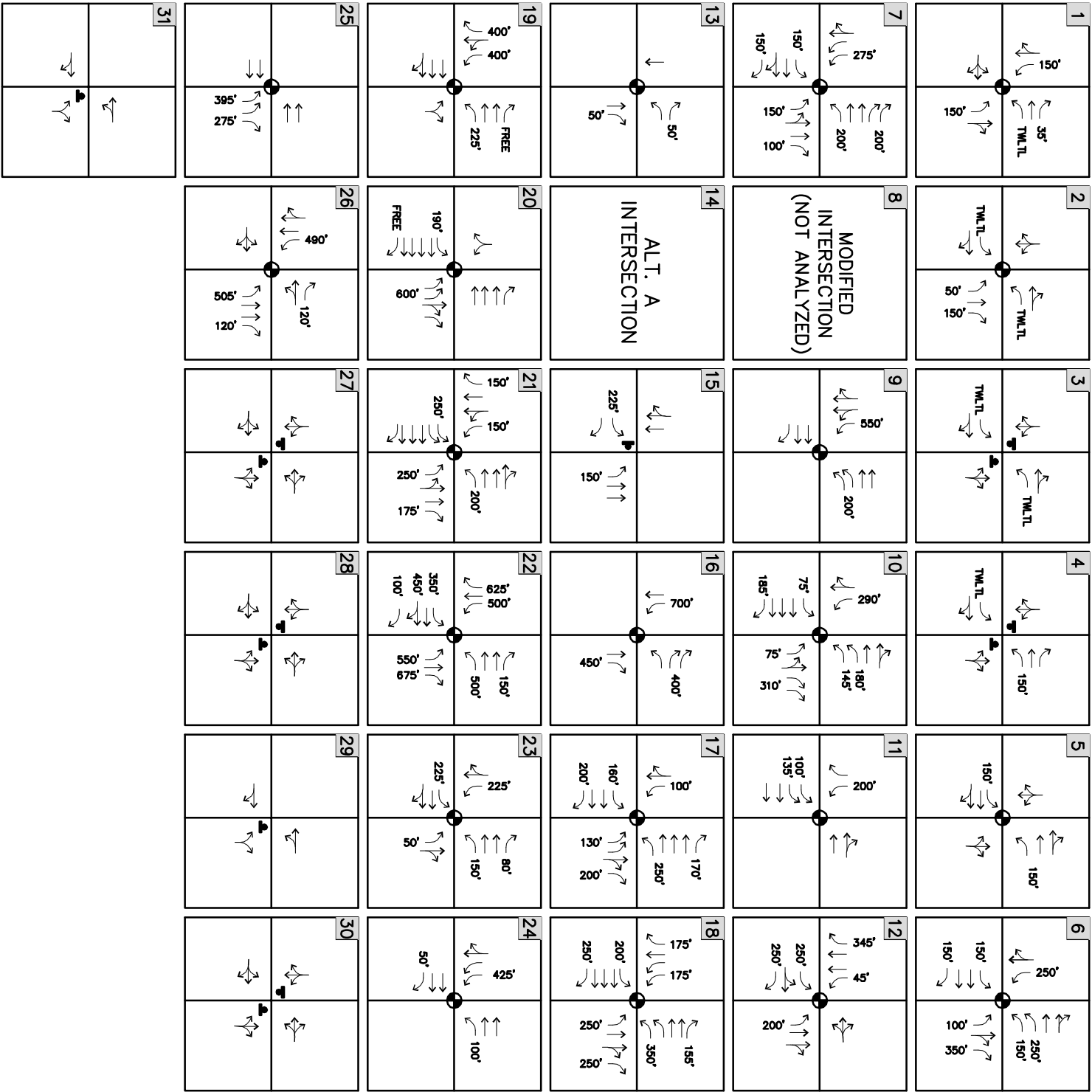
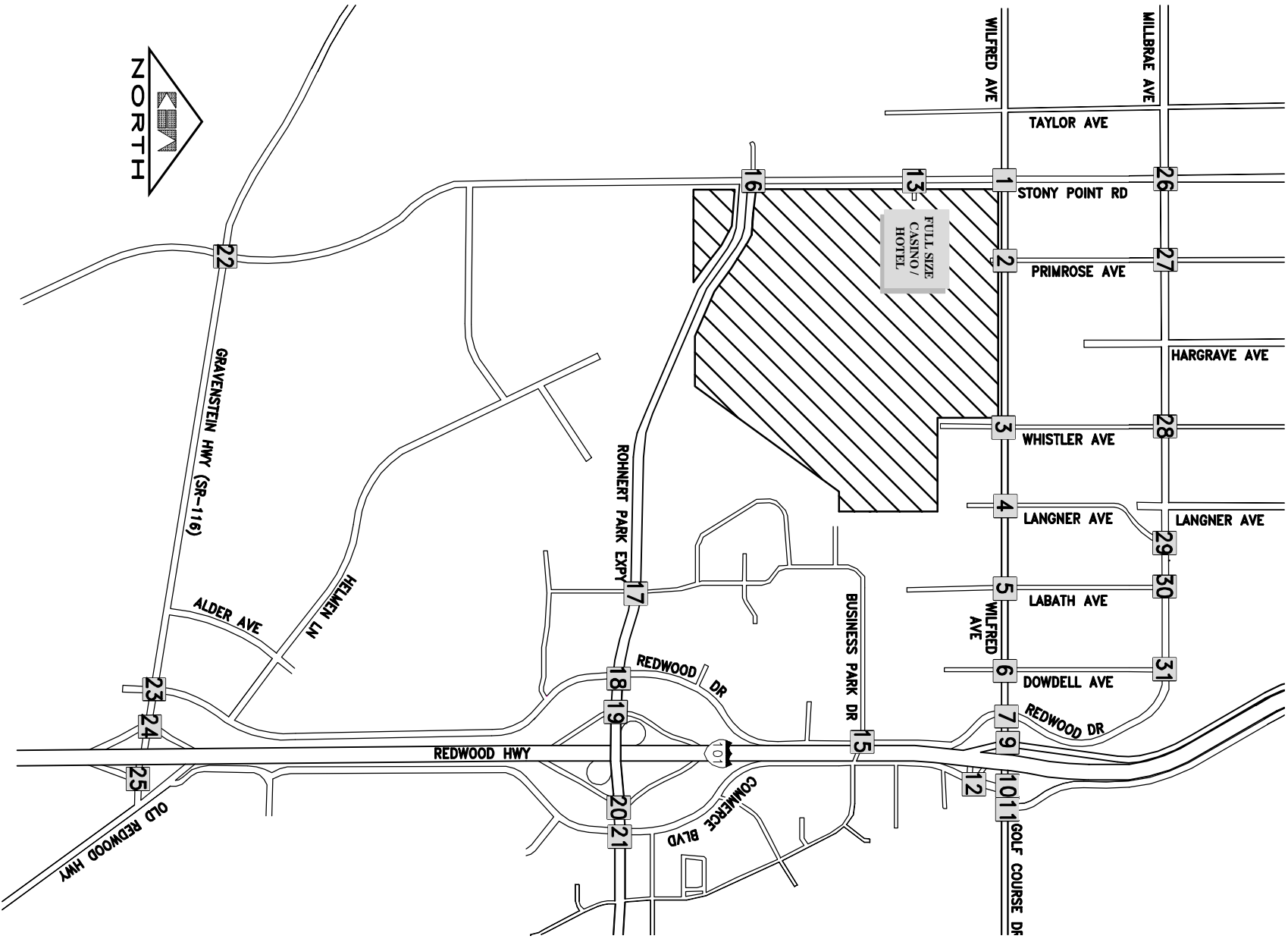


FIGURE B8

Graton Rancheria Alternative B – Rohnert Park, CA

NEAR-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL



LEGEND

- X STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- XX STORAGE LENGTH

Graton Rancheria Alternative B – Rohnert Park, CA

FIGURE B9

Kimley-Horn and Associates, Inc.

LONG-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL

ALTERNATIVE C – NORTHEAST STONY POINT SITE

The Alternative C casino and hotel is proposed to be located as shown in **Figure C1**, which is bordered by Wilfred Avenue in the north, Rohnert Park Expressway in the south, Stony Point Road in the west, and Langner Avenue in the east.

Figure C2 shows the proposed layout of the casino and hotel facility. As seen in the figure, the buildings and other related facilities are located in the northwest corner of the site. The site layout includes a main building of approximately 450,000 square feet for a casino, restaurants, food court, event center, banquet facilities, lobby, pool, and other ancillary functions. In addition the project is planned to include up to 300 hotel rooms, primarily for casino guests.

A breakdown of square footage as it relates to traffic impacts is shown below:

- Casino and Entertainment areas – 408,150 s.f.
- Lobby/Bar/Back of House/Sundries – 14,750 s.f.
- Pool and Spa – 27,100 s.f.
- 450,000 s.f.

- Hotel Rooms – 291,000 s.f.

The site plan also shows supporting uses such as parking lots, parking structure, and wastewater treatment facilities. This layout is virtually the same as Alternative A except in a different location on the project site.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Site Access

The only project access is from Wilfred Avenue from the south leg of Whistler Avenue. This approach is assumed to operate as a full movement intersection with no turn limitations. Currently, the access is unsignalized.

Trip Generation – Alternative C

Trip generation for Alternative C is identical to Alternative A. See Trip Generation – Alternatives A, B, and C section under Alternative A for specific information.

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to

destinations north of the site, with the remaining 70% distributed south of the site. To be conservative, no project traffic was assumed to be generated or attracted in the immediate vicinity of the project site. The project traffic distribution is shown in **Figure C3** and **Figure C4**. **Figure C5** illustrates project traffic assigned to the study intersections based on the assumed trip distribution. As seen in **Figure C5**, most of the project traffic is expected to come from the freeway therefore it was assumed that most of the traffic would use Whistler Avenue because of its closer proximity to the freeway. As noted in the distribution, some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the Alternative C casino and hotel project. **Figure C6** illustrates the combined near-term turning movement volumes at the study intersections.

Cumulative Long -Term Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the Alternative C casino and hotel project. **Figure C7** illustrates the combined long-term turning movement volumes at the study intersections.

Alternative C LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions:

- Near-term conditions with Alternative C (year 2008)
- Long-term Cumulative conditions with Alternative C (year 2020)

In the near-term analysis for Alternative C, it was assumed that the Wilfred Avenue widening project will not have taken place before the casino/hotel opens. The Memorandum of Understanding (MOU) between the City of Rohnert Park and the Federated Indians of the Graton Rancheria stated that the tribe would help financially to speed up the timeline of the widening project to occur before the casino/hotel opens in 2008.

Results of the analysis are presented in **Table C1**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the Appendix. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

Table C 1 – Alternative C Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	F	841.3	F	OVRFL
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	C	24.7	B	12.5	D	29.3
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	OVRFL	B	12.5	F	OVRFL
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	F	132.1	B	12.5	F	192.1
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	334.5	F	169.9	F	311.0
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	24.9	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	33.8	C	26.8	D	36.5
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	116.7	E	74.2	F	154.4
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.5	B	19.0	B	19.3
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	F	83.8	D	50.8	F	153.7
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	D	39.8	B	18.5	D	37.6
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	29.6	C	28.2	C	31.6
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	24.9	C	29.1	C	28.0
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.5	B	16.0	B	15.7
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	13.6	B	12.3	B	15.1
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	43.0	E	63.4	E	61.9
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	43.0	D	45.5	D	51.6
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	28.3	D	42.4	E	63.3
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.3	B	18.1	B	18.6
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	12.1	B	11.5	B	12.6
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	69.6	F	90.2	F	207.1
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.7	B	12.4	B	12.6
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.6	B	12.5	B	12.7
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.7	B	11.7

2008 Results

- Stony Point Road/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

2020 Results

- Stony Point Road/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Commerce Boulevard
- Gravenstein Highway (SR-116)/Redwood Drive
- Millbrae Avenue/Stony Point Road

Alternative C Traffic Signal Warrant Analysis

Alternative C, near-term and long-term, traffic volumes at unsignalized study intersections were compared against the peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersections will satisfy traffic signal Warrant #3 by the year 2008 and 2020.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Whistler Avenue/Wilfred Avenue (2008 and 2020)
- Labath Avenue/Wilfred Avenue (2008 and 2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated

based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Alternative C LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed Alternative C casino and hotel were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the casino and hotel project. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table C2**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project.

Table C 2 – Alternative C Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt C		2020		2020 + Alt C	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	25.1	C	25.6	E	38.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	31.8	D	34.1	F	41.8
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	33.4	E	36.1	F	43.1
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	28.8	D	32.3	F	-
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	32.5	E	37.1	F	43.7
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	D	31.4	C	23.2	F	41.8
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	30.4	D	29.0	E	38.6
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	30.4	D	29.0	E	38.6
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	30.4	D	29.0	E	38.6
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.9	E	40.4	F	44.3
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.9	E	40.4	F	44.3
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.9	E	40.4	F	44.3
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.8	D	29.7	D	32.6
Southbound											
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	26.1	D	28.5	D	31.2
Santa Rosa Avenue SB On-Ramp	E	D	31.2								
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	36.2	F	-	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.8	F	44.8	F	46.8
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	F	46.6	E	39.9	F	50.7
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	F	46.6	E	39.9	F	50.7
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	F	46.6	E	39.9	F	50.7
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.4	E	38.5	F	43.4
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	32.8	F	37.5	F	43.3
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	27.1	E	36.6	F	-
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	32.5	F	40.3	F	46.2
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	35.7	F	42.3	F	48.4
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	27.4	D	32.0	F	-

Potential Effects on Intersection Safety

Traffic volumes generated by the project were reviewed in consideration of existing intersection collision history and the potential for increased accidents. According to collision data, accidents involving bicyclist and pedestrians are very low. Many intersections did not report any collisions of this type during the survey period. This suggests that bicycle and pedestrian volumes are relatively low and study intersections have minimal safety hazards for individuals biking or walking. Although the project will introduce increased traffic volumes at some intersections, bicyclists and pedestrians are expected to be able to travel through study intersections with similar levels of safety. Historically casinos do not attract a significant amount of bicycle and pedestrian traffic. . Therefore, the expected amount of pedestrian and bicycle traffic is nominal and a significant increase in bicycle and pedestrian accidents is unlikely.

The potential for increased collisions between motorized vehicles was also considered. Collision frequency and severity are a function of many complex factors that vary depending on the location and type of intersection or roadway segment. Factors include traffic control such as signals or stop signs, lane and shoulder widths, grades, driveway densities, roadside hazards or obstacles, presence of left and right turn lanes, sight distance, congestion, and others.

Because of the number and interrelationships of the variables, accurate crash prediction is difficult. However, the proposed casino and hotel project will increase roadway congestion, a factor which could result in an increase in traffic collisions if left unmitigated. Other factors are expected to remain unaffected.

As noted previously, the purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development. This includes mitigation improvements to restore traffic operations to levels within acceptable standards or to levels as good as or better than without the casino/hotel project. Any potential increases in accidents due to project-related traffic would be offset by the implementation of roadway improvements included as mitigation. Therefore, if mitigations are implemented as proposed in this report, no significant increase in daytime or nighttime collisions is expected.

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table C3**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.



Table C 3 – Alternative C Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length		Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020				2008	2020
1 Stony Point Road and Wilfred Avenue	EBL				16 Stony Point Road and Rohnert Park Expy	EBL			
	EBR					EBR			
	WBL					WBL			
	WBR	35	OVFL	OVFL		WBR	175	104	59
	NBL	150	25	25		NBL			
	NBR					NBR	450	38	38
4 Langner Avenue and Wilfred Avenue	SBL	150	37	40		SBL	700	329	320
	SBR					SBR			
	EBL				17 Labath Avenue and Rohnert Park Expy	EBL	160	61	111
	EBR					EBR	200	25	29
	WBL	150		25		WBL	250	90	38
	WBR					WBR	170	25	25
	NBL					NBL	130	36	38
	NBR					NBR	130	36	37
5 Labath Avenue and Wilfred Avenue	SBL					SBL	100	193	202
	SBR					SBR			
	EBL	150		25	18 Redwood Drive and Rohnert Park Expy	EBL	200	107	98
	EBR					EBR	200	25	25
	WBL	150		28		WBL	350	159	157
	WBR					WBR	155	28	27
	NBL					NBL	250	157	210
	NBR					NBR	250	65	108
6 Dowdell Avenue and Wilfred Avenue	SBL					SBL	175	188	172
	SBR					SBR	175	58	57
	EBL	150		25	19 SB US 101 Ramps and Rohnert Park Expy	EBL			
	EBR					EBR			
	WBL	150		483		WBL	225	70	67
	WBR					WBR			
	NBL					NBL			
	NBR					NBR			
7 Redwood Drive and Wilfred Avenue	SBL					SBL	400	318	238
	SBR					SBR	400	217	268
	EBL	150		203	20 NB US 101 Ramps and Rohnert Park Expy	EBL	190	25	25
	EBR	150		302		EBR			
	WBL					WBL			
	WBR					WBR			
	NBL	150	402	1271		NBL	225	247	279
	NBR	100	95	110		NBR			
8 Redwood Drive and Commerce Boulevard	SBL	275	350	350	21 Commerce Blvd and Rohnert Park Expy	SBL			
	SBR					SBR			
	EBL	75	25			EBL	250	69	58
	EBR	75	50			EBR			
	WBL	100	25			WBL	200	187	222
	WBR					WBR	250	210	214
9 Wilfred Avenue and SB US 101 Ramps	NBL	150	136			NBL	175	56	58
	NBR	150	25			NBR	150	98	158
	SBL	200	40			SBL	150	51	47
	SBR					SBR	350	162	183
	EBL				22 Stony Point Road and Gravenstein Hwy	EBL			
	EBR					EBR			
10 Golf Course Drive and Commerce Blvd	WBL	300	25	25		WBL	500	155	170
	WBR					WBR	150	50	51
	NBL					NBL	550	296	298
	NBR					NBR	675	30	31
	SBL	250	229	251		SBL	500	234	247
	SBR					SBR	625	49	54
11 Roberts Lake Drive and Golf Course Drive	EBL				23 Redwood Road and Gravenstein Hwy	EBL	225	161	194
	EBR					EBR			
	WBL	150	789	1000		WBL	150	56	54
	WBR					WBR	80	25	261
	NBL	150	1131	1194		NBL	50	65	65
	NBR					NBR			
12 Commerce Blvd and NB US 101 Ramps	SBL	200	94	30		SBL	225	388	556
	SBR					SBR			
	EBL	80	102	54	24 Gravenstein Hwy and SB US 101 Ramps	EBL			
	EBR					EBR	50	110	122
	WBL					WBL	100	101	72
	WBR					WBR			
	NBL					NBL			
	NBR					NBR			
15 Business Park Drive and Redwood Drive	SBL	200	76	83		SBL	425	222	222
	SBR				25 Gravenstein Hwy and NB US 101 Ramps	SBR			
	EBL	250	523	580		EBL			
	EBR	250	25	25		EBR			
	WBL					WBL			
	WBR					WBR			
15 Business Park Drive and Redwood Drive	NBL	200	478	524		NBL	395	162	162
	NBR					NBR	275	176	201
	SBL	100	25	25	26 Stony Point Road and Millbrae Avenue	SBL			
	SBR	175	217	256		SBR			
	EBL	225	95	40		EBL			
	EBR					EBR			
	WBL					WBL			
	WBR					WBR	120	49	195
15 Business Park Drive and Redwood Drive	NBL	150	25	25		NBL	505	25	25
	NBR					NBR	120	25	25
	SBL					SBL	490	25	25
	SBR					SBR			

Alternative C Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Alternative C traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown in **Table C4** are needed in the near-term (2008) and long-term (2020).

Table C5 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections.

Figures C8 and C9 illustrate the mitigated lane geometry and traffic control.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue.

The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to the Urban Growth Boundary. From Langner Avenue west to Stony Point Road, Wilfred Avenue should be three lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and should include Class II bike lanes out to Stony Point Road to connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Stony Point Road, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

The project will create a significant unavoidable impact at the intersection of Golf Course Drive/Commerce Boulevard.



Table C 4 – Alternative C Summary of Mitigations

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	1	Stony Point Rd/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Add NB right and change through-right to through 	No Tribe land	Capacity Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Add EB right and change EB all shared to left-through Add a NB right and change all shared to left-through Add 2 WB lefts and change all shared to through-right 	No Tribe land Tribe land Yes	Capacity Capacity Capacity Capacity
	4	Langer Ave/ Wilfred Ave	<ul style="list-style-type: none"> Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ 	Yes	Capacity
	5	Labath Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ Add NB right and change NB all shared to left-through 	No Yes Yes	Capacity Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Widen Wilfred to 3 lanes (Add EB left & WB left) ¹ Add an EB right turn lane and change all shared to through Add WB through 	No Yes Yes Yes	Capacity Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	<ul style="list-style-type: none"> Add WB through Change WB left-through to through Add EB through Add EB left and EB right and change EB all-shared to through Change phasing east-west to protected from split 	Yes No Yes Yes No	Capacity Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	No mitigation necessary	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	<ul style="list-style-type: none"> Add an EB right turn overlap phase Significant Unavoidable Impact 	Yes	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	<ul style="list-style-type: none"> Add a SB right turn overlap phase 	No	Capacity
	13	Project Driveway/ Stony Point Rd	No mitigation necessary	-	-
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	No mitigation necessary	-	-
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	<ul style="list-style-type: none"> Extend NB left turn bay to 275 feet (from 225 feet) Add second NB left turn lane 	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	<ul style="list-style-type: none"> Optimize signal timing Add an EB right overlap phase 	No No	Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	<ul style="list-style-type: none"> Signalize 	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

¹ In summary, widen Wilfred Ave to three lanes from Stony Point Rd to Redwood Dr



Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	1	Stony Point Rd/ Wilfred Ave	<ul style="list-style-type: none"> • Signalize * • Add WB left and change WB left-through to through • Add NB right and change through-right to through * • Extend WB right turn bay to 75 feet (from 35 feet) • Optimize signal timing 	No Yes Tribe land Yes No	Capacity Capacity Capacity Queue Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	<ul style="list-style-type: none"> • Signalize * • Add EB right and change EB all shared to left-through * • Add a NB right and change all shared to left-through * • Add 2 WB lefts and change all shared to through-right * 	No Tribe land Tribe land Yes	Capacity Capacity Capacity Capacity
	4	Langer Ave/ Wilfred Ave	• Add EB left *	Yes	Capacity
	5	Labath Ave/ Wilfred Ave	<ul style="list-style-type: none"> • Signalize * • Add NB right and change NB all shared to left-through * • Optimize signal timing • Add a SB left and change SB all shared to through-right 	No Yes No Yes	Capacity Capacity Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	<ul style="list-style-type: none"> • Signalize * • Add an EB right turn lane and change through-right to through * • Optimize signal timing • Add a second WB left turn • Add a NB right overlap phase • Add 1 SB left turn bay and 1 SB right turn bay and change all shared to through • Add 1 NB left turn bay and 1 NB right turn bay and change all shared to through-right 	No Yes No Yes No Yes Yes	Capacity Capacity Capacity Capacity Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	<ul style="list-style-type: none"> • Add WB through * • Optimize signal timing • Change NB through to left-through & change north-south phasing to split from protected • Change WB left-through to through * • Change phasing east-west to protected from split * 	Yes No No Yes No	Capacity Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	Modified Intersection (not analyzed)	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	<ul style="list-style-type: none"> • Add an exclusive EB right turn overlap phase * • Add a second exclusive EB right turn lane • Significant Unavoidable Impact 	Yes Yes	Capacity Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	<ul style="list-style-type: none"> • Add a SB right turn overlap phase * • Add a second SB right turn lane. Will require a two lane on-ramp with one lane as an auxiliary lane between the Wilfred Avenue and Santa Rosa Avenue interchanges. May require additional bridge structure widening over Wilfred Avenue as well as over the Northwest Pacific Railroad tracks. • Optimize signal timing 	No Yes No	Capacity Queue Capacity
	13	Project Driveway/ Stony Point Rd	No mitigation necessary	-	-
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	No mitigation necessary	-	-
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	<ul style="list-style-type: none"> • Extend NB left turn bay to 275 feet (from 225 feet) * • Add second NB left turn lane * 	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	<ul style="list-style-type: none"> • Optimize signal timing * • Add a third EB through lane that merges back into 2 lanes east of the intersection 	No Yes	Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	<ul style="list-style-type: none"> • Add a WB right overlap phase • Optimize signal timing 	No No	Queue Capacity
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize *	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

* Improvement assumed to occur with 2008 mitigation



Table C 5 – Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020							
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	D	37.2	F	841.3	F	OVRFL	D	39.8
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	C	24.7	C	24.7	B	12.5	D	29.3	D	29.3
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	OVRFL	C	25.7	B	12.5	F	OVRFL	C	26.3
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	F	136.3	F	OVRFL	B	12.5	F	192.1	F	OVRFL
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	D	38.8	F	OVRFL	F	OVRFL	C	27.3
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	D	47.5	F	OVRFL	F	OVRFL	D	35.5
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	334.5	D	54.8	F	169.9	F	311.0	D	41.9
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	24.9	C	25.3	-	-	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	33.8	C	30.3	C	26.8	D	36.5	C	26.5
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	116.7	E	67.9	E	74.2	F	154.4	E	63.6
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.5	B	18.5	B	19.0	B	19.3	B	18.2
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	F	83.8	D	40.9	D	50.8	F	153.7	D	50.3
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	D	27.5	C	16.7	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	D	39.8	D	39.8	B	18.5	D	37.6	D	37.6
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	29.6	C	29.6	C	28.2	C	31.6	C	31.6
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	24.9	C	25.2	C	29.1	C	28.0	C	28.3
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.5	B	18.5	B	16.0	B	15.7	B	15.9
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	13.6	B	10.6	B	12.3	B	15.1	B	11.5
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	43.0	C	30.9	E	63.4	E	61.9	C	32.6
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	43.0	D	43.0	D	45.5	D	51.6	D	51.6
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	28.3	C	28.3	D	42.4	E	63.3	D	38.0
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.3	B	19.3	B	18.1	B	18.6	C	24.4
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	12.1	B	12.1	B	11.5	B	12.6	B	12.6
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	69.6	A	10.0	F	90.2	F	207.1	B	10.4
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.7	B	11.7	B	12.4	B	12.6	B	12.6
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.6	B	11.6	B	12.5	B	12.7	B	12.7
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	A	9.9	B	11.3	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	11.7	B	14.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.4	B	11.7	B	11.7	B	11.7

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table C6**:

- Adjust the ramp metering to account for the additional project traffic at the Wilfred Avenue interchange in the near-term (2008). Most metering adjustments can be minor and are not expected to have queuing effects on the local street network. However, the southbound on-ramp will require heavy metering to obtain an acceptable level of service for the freeway ramp merge area which may create a long queue backed up on the ramp.
- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Wilfred Avenue and from Gravenstein Highway (SR-116) to West Sierra Avenue as well as an additional traffic lane in the northbound direction from West Sierra Avenue to Gravenstein Highway (SR-116) in the long-term (2020).

Aside from roadway improvements to mitigate protect impacts, the casino and hotel should coordinate with the Green Music Center during outdoor events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park interchange may be necessary. Therefore, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur, the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control.

Because no fixed route service will be available at the project site, the casino/hotel should provide a shuttle that serves the two Rohnert Park transfer stations. The shuttle should run throughout the day or could be called out on demand.

The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

Table C 6 – Alternative C Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria		Existing		2008		2008 + Alt C		2008 + Alt C Mitigated		2020		2020 + Alt C		2020 + Alt C Mitigated	
	LOS	LOS	Density (pc/mi/ln)	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound																
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	25.1	C	25.1	C	25.6	E	38.4	E	38.4	
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	31.8	D	31.8	D	34.1	F	41.8	D	29.3	
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	33.4	D	33.4	E	36.1	F	43.1	E	39.3	
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	28.8	D	28.8	D	32.3	F	-	E	39.3	
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	32.5	D	32.5	E	37.1	F	43.7	E	39.3	
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	D	31.4	D	31.4	C	23.2	F	41.8	E	38.6	
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	D	30.4	D	30.4	D	29.0	E	38.6	E	38.6	
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	D	30.4	D	30.4	D	29.0	E	38.6	E	38.6	
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	D	30.4	D	30.4	D	29.0	E	38.6	E	38.6	
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.9	D	33.9	E	40.4	F	44.3	E	43.0	
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.9	D	33.9	E	40.4	F	44.3	E	43.0	
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.9	D	33.9	E	40.4	F	44.3	E	43.0	
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.8	C	23.8	D	29.7	D	32.6	D	32.6	
Southbound																
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	D	26.1	D	26.1	D	28.5	D	31.2	D	31.2	
Santa Rosa Avenue SB On-Ramp	E	D	31.2													
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	36.2	E	36.2	F	-	F	-	C	24.8	
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.8	E	40.8	F	44.8	F	46.8	D	32.7	
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	F	46.6	E	52.2	E	39.9	F	50.7	E	43.0	
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	F	46.6	E	52.2	E	39.9	F	50.7	E	43.0	
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	F	46.6	E	52.2	E	39.9	F	50.7	E	43.0	
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.4	D	33.4	E	38.5	F	43.4	E	40.7	
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	32.8	D	32.8	F	37.5	F	43.3	E	40.7	
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	27.1	D	27.1	E	36.6	F	-	E	40.7	
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	32.5	D	32.5	F	40.3	F	46.2	E	40.7	
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	35.7	E	35.7	F	42.3	F	48.4	D	29.1	
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	27.4	D	27.4	D	32.0	F	-	C	23.5	

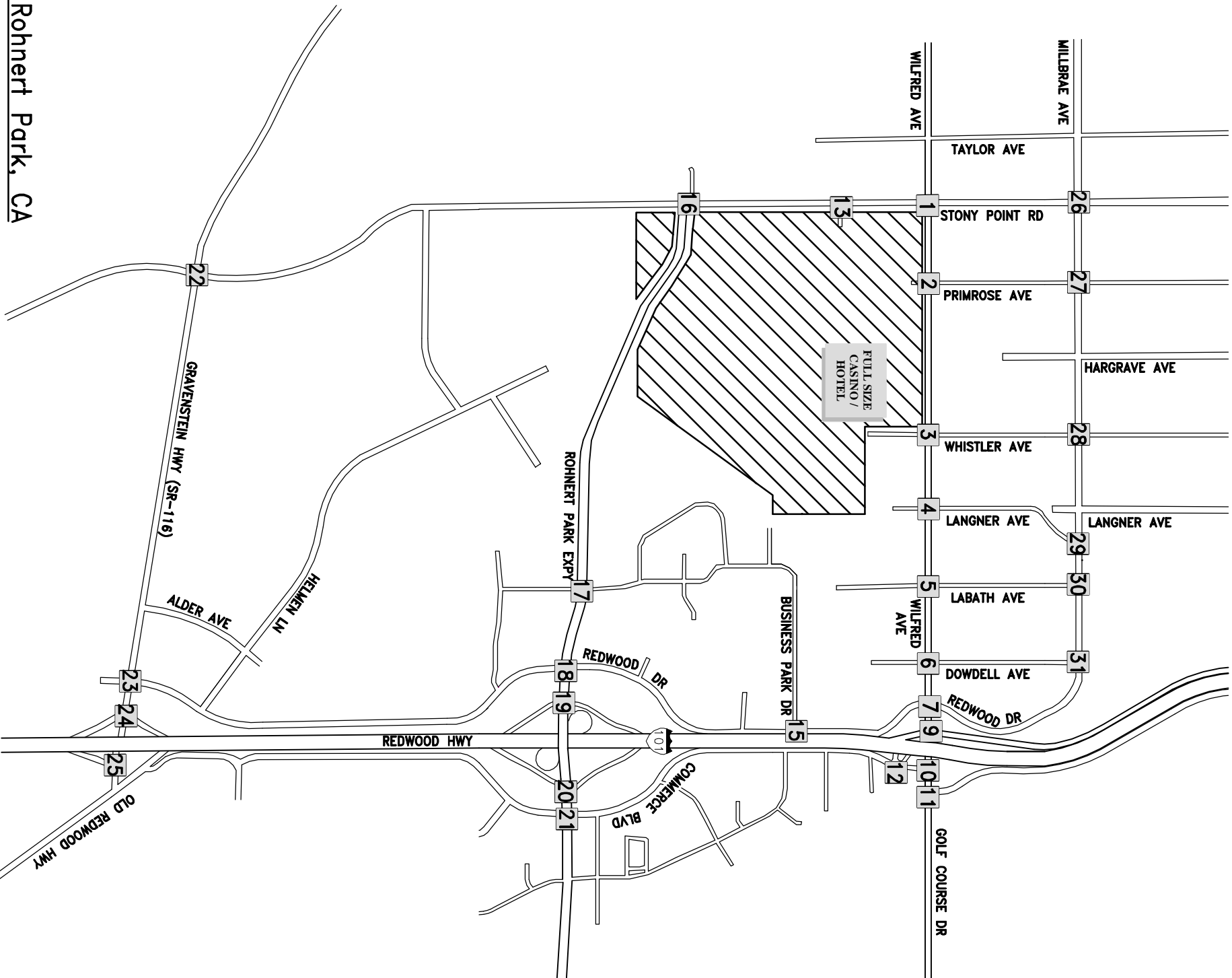
It is recommended that the casino contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating or shortening the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

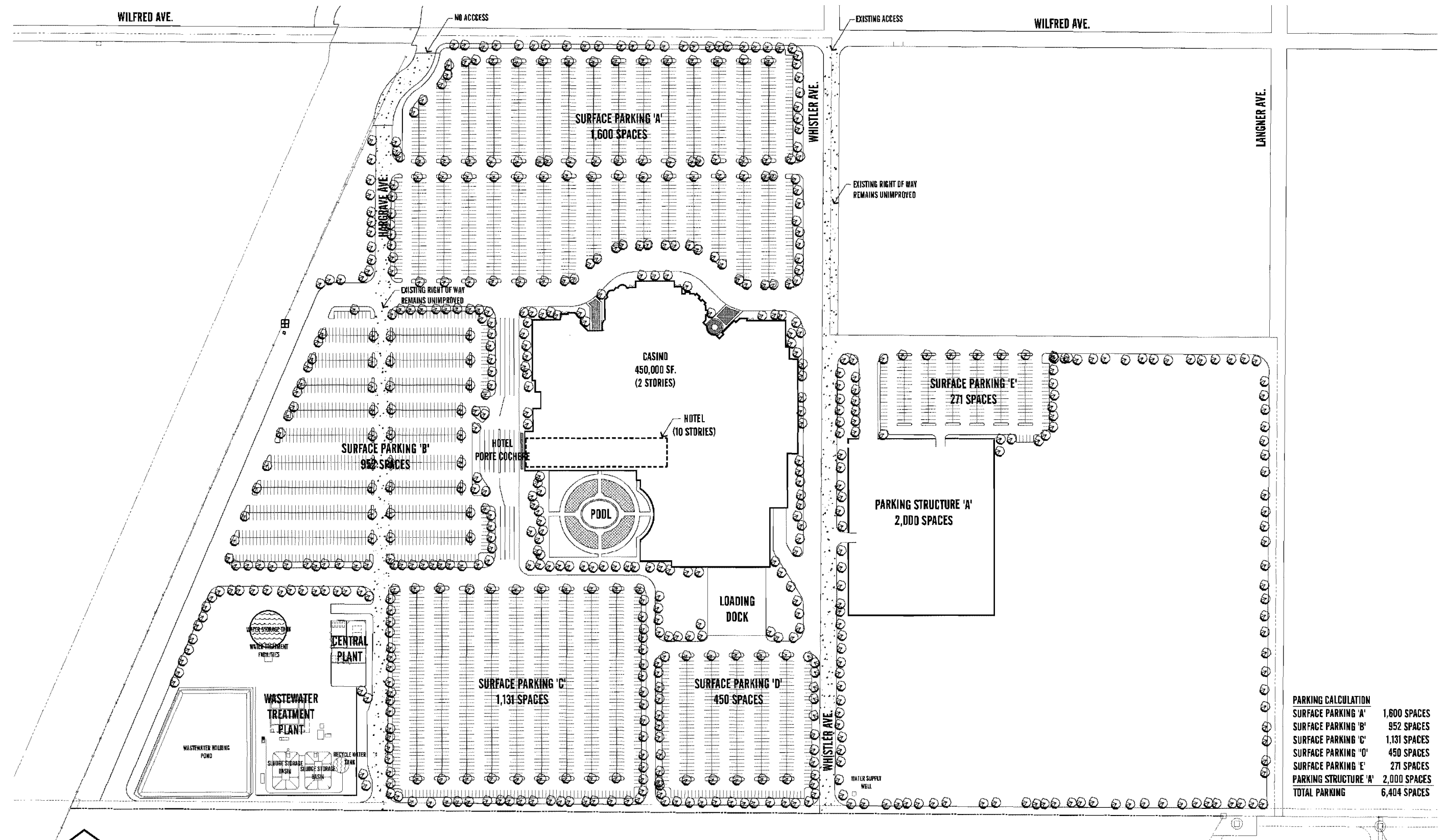
If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.



Graton Rancheria Alternative C – Rohnert Park, CA

FIGURE C1

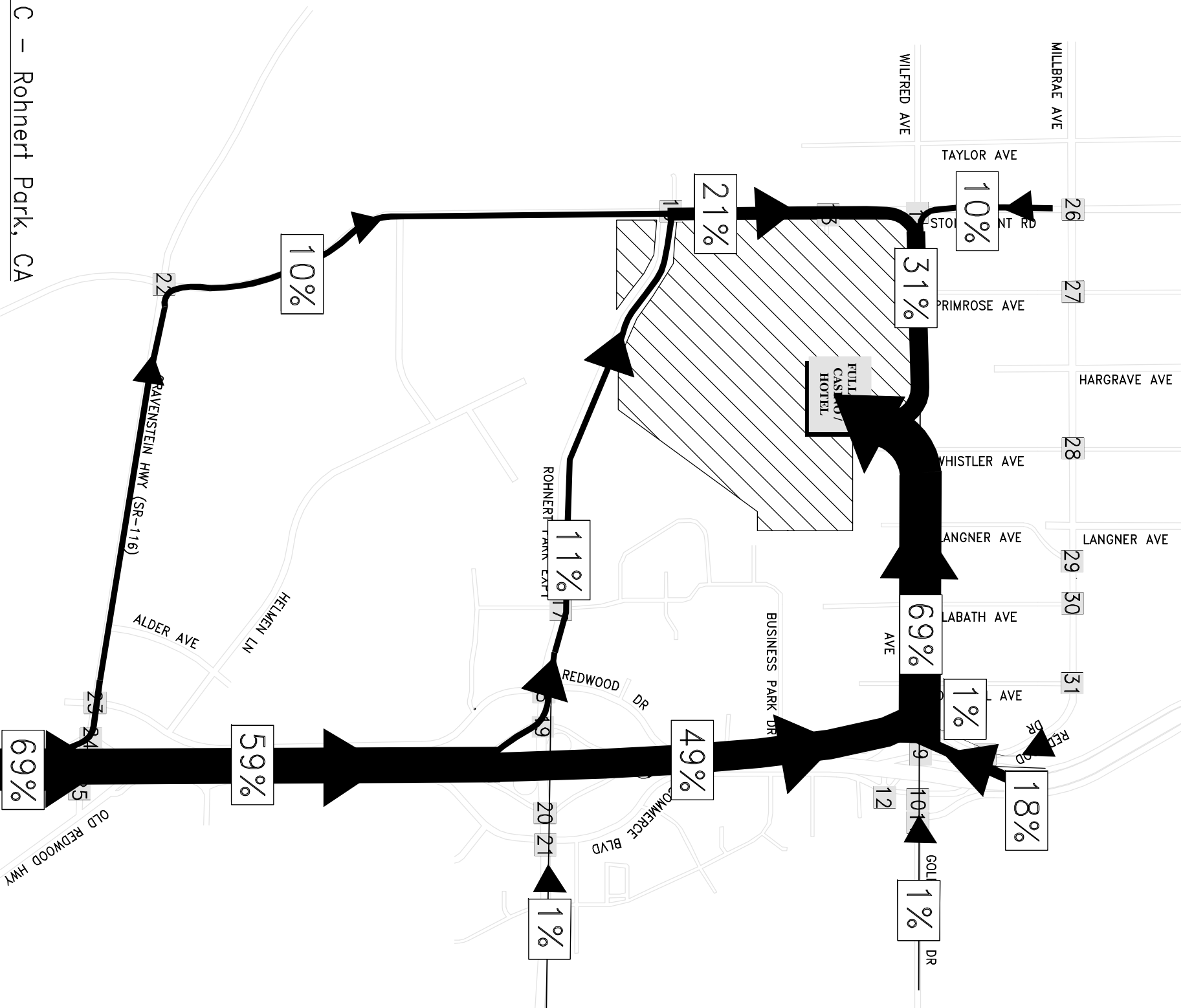


Graton Rancheria Alternative C – Rohnert Park, CA

SITE PLAN

FIGURE C2

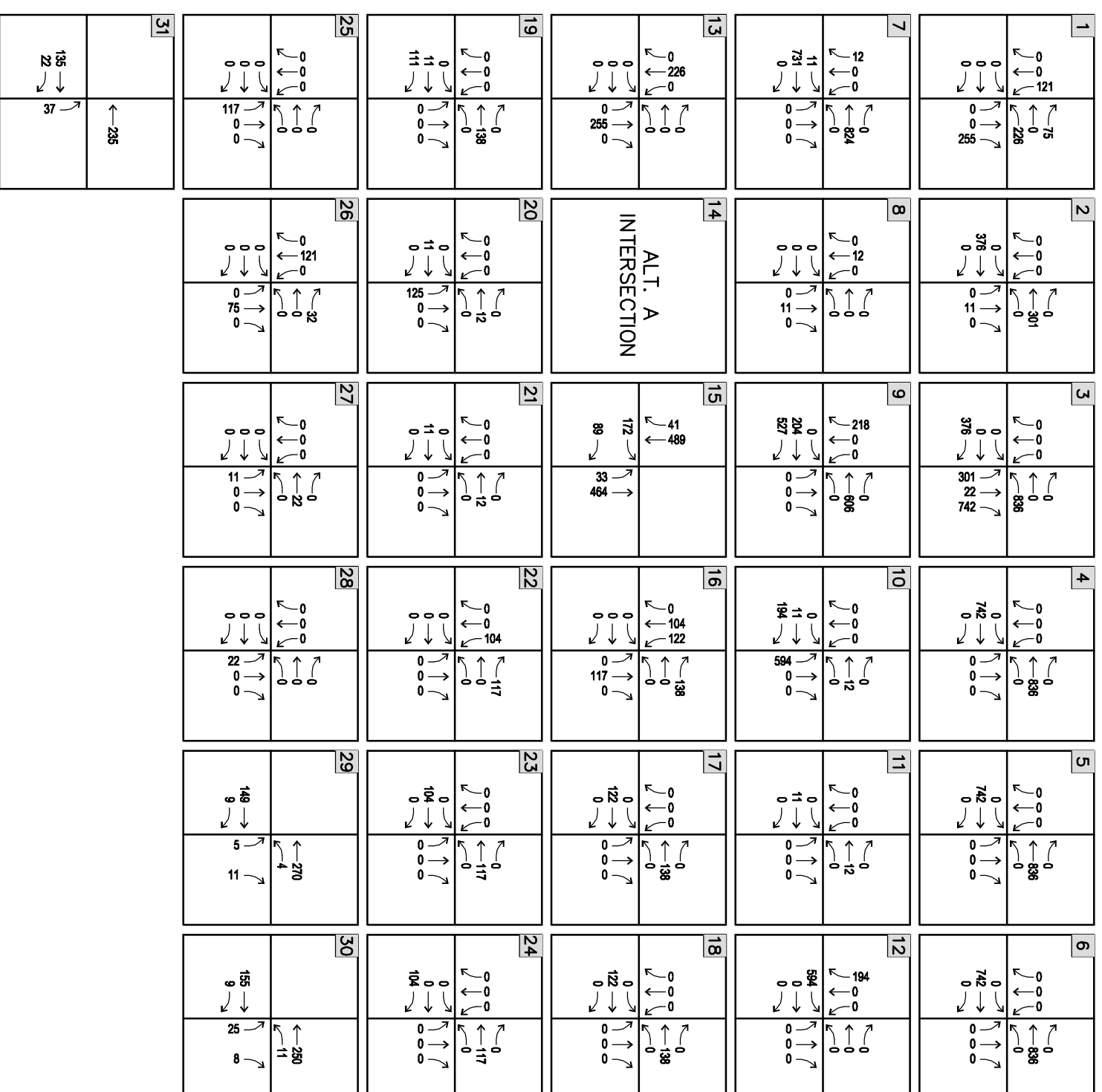
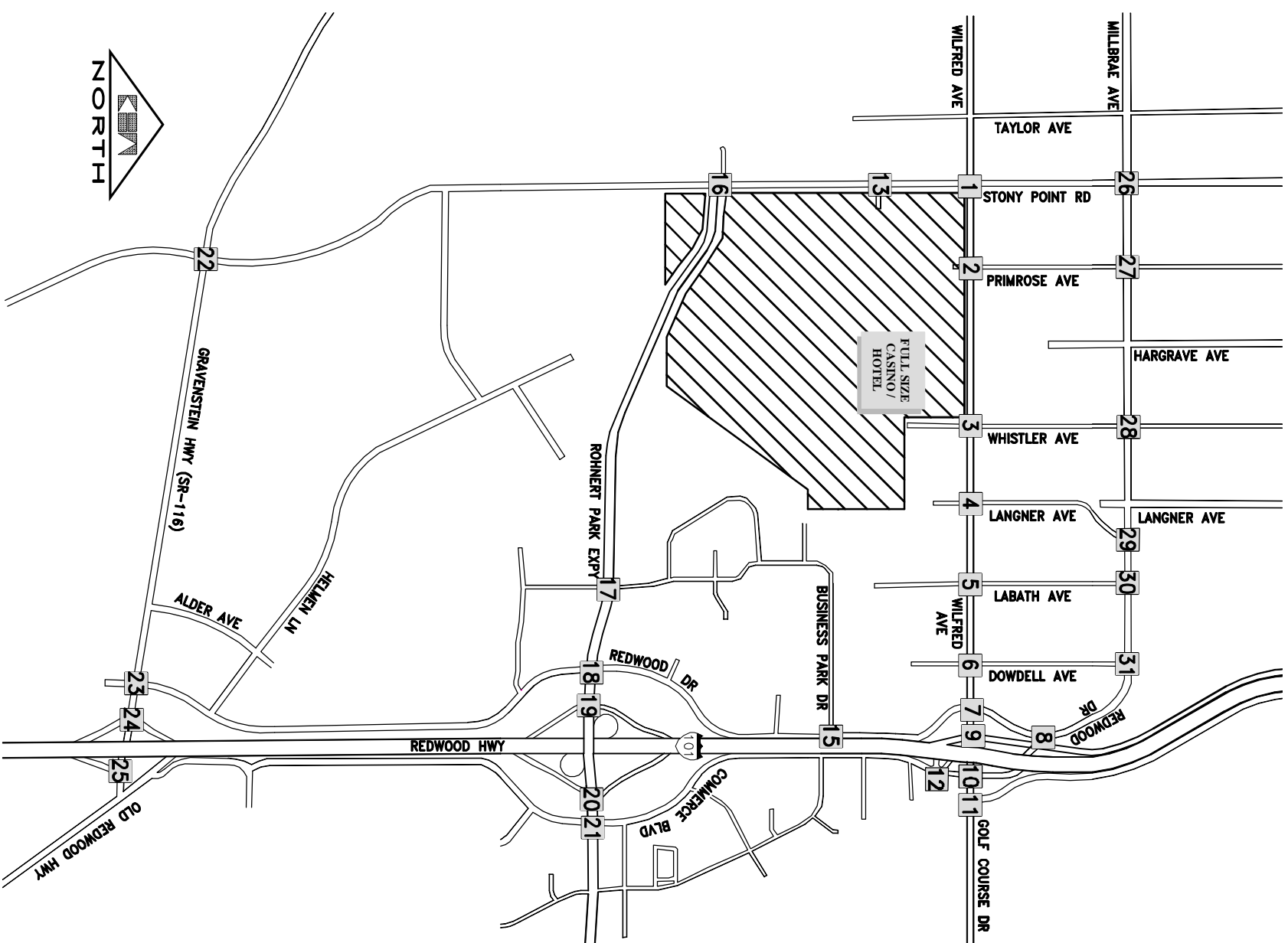




Graton Rancheria Alternative C – Rohnert Park, CA

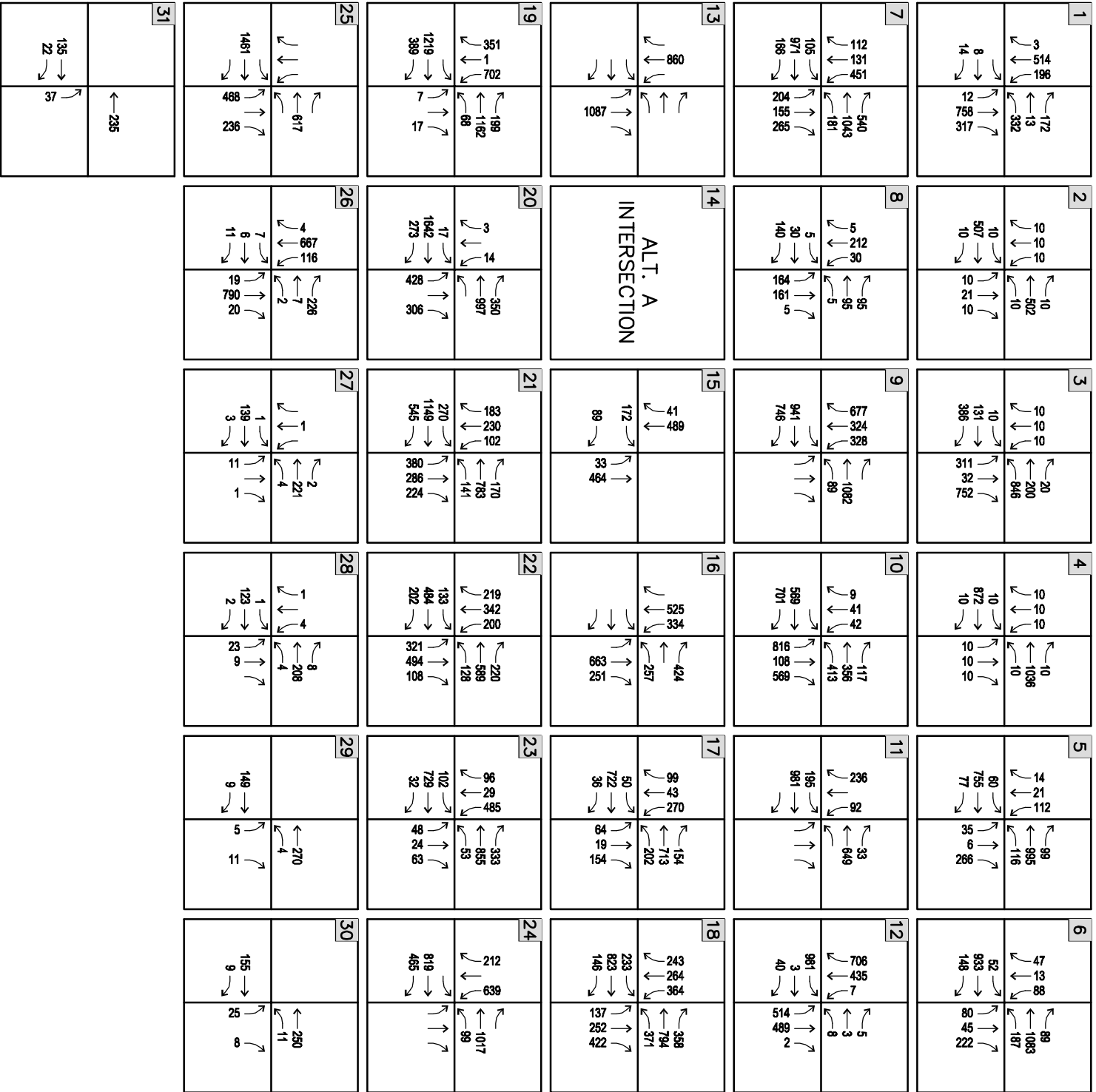
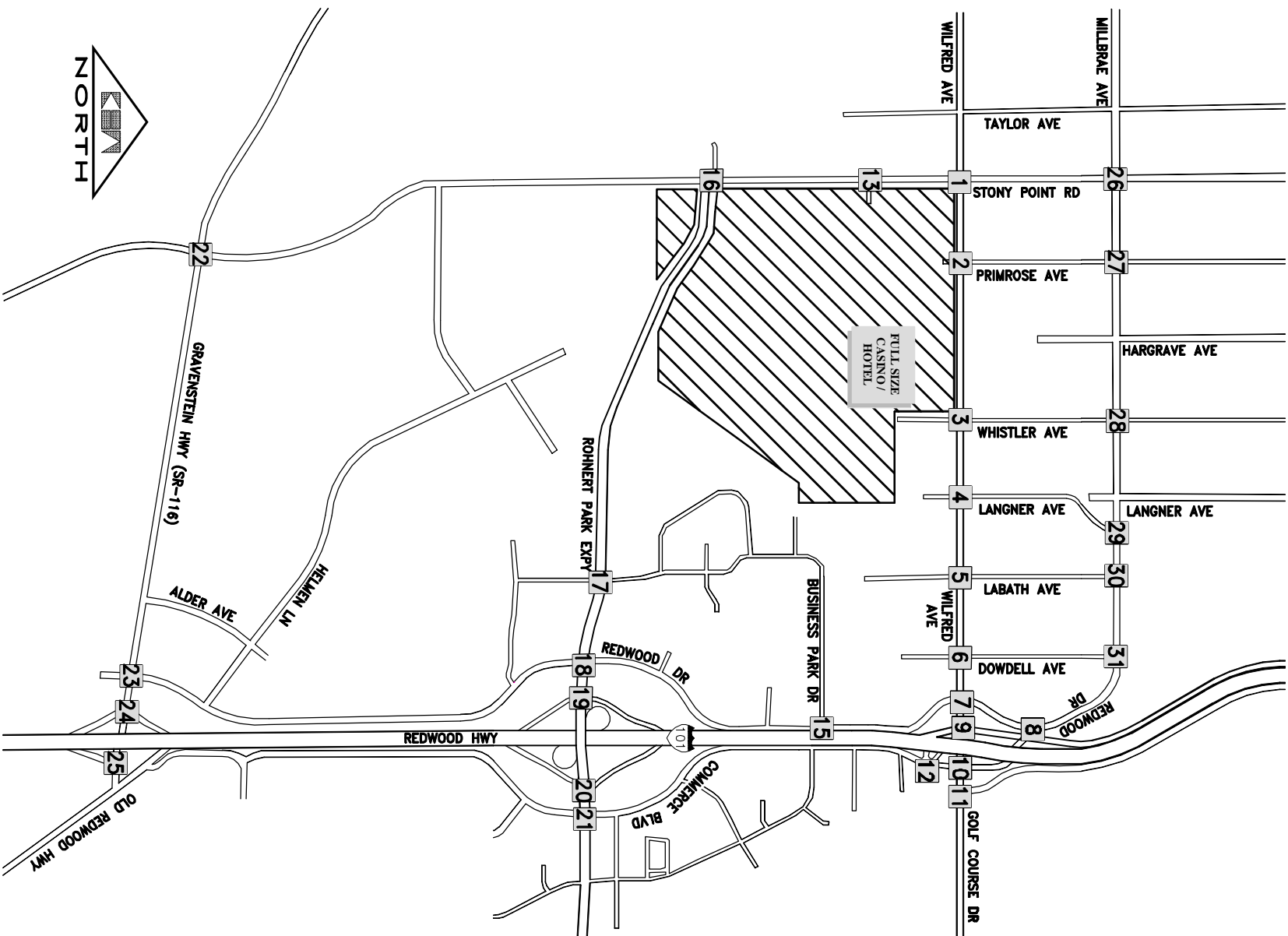


FIGURE C3



Graton Rancheria Alternative C – Rohnert Park, CA

FIGURE C5



LEGEND

X

STUDY AREA INTERSECTIONS

XXTRAFFIC VOLUMES

Graton Rancheria Alternative C – Rohnert Park, CA

FIGURE C6

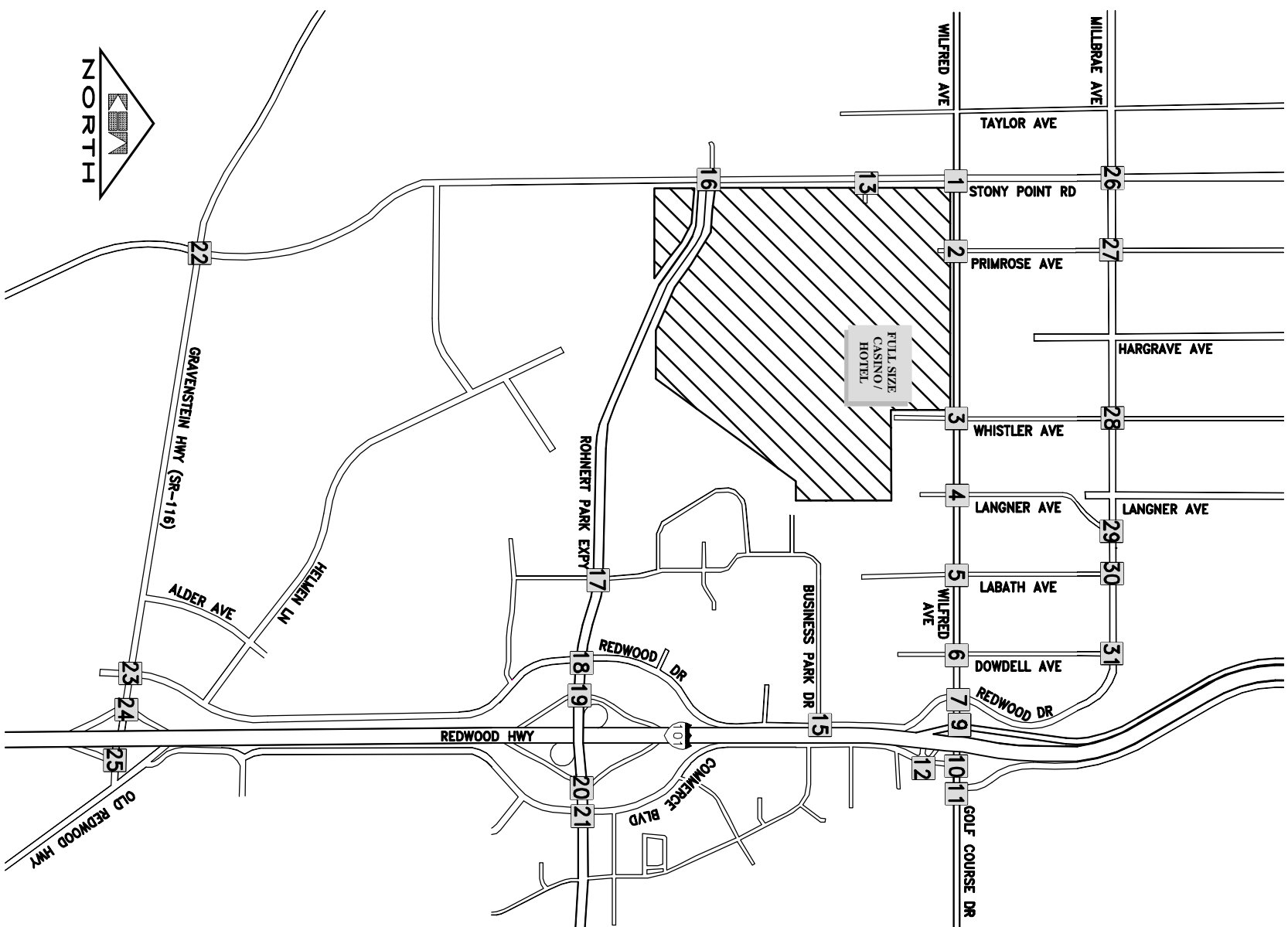
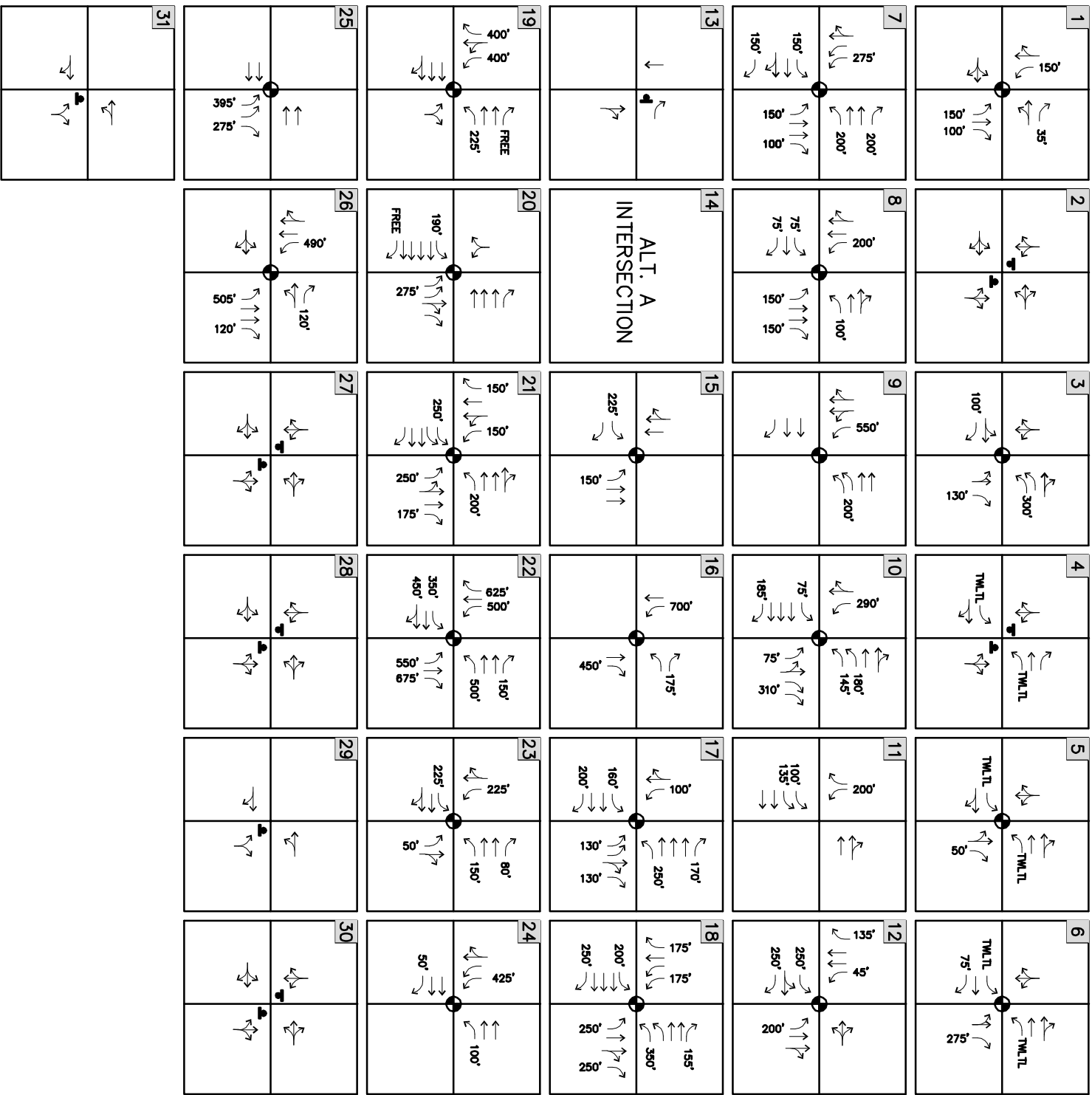
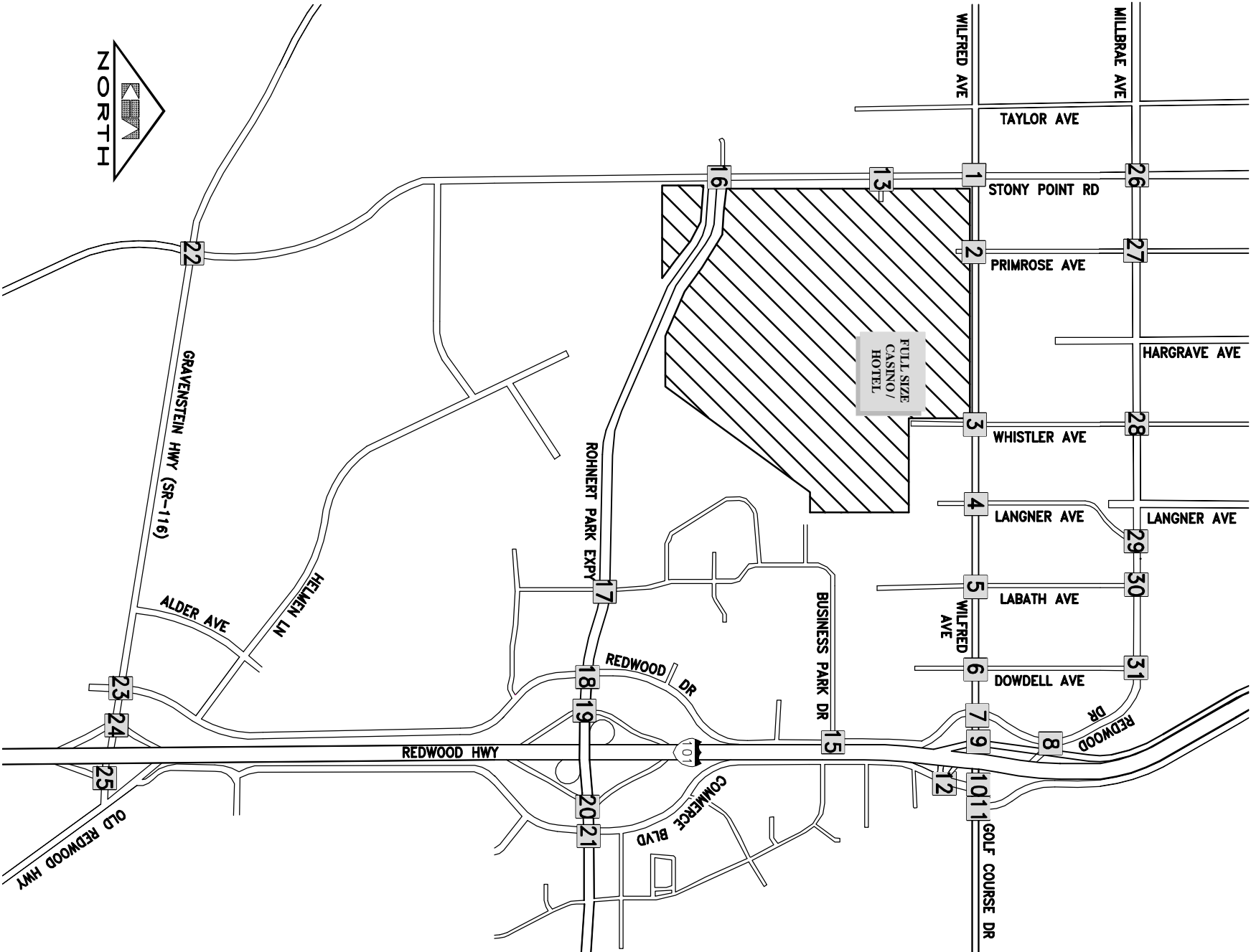
[illegible]

FIGURE C7

Graton Rancheria Alternative C – Rohnert Park, CA

LONG-TERM + PROJECT PM TRAFFIC VOLUMES

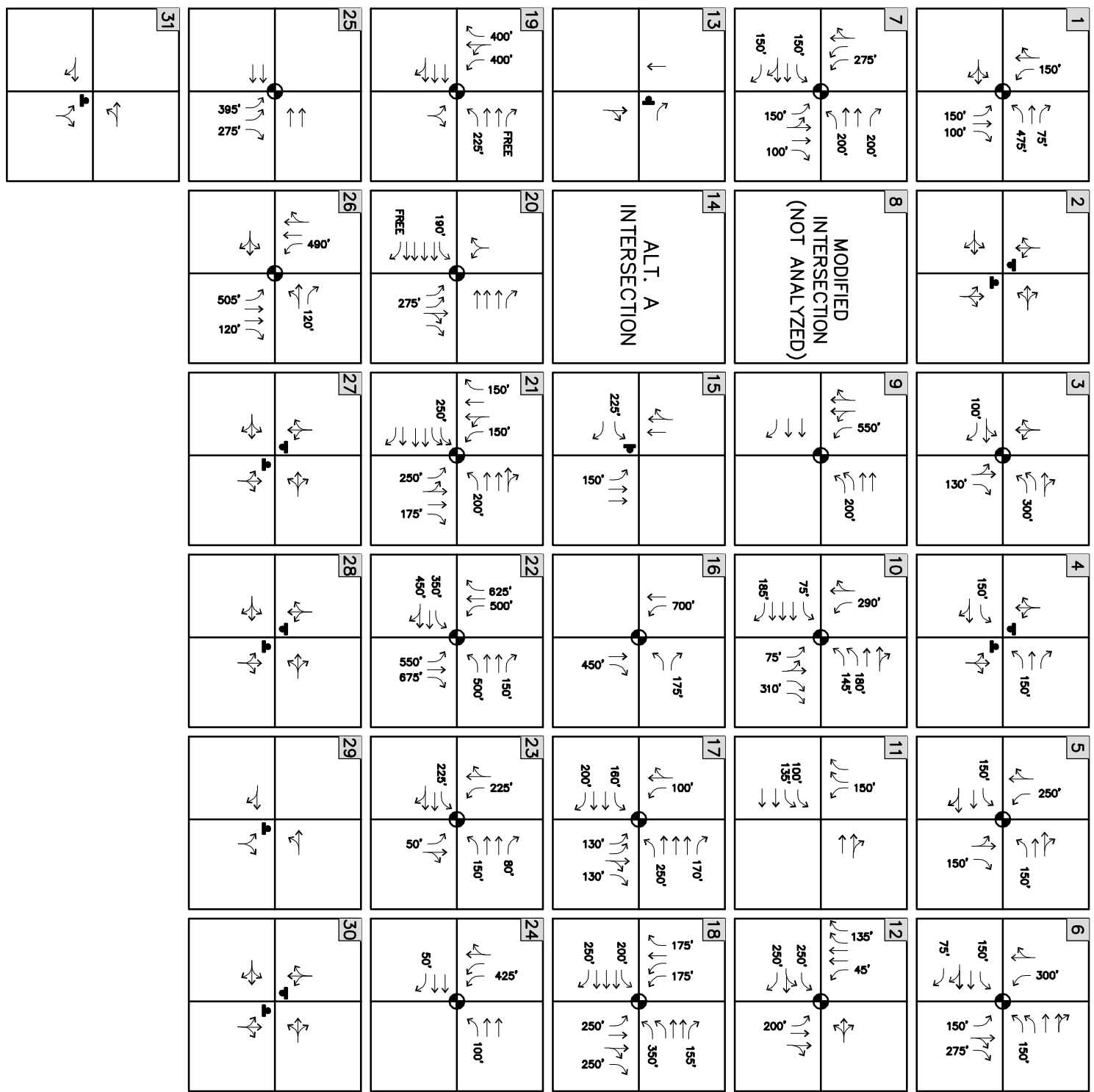
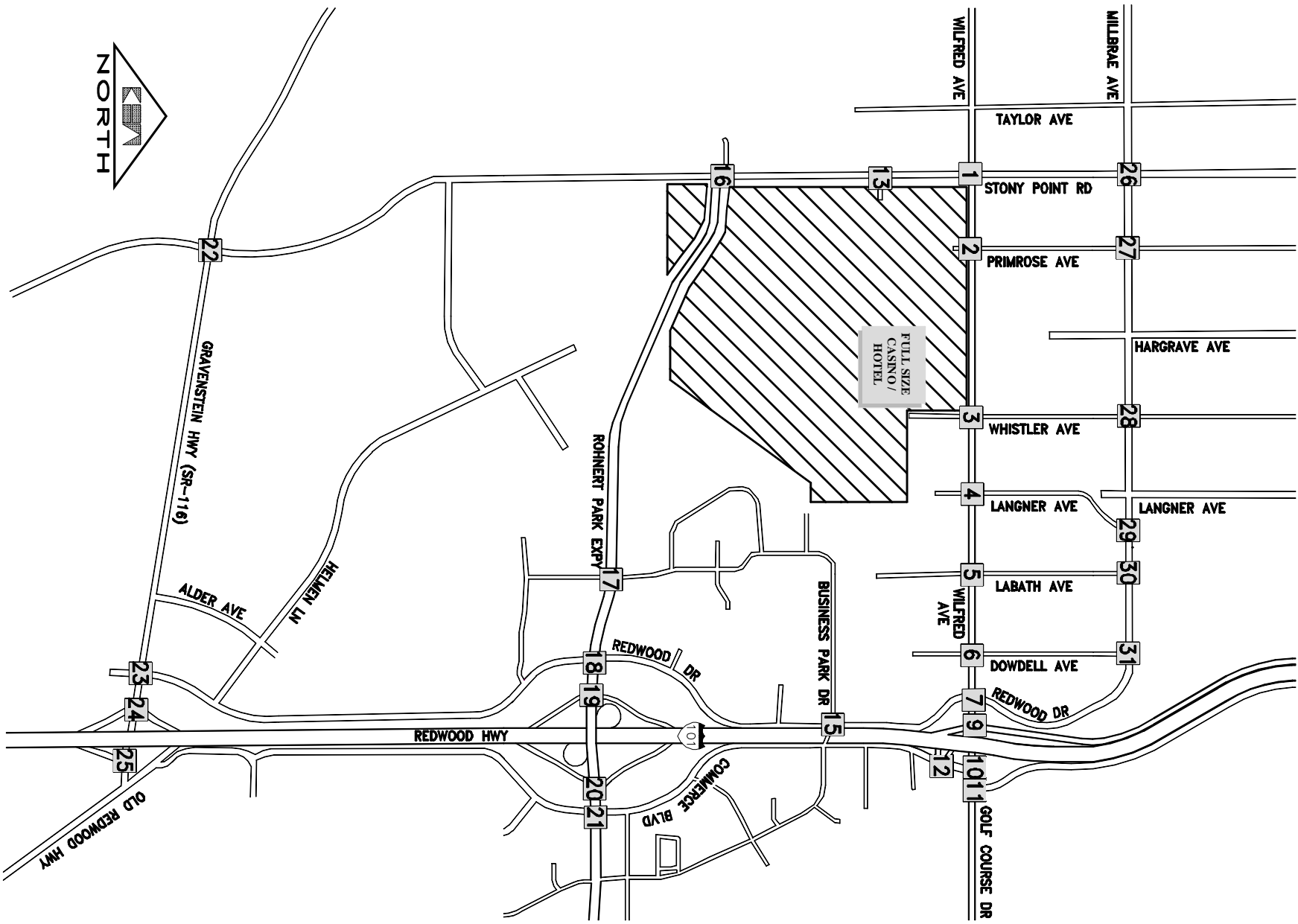


LEGEND

- ☒ STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- STORAGE LENGTH

Graton Rancheria Alternative C – Rohnert Park, CA

NEAR-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL



LEGEND

- [X] STUDY AREA INTERSECTIONS
- [Traffic Signal Symbol] TRAFFIC SIGNAL
- [Stop Sign Symbol] STOP SIGN
- XX' STORAGE LENGTH

Graton Rancheria Alternative C – Rohnert Park, CA

LONG-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE C9

Kimley-Horn and Associates, Inc.

ALTERNATIVE D – NORTHWEST STONY POINT REDUCED INTENSITY OPTION

The Alternative D casino and hotel is proposed to be located as shown in **Figure D1**, which is bordered by Wilfred Avenue in the north, Rohnert Park Expressway in the south, Stony Point Road in the west, and Langner Avenue in the east.

Figure D2 shows the proposed layout of the casino and hotel facility. As seen in the figure, the buildings and other related facilities are located in the northwest corner of the site. The site layout includes a main building of approximately 315,100 square feet for a casino, restaurants, food court, event center, banquet facilities, lobby, pool, and other ancillary functions. In addition the project is planned to include up to 100 hotel rooms, primarily for casino guests.

A breakdown of square footage as it relates to traffic impacts is shown below:

- Casino and Entertainment areas – 293,250 s.f.
- Lobby/Bar/Back of House/Sundries – 14,750 s.f.
- Pool – 7,100 s.f.
- 315,100 s.f.

- Hotel Rooms – 77,000 s.f.

The site plan also shows supporting uses such as parking lots, parking structure, and wastewater treatment facilities. This layout is virtually the same as Alternative A except that the project has been reduced in size and intensity.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Site Access

The main project access is from the south side of Wilfred Avenue, where an existing driveway aligns with Primrose Avenue. This approach is assumed to operate as a full movement driveway with no turn limitations.

A second project access from Stony Point Road is located on this plan approximately 880 feet south of the Stony Point Road/Wilfred Avenue intersection. The location is at an existing driveway access; however, due to conflicts with the northbound turn bay at the Stony Point Road/Wilfred Avenue intersection, the access is assumed to be limited to right in/out operation.

Currently, neither access is signalized.

Trip Generation – Alternative D

Project trip generation for Alternative D is shown in **Table D1**. Additional trip generation calculations are contained in the **Appendix**. Since Alternatives D and H are both casinos with the same amount of gaming and hotel space, trip generation numbers are the same for both Alternatives. As seen in the table Alternatives D and H are expected to generate 949 new trips in the AM and 1,580 new trips in the PM peak hour. Although project trip generation was prepared for daily, AM, and PM periods, only the weekday PM traffic conditions were evaluated in this report because it represents the time period where the project will contribute to the greatest amount of congestion and potential mitigation. Other time periods that were considered included weekday AM, weekday late PM, and Saturday. On weekday late evenings and Saturday evenings the casino facility will generate more trips than during the 4-6 PM weekdays, but the background traffic is lower, making the overall number of vehicles on the road lower as well. Therefore, the PM peak represents the worst case period to evaluate.

Table D 1 – Alternatives D and H Project Trip Generation

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Casino 315,100 s.f.	12,424	651	279	930	827	733	1,560
Hotel 100 Room*	272	12	7	19	11	9	20
Net New Vehicle Trips	12,696	663	286	949	838	742	1,580

*Trip rate is ITE Land Use Code 310 – Hotel. Rate reduced by 2/3 to account for internal capture to/from casino.

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to destinations north of the site, with the remaining 70% distributed south of the site. To be conservative, no project traffic was assumed to be generated or attracted in the immediate vicinity of the project site. The project traffic distribution is shown in **Figure D3** and **Figure D4**. **Figure D5** illustrates project traffic assigned to the study intersections based on the assumed trip distribution. As seen in **Figure D5**, most of the project traffic is expected to come from the freeway therefore it was assumed that most of the traffic would use Primrose Avenue because of its closer proximity to the freeway. As noted in the distribution, some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the Alternative D casino and hotel project. **Figure D6** illustrates the combined near-term turning movement volumes at the study intersections.

Cumulative Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the Alternative D casino and hotel project. **Figure D7** illustrates the combined long-term turning movement volumes at the study intersections.

Alternative D LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions:

- Near-term conditions with Alternative D (year 2008)
- Long-term Cumulative conditions with Alternative D (year 2020)

In the near-term analysis for Alternative D, it was assumed that the Wilfred Avenue widening project will not have taken place before the casino/hotel opens. The Memorandum of Understanding (MOU) between the City of Rohnert Park and the Federated Indians of the Graton Rancheria stated that the tribe would help financially to speed up the timeline of the widening project to occur before the casino/hotel opens in 2008.

Results of the analysis are presented in **Table D2**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

Table D 2 – Alternative D Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	F	841.3	F	OVRFL
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	743.6	B	12.5	F	OVRFL
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	E	35.5	B	12.5	E	42.9
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	E	35.1	B	12.5	E	42.7
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	206.0	F	169.9	F	215.4
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	25.0	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	25.7	C	26.8	C	28.9
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	83.0	E	74.2	F	101.1
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.4	B	19.0	B	19.1
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	61.7	D	50.8	F	85.6
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	C	21.8	A	0.0	C	19.9
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	C	26.1	B	18.5	C	23.2
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	29.0	C	28.2	D	39.4
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	25.2	C	29.1	C	28.2
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.6	B	16.0	B	16.0
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	17.2	B	12.3	B	18.7
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	39.9	E	63.4	E	58.6
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	39.6	D	45.5	D	48.1
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	27.4	D	42.4	E	55.6
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.2	B	18.1	B	18.4
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.7	B	11.5	B	12.2
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	59.1	F	90.2	F	153.9
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.5	B	12.4	B	12.4
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.5	B	12.5	B	12.5
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.7	B	11.7

2008 Results

- Stony Point Road/Wilfred Avenue
- Primrose Avenue/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

2020 Results

- Stony Point Road/Wilfred Avenue
- Primrose Avenue/Wilfred Avenue
- Whistler Avenue/Wilfred Avenue
- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Labath Avenue
- Rohnert Park Expressway/Commerce Boulevard
- Gravenstein Highway (SR-116)/Redwood Drive
- Millbrae Avenue/Stony Point Road

Alternative D Traffic Signal Warrant Analysis

Alternative D, near-term and long-term, traffic volumes at unsignalized study intersections were compared against peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersections will satisfy traffic signal Warrant #3 by the year 2008 and 2020.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Primrose Avenue/Wilfred Avenue (2008 and 2020)
- Labath Avenue/Wilfred Avenue (2008 and 2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Alternative D LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed Alternative D, reduced-intensity casino and hotel were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the casino and hotel project. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table D3**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project; however the congestion is reduced as a result of the smaller casino and hotel.

Table D 3 – Alternative D Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt D		2020		2020 + Alt D	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	23.1	C	25.6	D	33.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	31.8	D	34.1	E	39.4
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	33.4	E	36.1	F	40.9
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	27.0	D	32.3	E	40.4
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	32.5	E	37.1	F	41.6
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	D	31.4	C	23.2	F	39.9
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	C	26.8	D	29.0	D	34.7
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	C	26.8	D	29.0	D	34.7
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	C	26.8	D	29.0	D	34.7
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	32.8	E	40.4	F	43.1
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	32.8	E	40.4	F	43.1
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	32.8	E	40.4	F	43.1
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.2	D	29.7	D	31.7
Southbound											
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	C	25.5	D	28.5	D	30.3
Santa Rosa Avenue SB On-Ramp	E	D	31.2								
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	D	31.0	F	-	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.2	F	44.8	F	46.2
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	F	43.3	E	39.9	F	47.1
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	F	43.3	E	39.9	F	47.1
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	F	43.3	E	39.9	F	47.1
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.4	E	38.5	F	41.6
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	32.8	F	37.5	F	40.8
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	C	25.5	E	36.6	F	-
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	32.5	F	40.3	F	44.4
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	35.7	F	42.3	F	46.6
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	C	25.5	D	32.0	E	41.4

Potential Effects on Intersection Safety

Traffic volumes generated by the project were reviewed in consideration of existing intersection collision history and the potential for increased accidents. According to collision data, accidents involving bicyclist and pedestrians are very low. Many intersections did not report any collisions of this type during the survey period. This suggests that bicycle and pedestrian volumes are relatively low and study intersections have minimal safety hazards for individuals biking or walking. Although the project will introduce increased traffic volumes at some intersections, bicyclists and pedestrians are expected to be able to travel through study intersections with similar levels of safety. Historically casinos do not attract a significant amount of bicycle and pedestrian traffic. . Therefore, the expected amount of pedestrian and bicycle traffic is nominal and a significant increase in bicycle and pedestrian accidents is unlikely.

The potential for increased collisions between motorized vehicles was also considered. Collision frequency and severity are a function of many complex factors that vary depending on the location and type of intersection or roadway segment. Factors include traffic control such as signals or stop signs, lane and shoulder widths, grades, driveway densities, roadside hazards or obstacles, presence of left and right turn lanes, sight distance, congestion, and others.

Because of the number and interrelationships of the variables, accurate crash prediction is difficult. However, the proposed casino and hotel project will increase roadway congestion, a factor which could result in an increase in traffic collisions if left unmitigated. Other factors are expected to remain unaffected.

As noted previously, the purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development. This includes mitigation improvements to restore traffic operations to levels within acceptable standards or to levels as good as or better than without the casino/hotel project. Any potential increases in accidents due to project-related traffic would be offset by the implementation of roadway improvements included as mitigation. Therefore, if mitigations are implemented as proposed in this report, no significant increase in daytime or nighttime collisions is expected.

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table D4**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.



Table D 4 – Alternative D Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length		Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020				2008	2020
1 Stony Point Road and Wilfred Avenue	EBL				16 Stony Point Road and Rohnert Park Expy	EBL			
	EBR					EBR			
	WBL					WBL			
	WBR	35	OVFL	OVFL		WBR	175	235	139
	NBL	150	25	25		NBL			
	NBR					NBR	450	38	38
4 Langner Avenue and Wilfred Avenue	SBL	150	25	25		SBL	700	242	234
	SBR					SBR			
	EBL				17 Labath Avenue and Rohnert Park Expy	EBL	160	61	111
	EBR					EBR	200	25	29
	WBL	150		25		WBL	250	76	34
	WBR					WBR	170	25	25
	NBL					NBL	130	36	38
	NBR					NBR	130	36	37
5 Labath Avenue and Wilfred Avenue	SBL					SBL	100	193	202
	SBR					SBR			
	EBL	150		25	18 Redwood Drive and Rohnert Park Expy	EBL	200	168	124
	EBR					EBR	200	25	25
	WBL	150		25		WBL	350	153	156
	WBR					WBR	155	37	30
	NBL					NBL	250	157	210
	NBR					NBR	250	65	104
6 Dowdell Avenue and Wilfred Avenue	SBL					SBL	175	188	172
	SBR					SBR	175	58	57
	EBL	150		25	19 SB US 101 Ramps and Rohnert Park Expy	EBL			
	EBR					EBR			
	WBL	150		324		WBL	225	62	62
	WBR					WBR			
	NBL					NBL			
	NBR					NBR			
7 Redwood Drive and Wilfred Avenue	SBL					SBL	400	318	238
	SBR					SBR	400	224	264
	EBL	150		199		EBL	190	25	25
	EBR	150		289	20 NB US 101 Ramps and Rohnert Park Expy	EBR			
	WBL					WBL			
	WBR					WBR			
	NBL	150	402	1271		NBL	225	413	456
	NBR	100	95	110		NBR			
	SBL	275	351	350		SBL			
8 Redwood Drive and Commerce Boulevard	SBR					SBR			
	EBL	75	<25		21 Commerce Blvd and Rohnert Park Expy	EBL	250	69	58
	EBR	75	50			EBR			
	WBL	100	<25			WBL	200	187	222
	WBR					WBR			
	NBL	150	131			NBL	250	210	214
	NBR	150	<25			NBR	175	56	58
9 Wilfred Avenue and SB US 101 Ramps	SBL	200	40			SBL	150	98	158
	SBR					SBR	150	51	47
	EBL					EBL	350	162	183
	EBR				22 Stony Point Road and Gravenstein Hwy	EBR			
	WBL	300	35	27		WBL	500	155	170
	WBR					WBR	150	45	47
	NBL					NBL	550	296	298
	NBR					NBR	675	30	31
	SBL	250	229	251		SBL	500	200	214
10 Golf Course Drive and Commerce Blvd	SBR					SBR	625	49	54
	EBL					EBL	225	161	194
	EBR				23 Redwood Road and Gravenstein Hwy	EBR			
	WBL	150	788	997		WBL	150	60	55
	WBR					WBR	80	25	183
	NBL	150	674	854		NBL	50	65	65
	NBR					NBR			
	SBL	200	94	30		SBL	225	388	556
11 Roberts Lake Drive and Golf Course Drive	SBR					SBR			
	EBL	80	100	52	24 Gravenstein Hwy and SB US 101 Ramps	EBL			
	EBR					EBR	50	106	122
	WBL					WBL	100	102	74
	WBR					WBR			
	NBL					NBL			
	NBR					NBR			
12 Commerce Blvd and NB US 101 Ramps	SBL	200	76	83		SBL	425	222	222
	SBR					SBR			
	EBL	250	295	353	25 Gravenstein Hwy and NB US 101 Ramps	EBL			
	EBR	250	25	25		EBR			
	WBL					WBL			
	WBR					WBR			
	NBL	200	478	524		NBL	395	152	150
	NBR					NBR	275	178	201
15 Business Park Drive and Redwood Drive	SBL	100	25	25		SBL			
	SBR	175	123	197	26 Stony Point Road and Millbrae Avenue	SBR			
	EBL	225	97	40		EBL			
	EBR					EBR			
	WBL					WBL			
	WBR					WBR	120	43	163
	NBL	150	25	25		NBL	505	25	25
	NBR					NBR	120	25	25
	SBL					SBL	490	25	25
	SBR					SBR			

Alternative D Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Alternative D traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown in **Table D5** are needed in the near-term (2008) and long-term (2020).

The basis of the Alternative D mitigations is the assumption that intersection #13, the Project Driveway at Stony Point Road, should be relocated further south along Stony Point Road and be signalized so that it can function as a full movement access. This change permits more project traffic to conveniently arrive and exit from the site and use the Rohnert Park Expressway interchange, thus relieving some the traffic pressure through the Wilfred Avenue interchange.

In the event that intersection #13 cannot be relocated and signalized as discussed above, additional mitigation improvements will be needed, particularly at intersections surrounding the Wilfred Avenue interchange.

Table D6 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections.

Figures D8 and D9 illustrate the mitigated lane geometry and traffic control.

At an unsignalized intersection, the impact is considered significant if the intersection overall operates at an unacceptable level of service. It should be noted that the worst approach of the Langner Avenue/Wilfred Avenue intersection operates unacceptably in the 2020 + Alternative D scenario, but the intersection overall operates acceptably.

A single asterisk in the table denotes an intersection that operates at an acceptable level of service and does not require mitigation, but a mitigated level of service and delay are provided for reference as a result of the mitigation to signalize the Project Driveway/ Stony Point Road which changes traffic patterns at some intersections. A double asterisk indicates an intersection where the delay increases as a result of the mitigation to signalize the Project Driveway/Stony Point Road intersection.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue. The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to the Urban Growth Boundary.

From Langner Avenue west to Stony Point Road, Wilfred Avenue should be three lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and should include Class II bike lanes out to Stony Point Road to connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Stony Point Road, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

Table D 5 – Alternative D Summary of Mitigations

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	1	Stony Point Rd/ Wilfred Ave	• Signalize	No	Capacity
	2	Primrose Ave/ Wilfred Ave	• Signalize	No	Capacity
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	• Signalize • Add NB right and change NB all shared to left-through • Add SB left and change SB all shared to through-right	No Yes Yes	Capacity Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	• Signalize • Add NB right and change NB all shared to left-through • Add WB left (drop lane) and change all shared to through-right	No Yes Yes	Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	• Add EB through • Add EB left and change all-shared to through-right • Change WB left-through to WB through • Change phasing east-west to protected from split	Yes Yes No No	Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	No mitigation necessary	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	• Add an exclusive EB right turn overlap phase	No	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	Mitigation at Intersection #13 alleviated the impact here	-	-
	13	Project Driveway/ Stony Point Rd	• Signalize • Add NB right and change NB through-right to through • Add WB left out of project driveway	No Tribe land Tribe land	Capacity Capacity Capacity
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	• Extend WB right turn bay to 250 feet	Tribe land	Queue
	17	Rohnert Park Expwy/ Labath Ave	No mitigation necessary	-	-
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Extend NB left turn bay to 400 feet (from 225 feet) • Add a second NB left turn lane	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	• Add an EB right turn overlap phase • Optimize signal timing	No No	Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-



Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	1	Stony Point Rd/ Wilfred Ave	• Signalize *	No	Capacity
	2	Primrose Ave/ Wilfred Ave	• Signalize * • Add NB right and change NB all shared to left-through	No Tribe land	Capacity Capacity
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	• Signalize * • Optimize signal timing • Add NB right and change NB all shared to through-left * • Add SB left and change SB all shared to through-right *	No No Yes Yes	Capacity Capacity Capacity Capacity
	6	Dowdell Ave/ Wilfred Ave	• Signalize * • Optimize signal timing • Add 2nd WB left (drop lane) • Add a SB left and change SB all shared to through-right • Add NB right and change NB all shared to left-through * • Add a NB left and second NB right and change all shared to through	No No Yes Yes Yes Yes	Capacity Capacity Capacity Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	• Change NB through to left-through & change north-south phasing to split from protected • Optimize signal timing • Change WB left-through to through * • Change phasing east-west to protected from split *	No No No No	Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	Modified Intersection (not analyzed)	-	-
	9	Wilfred Ave/ US-101 SB Ramps	• Optimize signal timing	No	Capacity
	10	Golf Course Dr/ Commerce Blvd	• Add an exclusive EB right turn overlap phase * • Add a second exclusive EB right turn bay and change EB through-right to through	No Yes	Capacity Capacity
	11	Golf Course Dr/ Roberts Lake Rd	• Optimize signal timing	No	Capacity
	12	Commerce Blvd/ US-101 NB Ramps	• Add a second SB right turn lane. Will require a two lane on-ramp with one lane as an auxiliary lane between the Wilfred Avenue and Santa Rosa Avenue interchanges. May require additional bridge structure widening over Wilfred Avenue as well as over the Northwest Pacific Railroad tracks. • Optimize signal timing • Add a SB right turn overlap phase	Yes No No	Capacity Capacity Capacity
	13	Project Driveway/ Stony Point Rd	• Signalize * • Add NB right and change NB through-right to through * • Add WB left out of project driveway *	No Tribe land Tribe land	Capacity Capacity Capacity
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	• Change SB through-right to all-shared • Change NB/SB phasing from protected to split phasing	Yes No	Capacity Capacity
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Extend NB left turn bay to 400 feet (from 225 feet) * • Add a second NB left turn lane *	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	• Add an EB right turn overlap phase * • Optimize signal timing * • Add a third EB through lane that merges back into 2 lanes east of the intersection	No No Yes	Capacity Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	• Add an EB right turn bay for 100 feet • Optimize signal timing	Yes No	Capacity Capacity
	23	Gravenstein Hwy/ Redwood Dr	• Optimize signal timing	No	Capacity
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize *	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

* Improvement assumed to occur with 2008 mitigation

Table D 6 – Alternative D Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008						2020					
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	C	20.7	F	841.3	F	OVRFL	C	24.2
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	F	743.6	B	11.7	B	12.5	F	OVRFL	B	12.5
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	E	35.5	D	27.7 *	B	12.5	E	42.9	D	32.7 *
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	E	35.1	D	32.6 *	B	12.5	E	42.7	E	49.2
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	OVRFL	C	21.1	F	OVRFL	F	OVRFL	C	24.3
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	C	30.2	F	OVRFL	F	OVRFL	C	33.1
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	206.0	D	51.6	F	169.9	F	215.4	D	52.2
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	25.0	C	25.9 **	-	-	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	25.7	C	25.9 **	C	26.8	C	28.9	C	21.4
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	83.0	D	45.8	E	74.2	F	101.1	D	52.2
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.4	B	18.3 **	B	19.0	B	19.1	B	13.7
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	61.7	D	54.6	D	50.8	F	85.6			D	37.1
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	C	21.8	A	8.6	A	0.0	C	19.9	A	8.2
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	D	27.5	C	16.7	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	C	26.1	C	30.0 **	B	18.5	C	23.2	C	26.6 **
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	29.0	C	29.1	C	28.2	D	39.4	C	26.1
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	25.2	C	25.4 **	C	29.1	C	28.2	C	28.9 **
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.6	B	19.1	B	16.0	B	16.0	C	18.1 **
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	17.2	B	12.3	B	12.3	B	18.7	B	13.1
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	39.9	C	30.9	E	63.4	E	58.6	C	31.8
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	39.6	D	51.0 **	D	45.5	D	48.1	D	42.9
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	27.4	C	30.6 **	D	42.4	E	55.6	D	42.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.2	B	19.5 **	B	18.1	B	18.4	C	25.0 **
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.7	B	12.6 **	B	11.5	B	12.2	B	13.2 **
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	59.1	A	9.9	F	90.2	F	153.9	B	10.4
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.5	B	11.5	B	12.4	B	12.4	B	12.4
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.5	B	11.5	B	12.5	B	12.5	B	12.5
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	A	9.9	B	11.3	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	11.7	B	14.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.4	B	11.7	B	11.7	B	11.7

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table D7**:

- Adjust the ramp metering to account for the additional project traffic at the Wilfred Avenue interchange in the near-term (2008). Most metering adjustments can be minor and are not expected to have queuing effects on the local street network. However, the southbound on-ramp will require heavy metering to obtain an acceptable level of service for the freeway ramp merge area which may create a long queue backed up on the ramp.
- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Wilfred Avenue and from Gravenstein Highway (SR-116) to West Sierra Avenue as well as an additional traffic lane in the northbound direction from Wilfred Avenue to Santa Rosa Avenue in the long-term (2020).

Aside from roadway improvements to mitigate protect impacts, the casino and hotel should coordinate with the Green Music Center during outdoor events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park interchange may be necessary. Therefore, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur, the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control.

Because no fixed route service will be available at the project site, the casino/hotel should provide a shuttle that serves the two Rohnert Park transfer stations. The shuttle should run throughout the day or could be called out on demand.

The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

Table D 7 – Alternative D Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria		Existing		2008		2008 + Alt D		2008 + Alt D Mitigated		2020		2020 + Alt D		2020 + Alt D Mitigated	
	LOS	LOS	Density (pc/mi/ln)	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound																
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	23.1	C	23.1	C	25.6	D	33.4	D	33.4	
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	31.8	D	31.8	D	34.1	E	39.4	E	39.4	
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	33.4	D	33.4	E	36.1	F	40.9	E	39.1	
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	27.0	D	27.0	D	32.3	E	40.4	E	39.1	
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	32.5	D	32.5	E	37.1	F	41.6	E	39.1	
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	D	31.4	D	31.4	C	23.2	F	39.9	D	34.7	
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	C	26.8	C	26.8	D	29.0	D	34.7	D	34.7	
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	C	26.8	C	26.8	D	29.0	D	34.7	D	34.7	
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	C	26.8	C	26.8	D	29.0	D	34.7	D	34.7	
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	32.8	D	32.8	E	40.4	F	43.1	D	29.7	
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	32.8	D	32.8	E	40.4	F	43.1	D	29.7	
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	32.8	D	32.8	E	40.4	F	43.1	D	29.7	
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.2	C	23.2	D	29.7	D	31.7	D	31.7	
Southbound																
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	C	25.5	C	25.5	D	28.5	D	30.3	D	30.3	
Santa Rosa Avenue SB On-Ramp	E	D	31.2													
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	D	31.0	D	31.0	F	-	F	-	C	24.4	
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.2	E	40.2	F	44.8	F	46.2	D	32.2	
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	F	43.3	D	33.8	E	39.9	F	47.1	E	43.0	
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	F	43.3	D	33.8	E	39.9	F	47.1	E	43.0	
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	F	43.3	D	33.8	E	39.9	F	47.1	E	43.0	
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.4	D	33.4	E	38.5	F	41.6	E	38.1	
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	32.8	D	32.8	F	37.5	F	40.8	E	38.1	
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	C	25.5	C	25.5	E	36.6	F	-	E	38.1	
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	32.5	D	32.5	F	40.3	F	44.4	E	38.1	
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	35.7	E	35.7	F	42.3	F	46.6	D	28.2	
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	C	25.5	C	25.5	D	32.0	E	41.4	E	41.4	

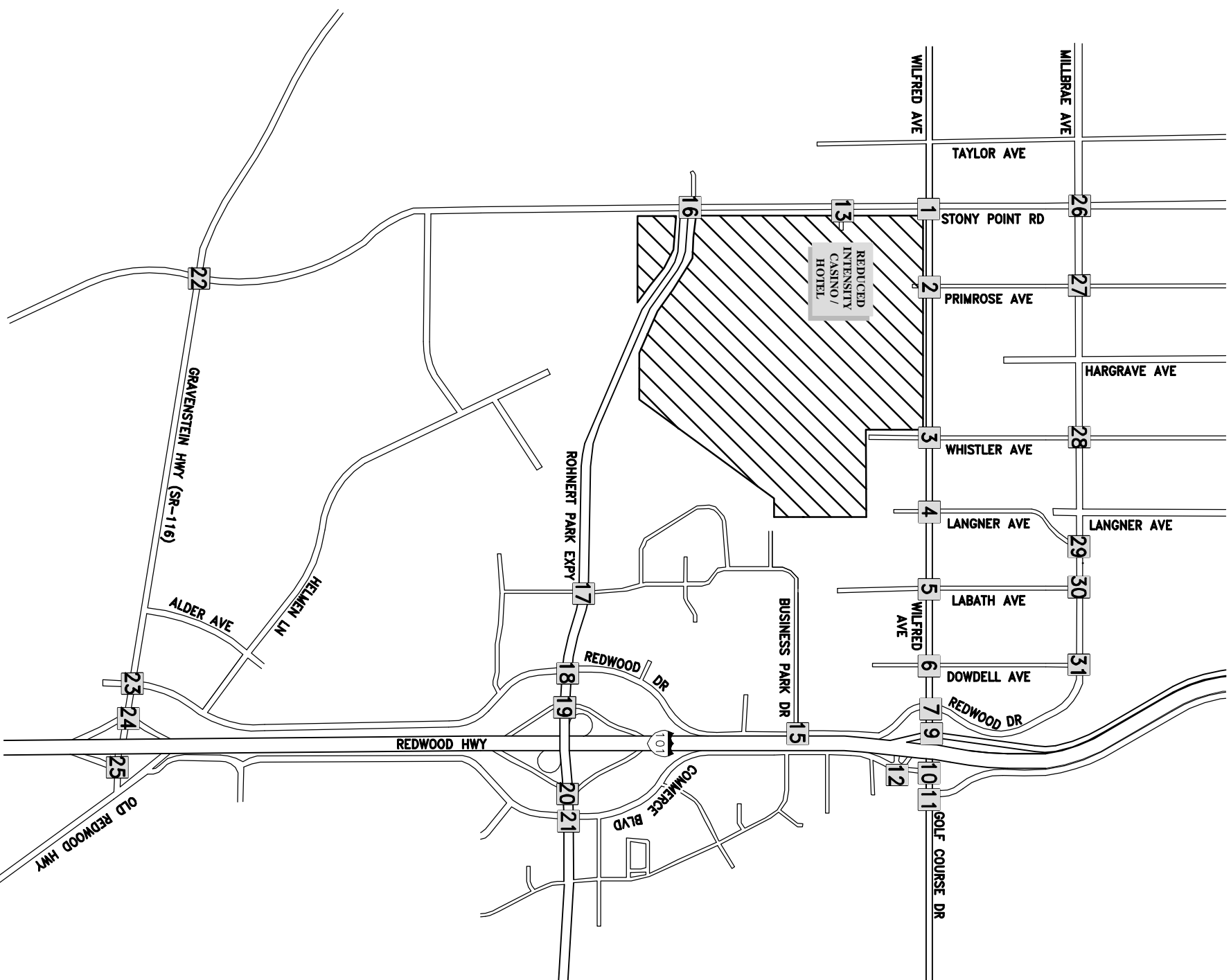
It is recommended that the casino contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating or shortening the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

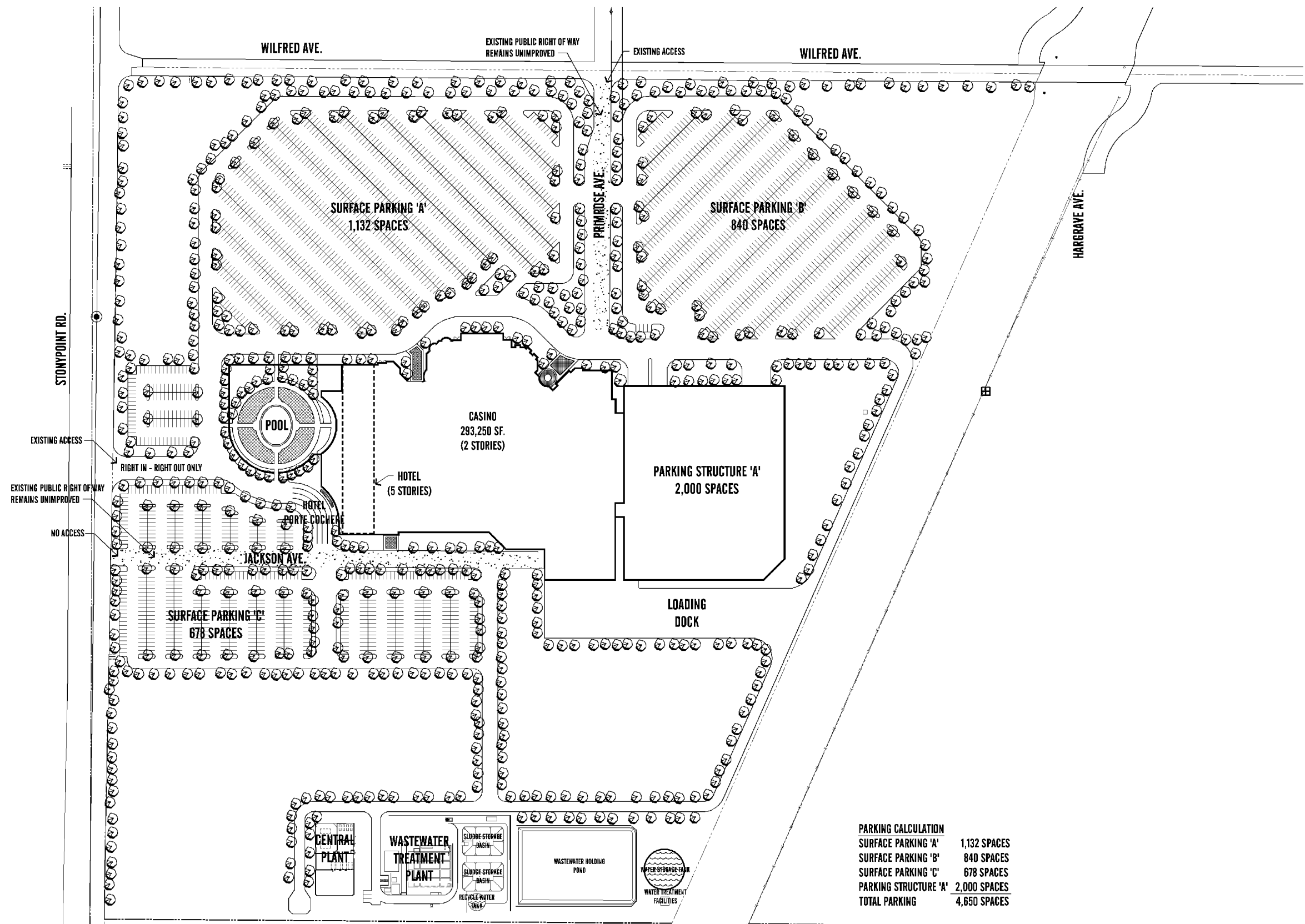
To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.



Graton Rancheria Alternative D – Rohnert Park, CA

PROJECT LOCATION

FIGURE D1

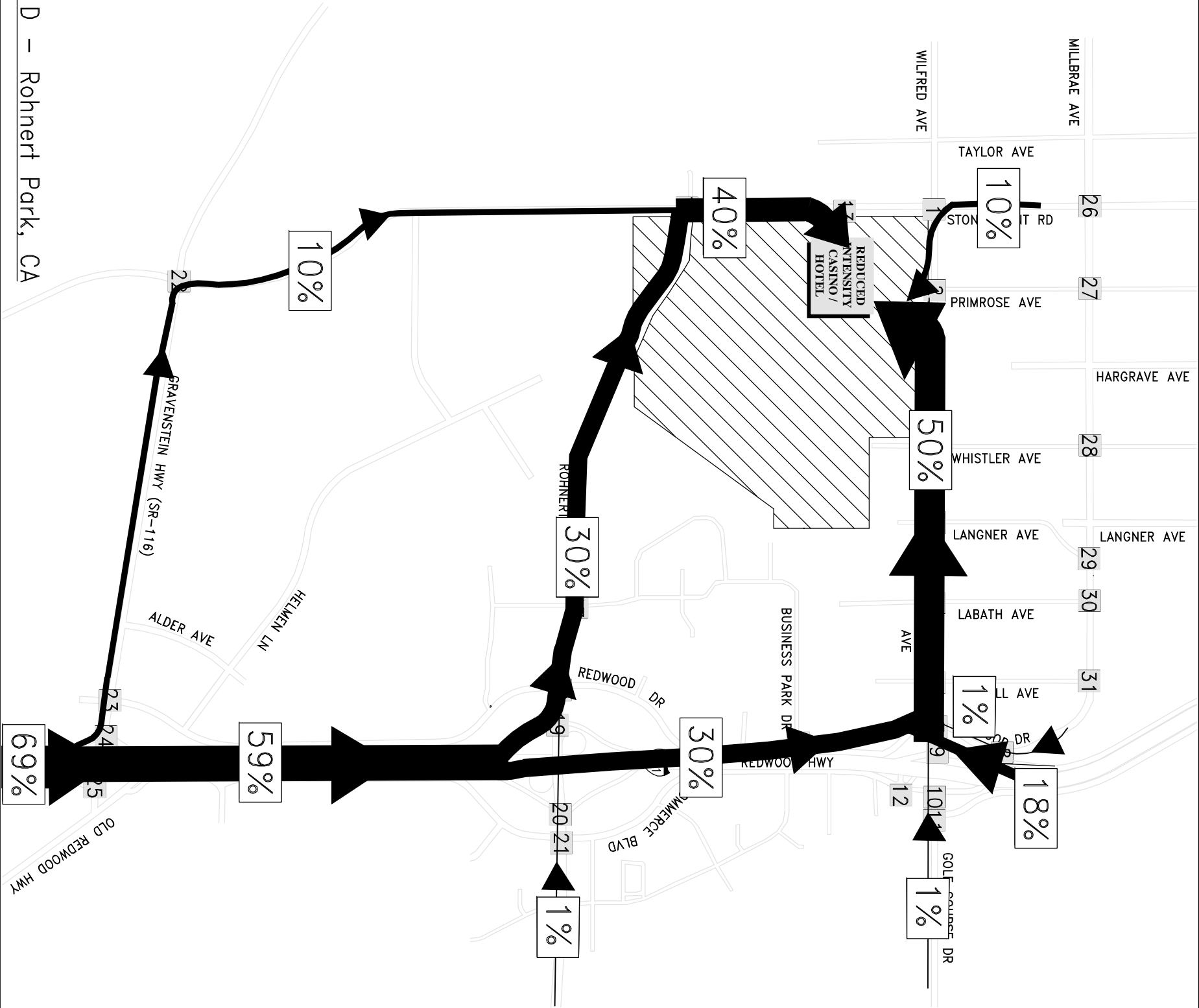


PARKING CALCULATION	
SURFACE PARKING 'A'	1,132 SPACES
SURFACE PARKING 'B'	840 SPACES
SURFACE PARKING 'C'	678 SPACES
PARKING STRUCTURE 'A'	2,000 SPACES
TOTAL PARKING	4,650 SPACES

Graton Rancheria Alternative D – Rohnert Park, CA

SITE PLAN

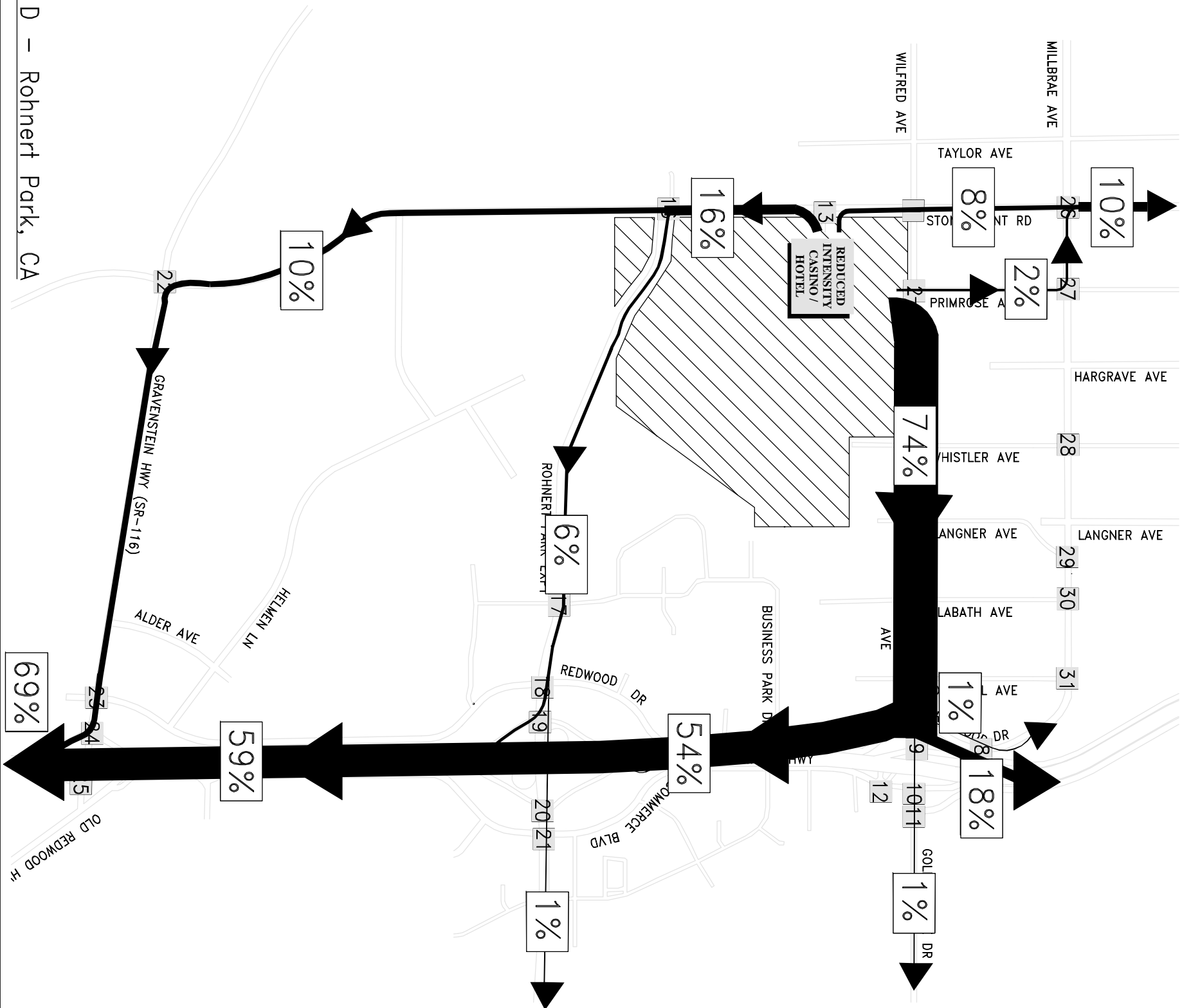
FIGURE D2



Graton Rancheria Alternative D – Rohnert Park, CA



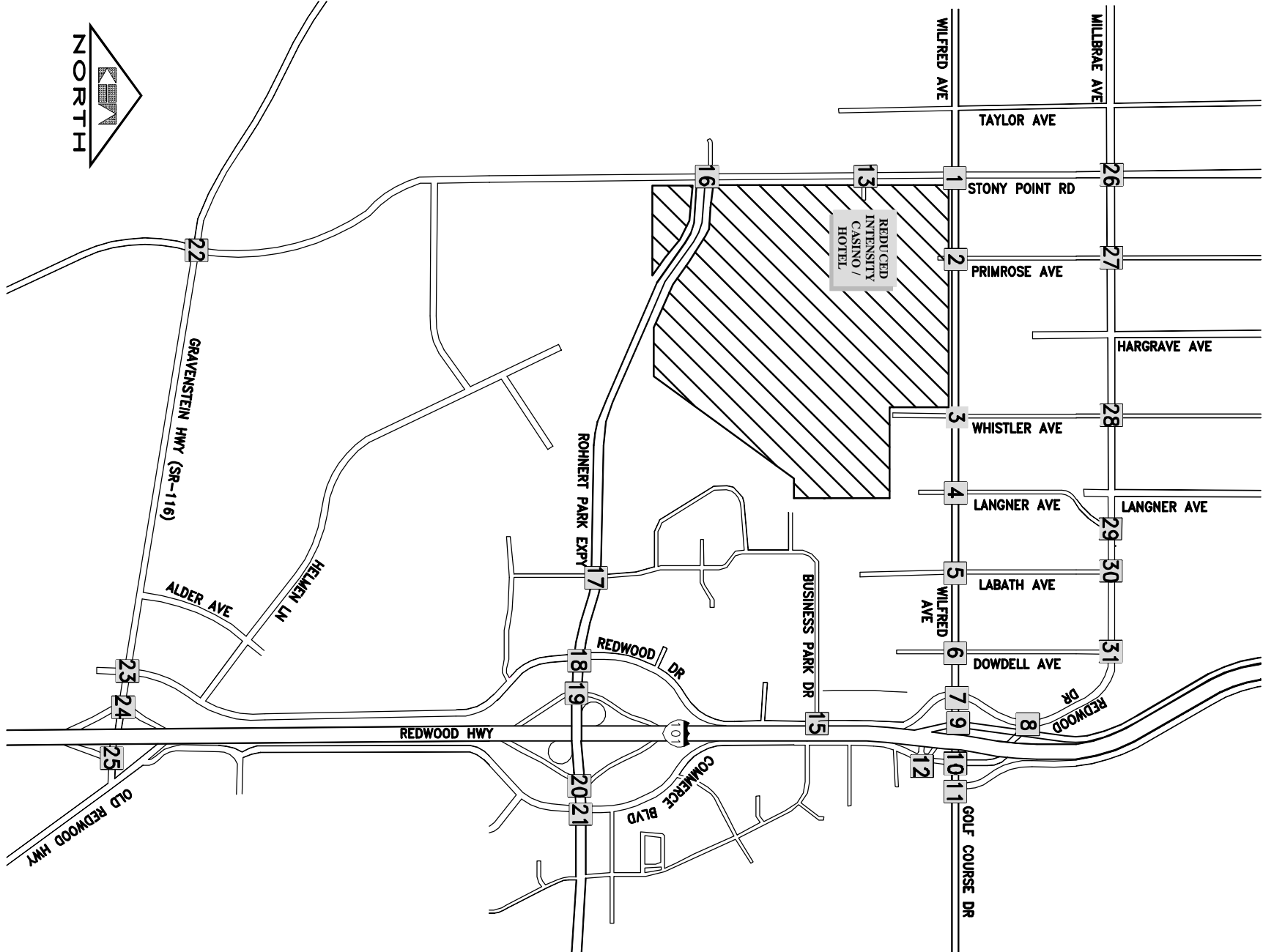
FIGURE D3



Graton Rancheria Alternative D – Rohnert Park, CA

FIGURE D4

Graton Rancheria Alternative D – Rohnert Park, CA



1	84 ↖ ←120 ↗ 55	2	84 ↖ ↖422 ↗ ↗ 120 15 55	3	548 → ←422	4	548 → ←422	5	548 → ←422	6	548 → ←422	
7	8 ↖ ←414 ↗ 540 →	8	8 ↖ 7 →	9	151 ↖ ←263 141 → 389 ↖	10	7 → ↖ 134 ↖ 254	11	7 → ←8	12	134 ↖ 254 ↖	
13	120 ↖ 59 ↖ 332	14	ALT. A INTERSECTION		15		16	77 ↖ 43 ↖ 251 ↖ 18 →	17	43 → ←251	18	43 → ←251
19	7 → ↖ 36 ↖ ←251	20	7 → ↖ 243 ↖ ←8	21	7 → ←8	22	77 ↖ ↖ 81 ↖	23	77 → ←81	24	77 ↖ ←81	
25	81 ↖	26	84 ↖ 15 ↖ 55 →	27	15 ↖	28		29		30		
31												

LEGEND

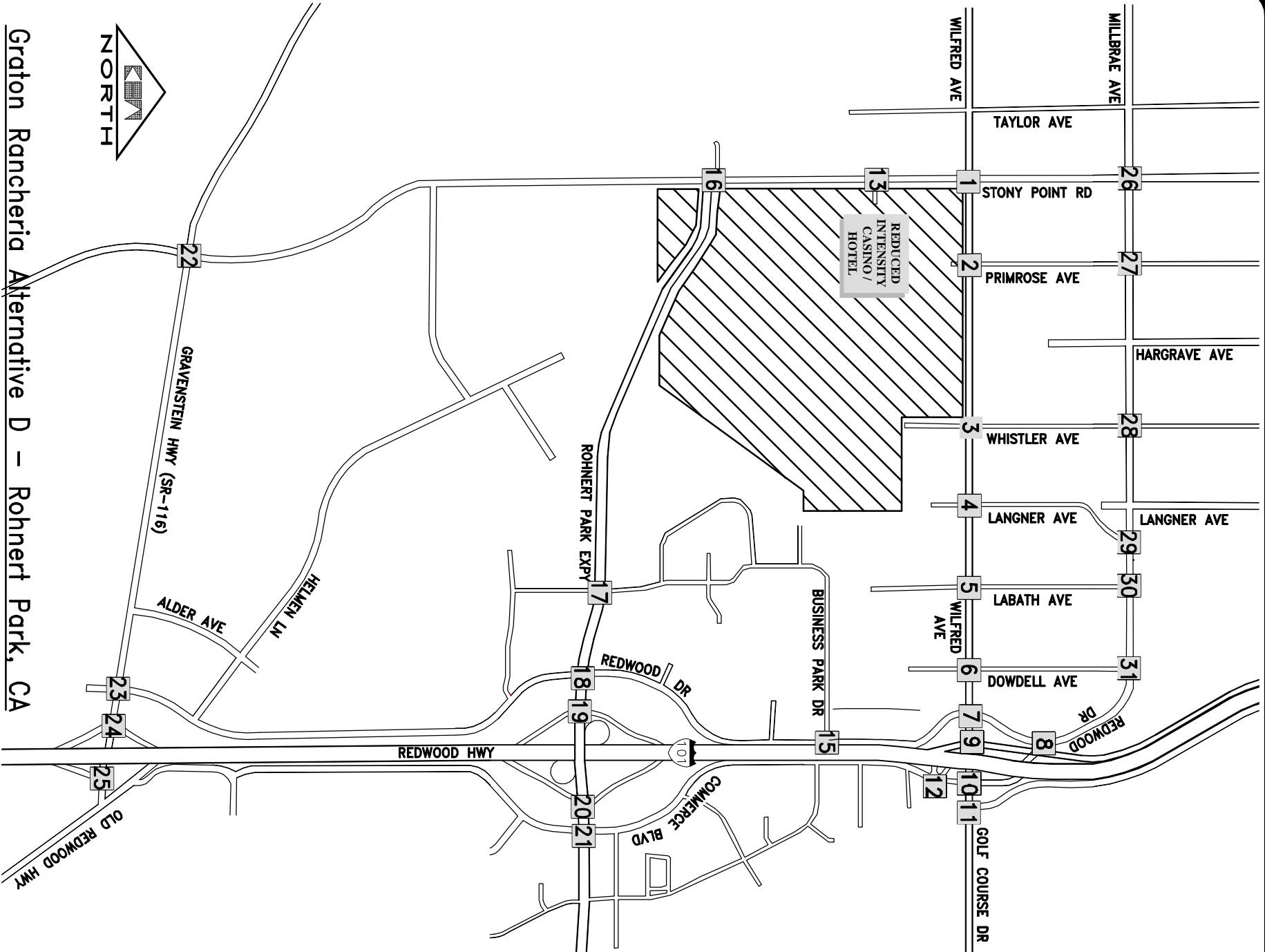
X

STUDY AREA INTERSECTIONS

XX

TRAFFIC VOLUMES

FIGURE D5



<div>1</div> <div><div><div>514</div><div>182</div><div>97</div><div>13</div><div>226</div><div>8</div><div>14</div><div>12</div><div>817</div><div>28</div></div></div>	<div>2</div> <div><div><div>10</div><div>201</div><div>432</div><div>131</div><div>94</div><div>10</div><div>131</div><div>130</div><div>25</div><div>88</div></div></div>	<div>3</div> <div><div><div>20</div><div>622</div><div>10</div><div>679</div><div>10</div><div>10</div><div>679</div><div>10</div><div>10</div><div>622</div></div></div>	<div>4</div> <div><div><div>10</div><div>622</div><div>10</div><div>678</div><div>10</div><div>10</div><div>678</div><div>10</div><div>10</div><div>622</div></div></div>	<div>5</div> <div><div><div>99</div><div>561</div><div>116</div><div>60</div><div>561</div><div>77</div><div>14</div><div>21</div><div>112</div><div>14</div><div>21</div><div>112</div></div></div>	<div>6</div> <div><div><div>89</div><div>689</div><div>187</div><div>52</div><div>738</div><div>148</div><div>47</div><div>13</div><div>88</div><div>47</div><div>13</div><div>88</div></div></div>
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LEGEND

X

STUDY AREA INTERSECTIONS

XX

TRAFFIC VOLUMES

FIGURE D6

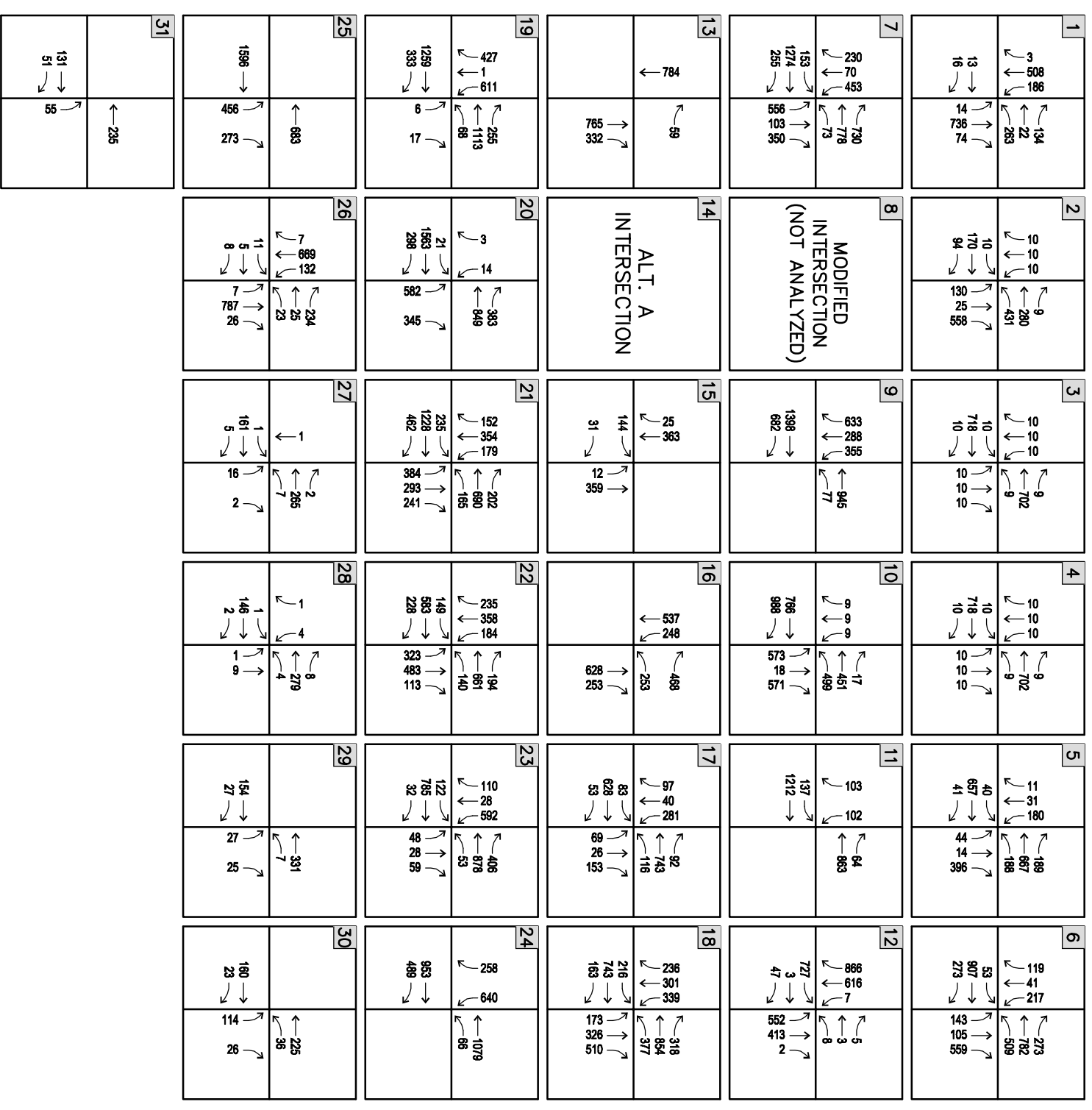
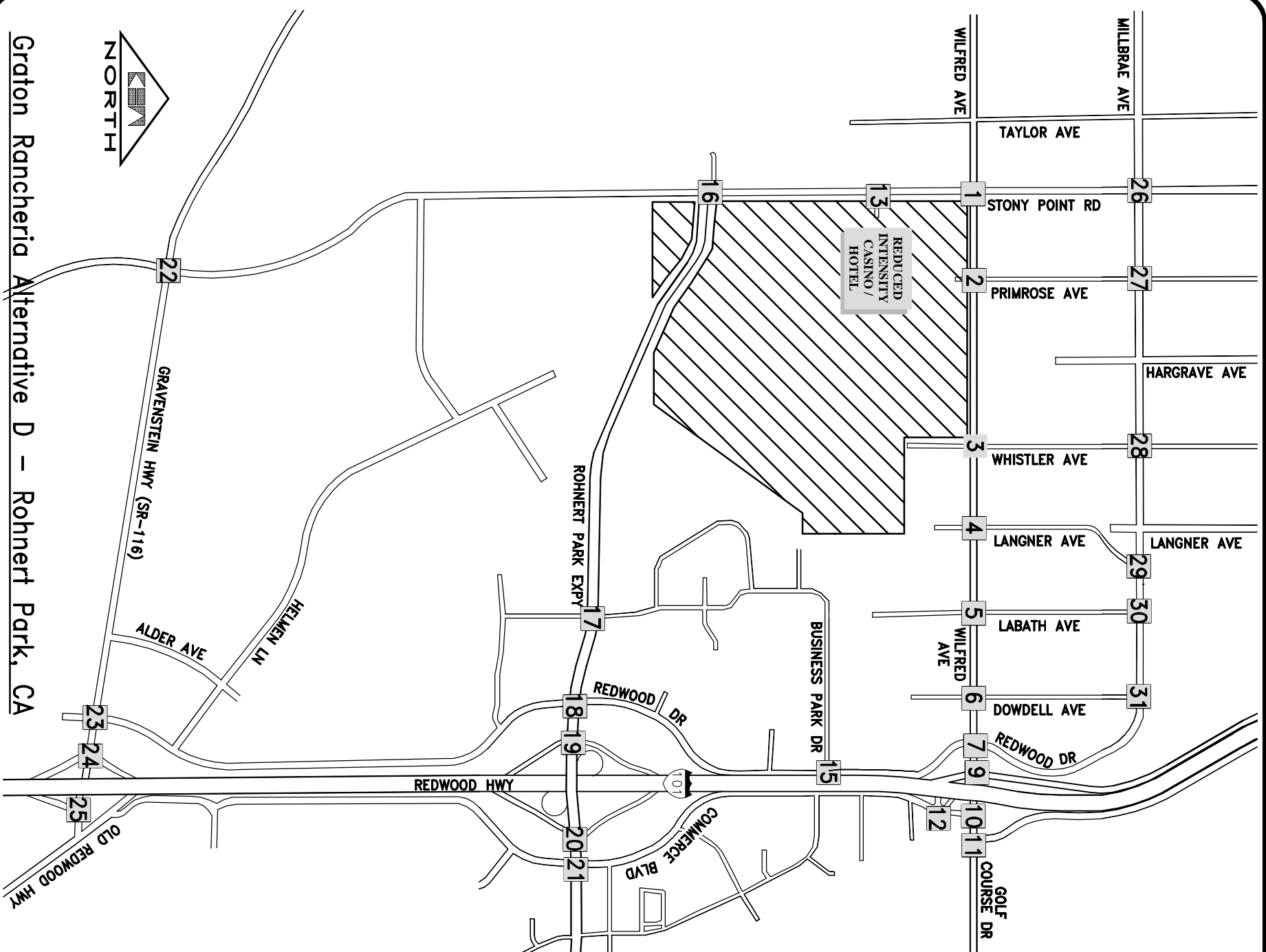


FIGURE D7

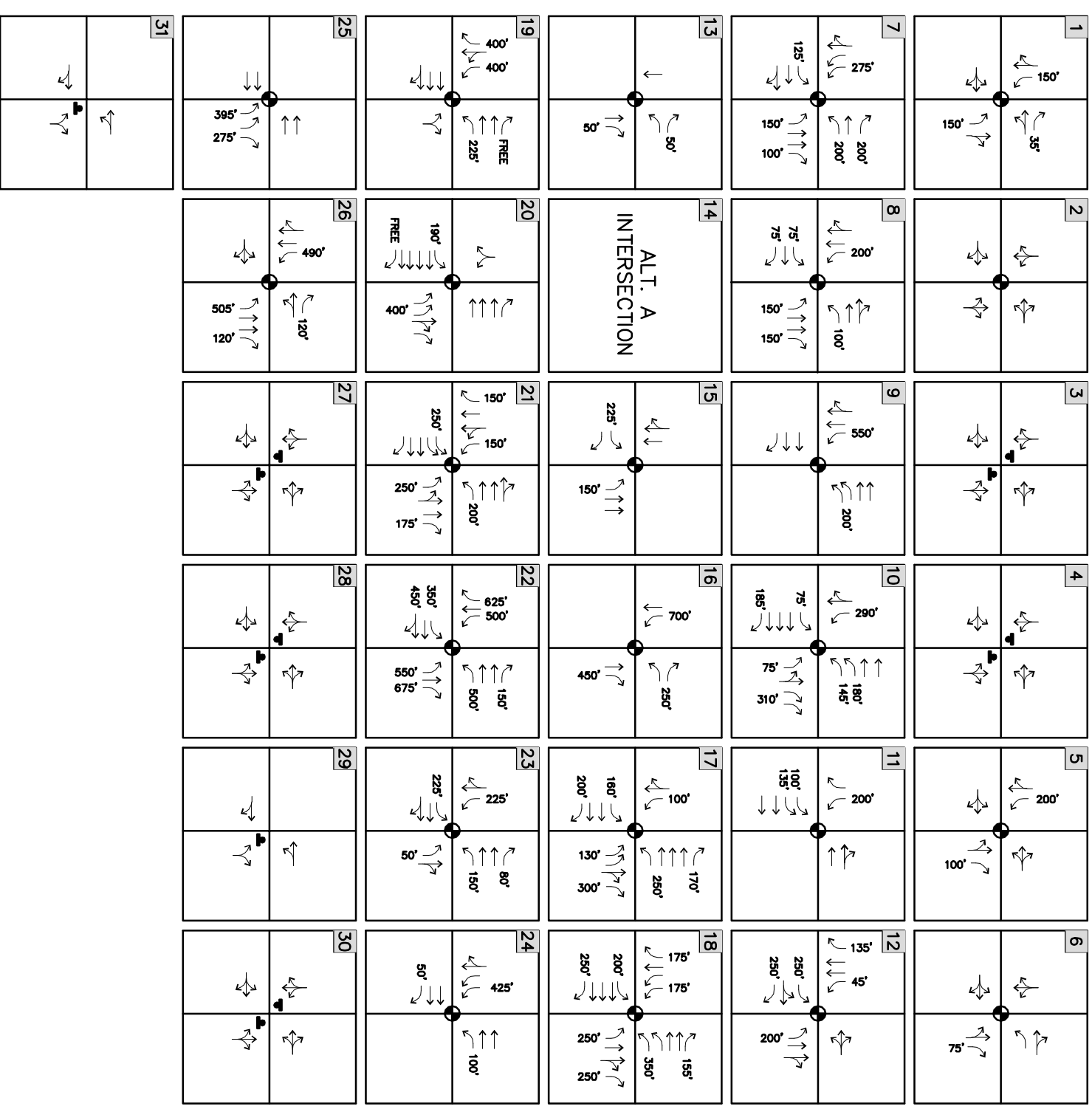
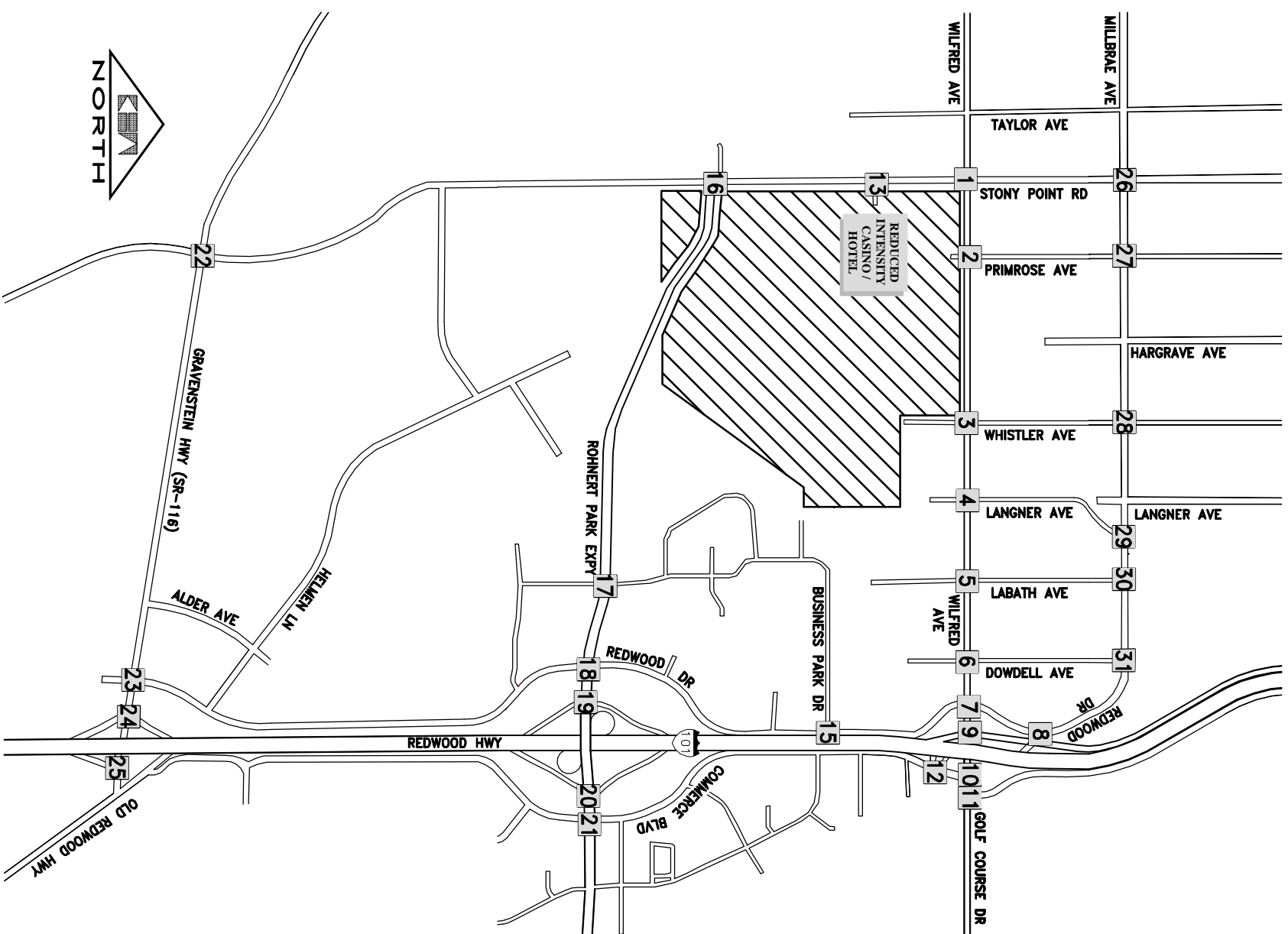
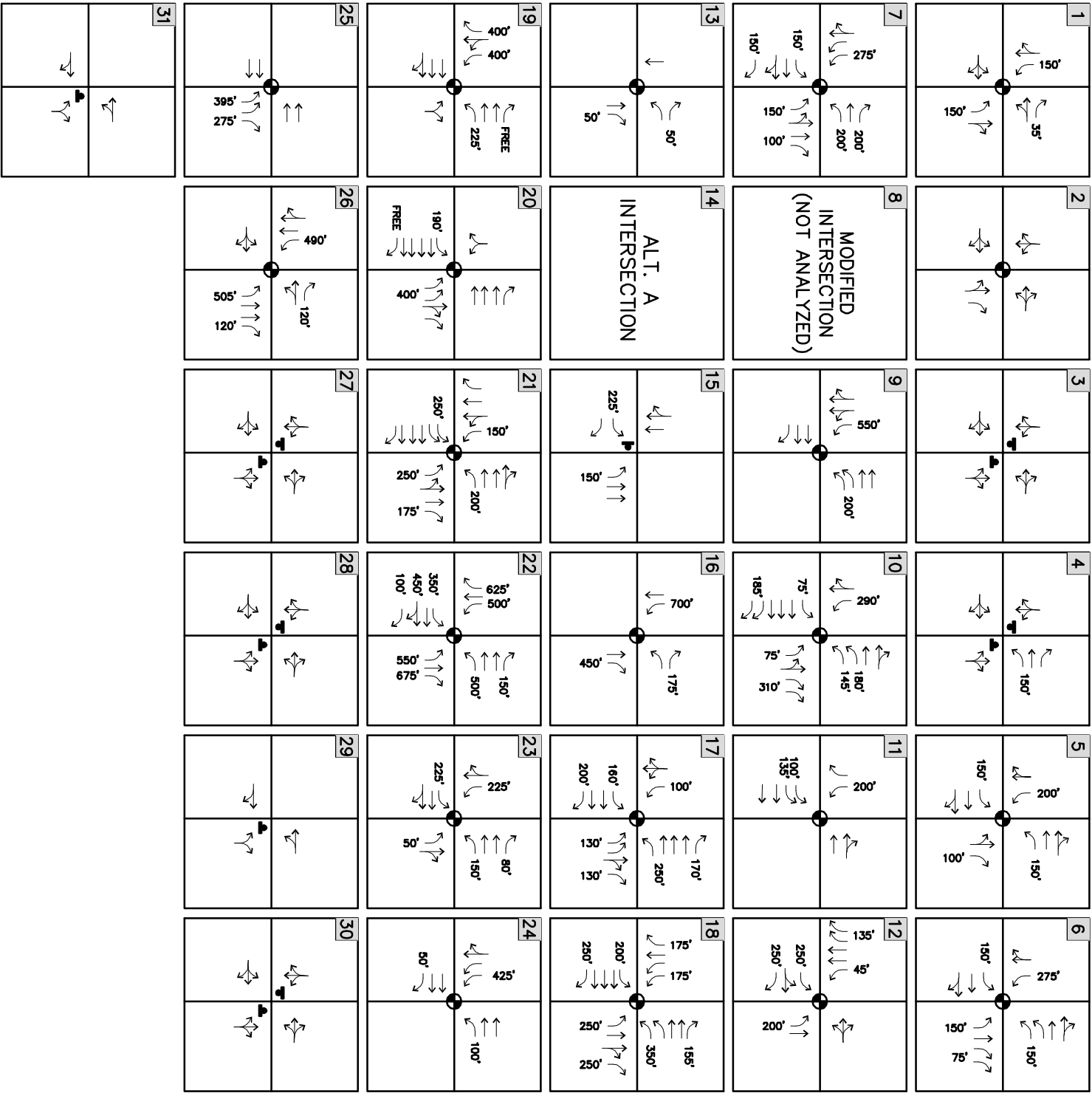
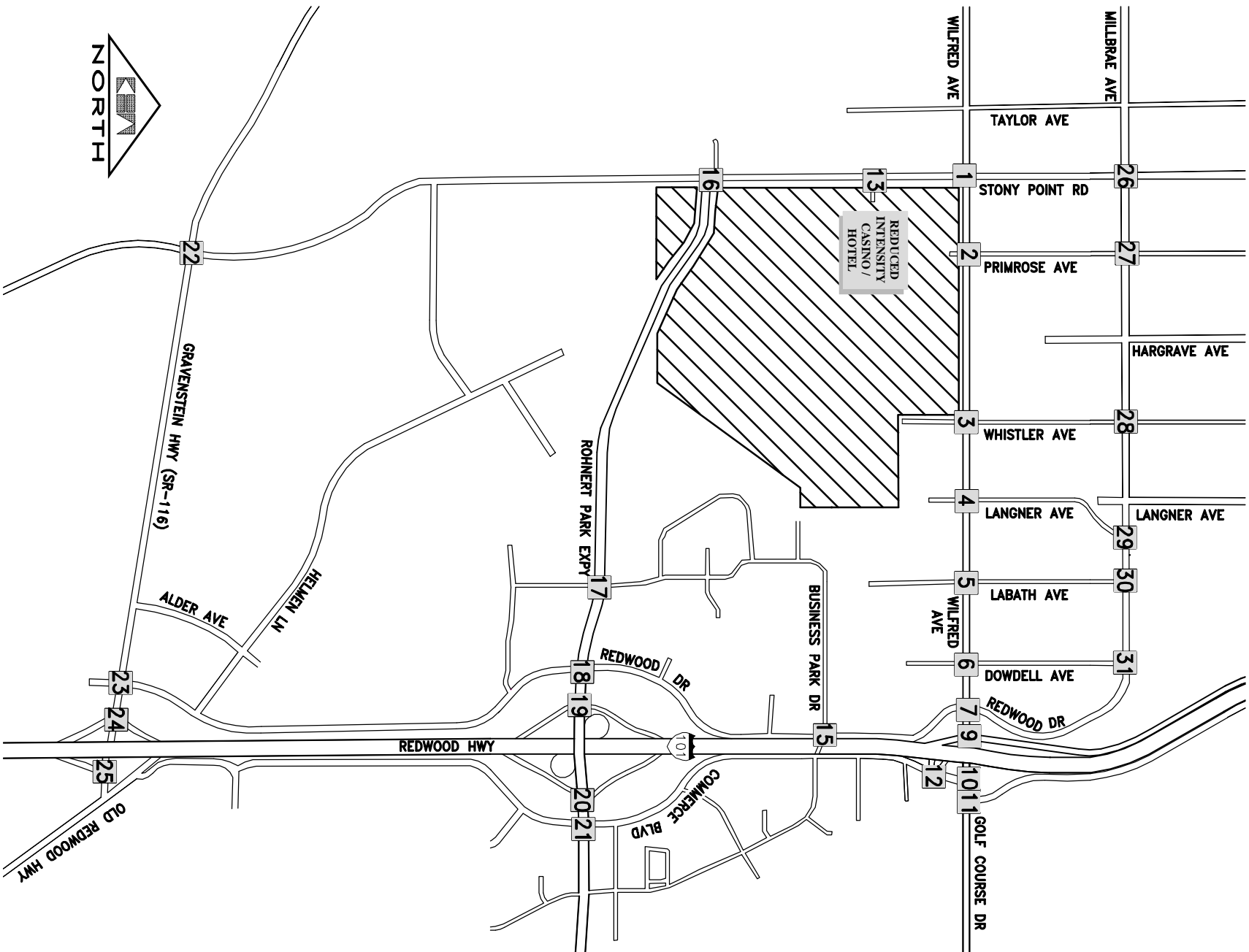


FIGURE D8

Graton Rancheria Alternative D – Rohnert Park, CA

NEAR-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL



Graton Rancheria Alternative D – Rohnert Park, CA

LONG-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE D9

ALTERNATIVE E – NORTHWEST STONY POINT BUSINESS PARK OPTION

The Alternative E business park option is proposed to be located as shown in **Figure E1**, which is bordered by Wilfred Avenue in the north, Rohnert Park Expressway in the south, Stony Point Road in the west, and Langner Avenue in the east.

Figure E2 shows the proposed layout of six buildings and other related facilities located in the northwest corner of the site. The site layout includes approximately 400,000 square feet for light industrial uses and 100,000 square feet for commercial uses. The site plan also shows supporting uses such as parking lots and wastewater treatment facilities.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Site Access

The main project access is from the south side of Wilfred Avenue, where an existing driveway aligns with Primrose Avenue. This approach is assumed to operate as a full movement driveway with no turn limitations.

A second project access from Stony Point Road is located on this plan approximately 880 feet south of the Stony Point Road/Wilfred Avenue intersection. The location is at an existing driveway access; however, due to conflicts with the northbound turn bay at the Stony Point Road/Wilfred Avenue intersection, the access is assumed to be limited to right in/out operation.

Neither access is currently signalized.

Trip Generation – Alternative E

Trip generation was based on rates contained in the Institute of Transportation Engineer’s publication *Trip Generation, 7th Edition*. This manual is a standard reference used by jurisdictions throughout the country and is based on actual trip generation studies at numerous locations in areas of various populations.

Project trip generation for Alternative E is shown in **Table E1**. Additional trip generation calculations are contained in the **Appendix**. Because the project includes light industrial land uses, it is expected to include truck trips. However, no information in ITE *Trip Generation* was available regarding typical truck percentages for Land Use Code

110. Therefore, it was assumed that the trucks associated with the light industrial component of the project would be 10 percent of the total project traffic during the peak hour at the site. It should be noted that depending on the intersection location, the overall truck percentage is lower as project truck trips mix with other background traffic. Thus, the percentage of truck traffic diminishes away from the project site.

Sometimes developments attract trips that are already on the road that stop as they pass by the site. These are not new vehicle trips but are considered to be pass-by trips. Thus, a portion of the commercial trips will be attracted from Stony Point Road and Wilfred Avenue as they pass from their origin to their ultimate destination.

A pass-by reduction was applied to the project trip generation to determine the net new trips expected to be produced by the industrial and commercial center. Pass-by factors were derived from the Institute of Transportation Engineers *Trip Generation Handbook*. It should be noted that pass-by trips do not typically occur with industrial uses; therefore, pass-by rates were only applied to the commercial uses.

As seen in the table the project is expected to generate 471 new trips in the AM and 621 new trips in the PM peak hour. Although project trip generation was prepared for daily, AM, and PM periods, only the weekday PM traffic conditions were evaluated in this report because it represents the time period where the project will contribute to the greatest amount of congestion and potential mitigation. In addition, only PM peak hour future year traffic forecast data was available from the City of Rohnert Park to complete a cumulative traffic analysis of the proposed industrial and commercial development.

Table E 1 – Alternative E Project Trip Generation

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Light Industrial 400,000 s.f.	2,788	324	44	368	47	345	392
Commercial 100,000 s.f.	4,294	63	40	103	180	195	375
Subtotal	7,082	387	84	471	227	540	767
Commercial Pass-by Reduction	N/A	N/A	N/A	N/A	-70	-76	-146
Net New Vehicle Trips	7,082	387	84	471	157	464	621

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to

destinations north of the site, with 20% directed to the Rohnert Park area, and the remaining 50% distributed south of the site. The project traffic distribution is shown in **Figure E3** and **Figure E4**. **Figure E5** illustrates project traffic assigned to the study intersections based on the assumed trip distribution. As seen in **Figure E5**, most of the project traffic is expected to come from the freeway therefore it was assumed that the majority of traffic would use Primrose Avenue because of its closer proximity to the freeway. As noted in the distribution, some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the industrial and commercial project. **Figure E6** illustrates the combined near-term turning movement volumes at the study intersections.

Long -Term Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the industrial and commercial project. **Figure E7** illustrates the combined long-term turning movement volumes at the study intersections.

Alternative E LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions:

- Near-term conditions with Alternative E (year 2008)
- Long-term Cumulative conditions with Alternative E (year 2020)

Results of the analysis are presented in **Table E2**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

Table E 2 – Alternative E Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	F	841.3	F	OVRFL
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	D	27.0	B	12.5	E	40.5
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	C	16.3	B	12.5	C	18.3
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	C	16.2	B	12.5	C	18.2
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	541.2	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	136.1	F	169.9	F	171.1
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	25.8	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	21.6	C	26.8	C	26.2
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	E	77.0	E	74.2	F	84.4
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.5	B	19.0	B	19.3
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	D	52.4	D	50.8	D	48.9
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	C	17.2	A	0.0	C	16.0
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	C	27.2	B	18.5	C	25.5
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	27.0	C	28.2	C	30.4
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	25.7	C	29.1	C	28.5
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.7	B	16.0	B	15.9
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	11.5	B	12.3	B	13.0
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	C	30.8	E	63.4	E	68.8
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	37.4	D	45.5	D	45.6
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	26.7	D	42.4	D	45.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	18.8	B	18.1	B	18.0
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	10.9	B	11.5	B	11.6
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	E	46.0	F	90.2	F	109.6
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.5	B	12.4	B	12.4
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.5	B	12.5	B	12.5
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.7	B	11.7

2008 Results

- Stony Point Road/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

2020 Results

- Stony Point Road/Wilfred Avenue
- Primrose Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

Alternative E Traffic Signal Warrant Analysis

Alternative E, near-term and long-term, traffic volumes at unsignalized study intersections were compared against peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersections will satisfy traffic signal Warrant #3 by the year 2008 and 2020.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Primrose Avenue/Wilfred Avenue (2008 and 2020)
- Labath Avenue/Wilfred Avenue (2008 and 2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Alternative E LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed Alternative E industrial and commercial development were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the industrial and commercial uses. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table E3**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project: however the congestion is reduced as a result of the different land use.

Potential Conflicts with Special Event Traffic

Potential conflicts with special event traffic from nearby performing arts venues will not occur under this Alternative due to the arrival and departure patterns associated with this type of land use. Periods of heavy traffic for the business park will not coincide with those of the performance venues.

Table E 3 – Alternative E Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt E		2020		2020 + Alt E	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	19.6	C	25.6	D	26.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	C	28.0	D	34.1	D	34.8
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	30.0	E	36.1	E	36.7
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	C	23.9	D	32.3	D	37.6
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	29.3	E	37.1	E	37.6
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	D	34.0	C	23.2	E	36.2
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	C	22.5	D	29.0	D	29.5
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	C	22.5	D	29.0	D	29.5
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	C	22.5	D	29.0	D	29.5
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	31.9	E	40.4	E	42.1
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	31.9	E	40.4	E	42.1
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	31.9	E	40.4	E	42.1
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	22.8	D	29.7	F	47.7
Southbound											
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	C	24.4	D	28.5	D	28.8
Santa Rosa Avenue SB On-Ramp	E	D	31.2								
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	D	33.1	F	-	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	39.1	F	44.8	F	45.1
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	38.5	E	39.9	F	43.3
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	38.5	E	39.9	F	43.3
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	38.5	E	39.9	F	43.3
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	32.0	E	38.5	F	39.9
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	31.4	F	37.5	F	39.0
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	C	23.6	E	36.6	E	40.4
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	30.6	F	40.3	F	42.0
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	D	33.7	F	42.3	F	44.2
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	C	23.4	D	32.0	E	35.6

Potential Effects on Intersection Safety

Traffic volumes generated by the project were reviewed in consideration of existing intersection collision history and the potential for increased accidents. According to collision data, accidents involving bicyclist and pedestrians are very low. Many intersections did not report any collisions of this type during the survey period. This suggests that bicycle and pedestrian volumes are relatively low and study intersections have minimal safety hazards for individuals biking or walking. Although the project will introduce increased traffic volumes at some intersections, bicyclists and pedestrians are expected to be able to travel through study intersections with similar levels of safety. Historically casinos do not attract a significant amount of bicycle and pedestrian traffic. . Therefore, the expected amount of pedestrian and bicycle traffic is nominal and a significant increase in bicycle and pedestrian accidents is unlikely.

The potential for increased collisions between motorized vehicles was also considered. Collision frequency and severity are a function of many complex factors that vary depending on the location and type of intersection or roadway segment. Factors include traffic control such as signals or stop signs, lane and shoulder widths, grades, driveway densities, roadside hazards or obstacles, presence of left and right turn lanes, sight distance, congestion, and others.

Because of the number and interrelationships of the variables, accurate crash prediction is difficult. However, the proposed casino and hotel project will increase roadway congestion, a factor which could result in an increase in traffic collisions if left unmitigated. Other factors are expected to remain unaffected.

As noted previously, the purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development. This includes mitigation improvements to restore traffic operations to levels within acceptable standards or to levels as good as or better than without the casino/hotel project. Any potential increases in accidents due to project-related traffic would be offset by the implementation of roadway improvements included as mitigation. Therefore, if mitigations are implemented as proposed in this report, no significant increase in daytime or nighttime collisions is expected.

Potential Effects on Transit

The effect of the industrial/commercial uses on the proposed Sonoma-Marín Area Rail Transit (SMART) was also evaluated. It was determined that because the SMART system will operate during the AM and PM commute hours, some project employees may use the service, if a shuttle is provided between the SMART station and the project. The exact number is unknown but is not anticipated to be greater than for conventional transit. Therefore, the impact of this alternative on the SMART system is determined to be less than significant.

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table E4**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.



Table E 4 – Alternative E Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020
1 Stony Point Road and Wilfred Avenue	EBL			
	EBR			
	WBL			
	WBR	35	OVRFL	OVRFL
	NBL	150	25	25
	NBR			
4 Langner Avenue and Wilfred Avenue	SBL	150	25	25
	SBR			
	EBL			
	EBR			
	WBL	150		25
	WBR			
5 Labath Avenue and Wilfred Avenue	NBL			
	NBR			
	SBL			
	SBR			
	EBL	150		25
	EBR			
6 Dowdell Avenue and Wilfred Avenue	WBL	150		25
	WBR			
	NBL			
	NBR			
	SBL			
	SBR			
7 Redwood Drive and Wilfred Avenue	EBL	150		195
	EBR	150		268
	WBL			
	WBR			
	NBL	150	402	1271
	NBR	100	95	110
8 Redwood Drive and Commerce Boulevard	SBL	275	351	350
	SBR			
	EBL	75	25	
	EBR	75	50	
	WBL	100	25	
	WBR			
9 Wilfred Avenue and SB US 101 Ramps	NBL	150	131	
	NBR	150	25	
	SBL	200	40	
	SBR			
	EBL			
	EBR			
10 Golf Course Drive and Commerce Blvd	WBL	300	40	31
	WBR			
	NBL			
	NBR			
	SBL	250	229	251
	SBR			
11 Roberts Lake Drive and Golf Course Drive	EBL			
	EBR			
	WBL	150	786	1003
	WBR			
	NBL	150	342	411
	NBR			
12 Commerce Blvd and NB US 101 Ramps	SBL	200	94	30
	SBR			
	EBL	80	95	50
	EBR			
	WBL			
	WBR			
15 Business Park Drive and Redwood Drive	NBL			
	NBR			
	SBL	200	76	83
	SBR			
	EBL	250	168	204
	EBR	250	25	25
16 Stony Point Road and Rohnert Park Expy	WBL	200	578	524
	WBR			
	NBL	200		
	NBR			
	SBL	100	25	25
	SBR	175	107	142
17 Labath Avenue and Rohnert Park Expy	EBL	225	97	40
	EBR			
	WBL			
	WBR			
	NBL	150	25	25
	NBR			
18 Redwood Drive and Rohnert Park Expy	SBL			
	SBR			
	EBL			
	EBR			
	WBL			
	WBR			
19 SB US 101 Ramps and Rohnert Park Expy	NBL			
	NBR			
	SBL			
	SBR			
	EBL			
	EBR			
20 NB US 101 Ramps and Rohnert Park Expy	WBL	225	71	71
	WBR			
	NBL			
	NBR			
	SBL	400	318	238
	SBR	400	209	255
21 Commerce Blvd and Rohnert Park Expy	EBL	190	25	25
	EBR			
	WBL			
	WBR			
	NBL			
	NBR			
22 Stony Point Road and Gravenstein Hwy	SBL			
	SBR			
	EBL	250	87	66
	EBR			
	WBL	200	187	222
	WBR			
23 Redwood Road and Gravenstein Hwy	NBL	250	210	214
	NBR	175	56	58
	SBL	150	98	158
	SBR	150	51	47
	EBL	350	162	183
	EBR			
24 Gravenstein Hwy and SB US 101 Ramps	WBL	500	155	170
	WBR	150	37	39
	NBL	550	296	298
	NBR	675	30	31
	SBL	500	161	176
	SBR	625	49	54
25 Gravenstein Hwy and NB US 101 Ramps	EBL	225	161	194
	EBR			
	WBL	150	69	58
	WBR	80	25	111
	NBL	50	65	65
	NBR			
26 Stony Point Road and Millbrae Avenue	SBL	225	388	556
	SBR			
	EBL			
	EBR			
	WBL			
	WBR			
27 Stony Point Road and Millbrae Avenue	NBL			
	NBR			
	SBL	425	222	222
	SBR			
	EBL			
	EBR			
28 Stony Point Road and Millbrae Avenue	WBL			
	WBR			
	NBL	395	129	131
	NBR	275	178	205
	SBL			
	SBR			
29 Stony Point Road and Millbrae Avenue	EBL			
	EBR			
	WBL			
	WBR	120	38	126
	NBL	505	25	25
	NBR	120	25	25
30 Stony Point Road and Millbrae Avenue	SBL	490	25	25
	SBR			
	EBL			
	EBR			
	WBL			
	WBR			

Alternative E Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Alternative E traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown in **Table E5** are needed in the near-term (2008) and long-term (2020).

The basis of the Alternative E mitigations is the assumption that intersection #13, the Project Driveway at Stony Point Road, should be relocated further south along Stony Point Road and be signalized so that it can function as a full movement access. This change permits more project traffic to conveniently arrive and exit from the site and use the Rohnert Park Expressway interchange, thus relieving some the traffic pressure through the Wilfred Avenue interchange.

In the event that intersection #13 cannot be relocated and signalized as discussed above, additional mitigation improvements will be needed, particularly at intersections surrounding the Wilfred Avenue interchange. The project will create a significant unavoidable impact at the intersection of Golf Course Drive/Commerce Boulevard regardless of whether intersection #13 is relocated.

Table E6 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections.

Figures E8 and E9 illustrate the mitigated lane geometry and traffic control.

A single asterisk in the table denotes an intersection that operates at an acceptable level of service and does not require mitigation, but a mitigated level of service and delay are provided for reference as a result of the mitigation to signalize the Project Driveway/ Stony Point Road which changes traffic patterns at some intersections. A double asterisk indicates an intersection where the delay increases as a result of the mitigation to signalize the Project Driveway/Stony Point Road intersection.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue. The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to the Urban Growth Boundary. From Langner Avenue west to Stony Point Road, Wilfred Avenue should be three lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and should include Class II bike lanes out to Stony Point Road to



connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Stony Point Road, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

**Table E 5 – Alternative E Summary of Mitigations**

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	1	Stony Point Rd/ Wilfred Ave	• Signalize	No	Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	• Signalize	No	Capacity
	6	Dowdell Ave/ Wilfred Ave	• Signalize	No	Capacity
	7	Redwood Dr/ Wilfred Ave	• Add EB right and change EB all-shared to left-through • Change WB left-through to through • Change phasing east-west to protected & permitted from split	Yes No No	Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	No mitigation necessary	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	• Add an EB right overlap phase	No	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	No mitigation necessary	-	-
	13	Project Driveway/ Stony Point Rd	• Signalize • Add NB right and change NB through-right to through • Add WB left out of project driveway	No Tribe land Tribe land	Capacity Capacity Capacity
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	No mitigation necessary	-	-
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Add a second NB left turn lane	Yes	Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	No mitigation necessary	-	-
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-



Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	1	Stony Point Rd/ Wilfred Ave	• Signalize *	No	Capacity
	2	Primrose Ave/ Wilfred Ave	• Signalize	No	Capacity
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	• Signalize *	No	Capacity
	6	Dowdell Ave/ Wilfred Ave	• Signalize * • Add SB left and change SB all shared to through-right • Add a second WB left • Add a NB left and NB right and change NB all shared to through-right	No Yes Yes Yes	Capacity Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	• Change WB left-through to through * • Change NB through to through-left and change north-south phasing to split from protected • Change phasing east-west to protected from split * • Optimize signal timing	No No No No	Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	Modified Intersection (not analyzed)	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	• Add an EB right overlap phase * • Unavoidable Significant Impact	No	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	No mitigation necessary	-	-
	13	Project Driveway/ Stony Point Rd	• Signalize * • Add NB right and change NB through-right to through * • Add WB left out of project driveway *	No Tribe land Tribe land	Capacity Capacity Capacity
	14	Business Park Dr/ Labath Ave	Alternative A intersection	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	No mitigation necessary	-	-
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Add a second NB left turn lane *	Yes	Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	• Optimize signal timing • Add a third EB through lane that merges back into 2 lanes east of the intersection	No Yes	Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize *	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

* Improvement assumed to occur with 2008 mitigation

Table E 6 – Alternative E Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008						2020					
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	B	17.5	F	841.3	F	OVRFL	C	20.2
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	D	27.0	C	19.4 *	B	12.5	E	40.5	A	8.5
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	C	16.3	C	16.3	B	12.5	C	18.3	C	18.3
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	C	16.2	C	16.2	B	12.5	C	18.2	C	19.3
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	541.2	C	34.0	F	OVRFL	F	OVRFL	C	31.9
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	OVRFL	C	21.0	F	OVRFL	F	OVRFL	D	35.8
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	136.1	D	51.1	F	169.9	F	171.1	D	45.5
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	25.8	C	26.5	-	-	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	21.6	C	21.7 *	C	26.8	C	26.2	C	22.0
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	E	77.0	D	43.7	E	74.2	F	84.4	E	55.3
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	18.5	B	18.4 **	B	19.0	B	19.3	B	19.4
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	D	52.4	D	47.4	D	50.8	D	48.9	D	43.1
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	C	17.2	A	6.9	A	0.0	C	16.0	A	6.7
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	D	27.5	C	16.7	C	16.7	C	16.7
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	C	27.2	C	27.2	B	18.5	C	25.5	C	25.5
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	27.0	C	27.0	C	28.2	C	30.4	C	30.4
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	25.7	C	25.7	C	29.1	C	28.5	C	29.0
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.7	B	17.8	B	16.0	B	15.9	B	17.2
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	11.5	A	8.7	B	12.3	B	13.0	B	10.5
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	C	30.8	C	33.5	E	63.4	E	68.8	C	31.3
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	37.4	D	37.4	D	45.5	D	45.6	D	45.6
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	26.7	C	26.7	D	42.4	D	45.8	D	45.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	18.8	B	18.8	B	18.1	B	18.0	B	18.0
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	10.9	B	10.9	B	11.5	B	11.6	B	11.6
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	E	46.0	B	10.0	F	90.2	F	109.6	B	10.5
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.5	B	11.5	B	12.4	B	12.4	B	11.8
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.5	B	11.5	B	12.5	B	12.5	B	12.5
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	A	9.9	A	9.9	B	11.3	B	11.3	B	11.3
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	11.7	B	14.7	B	14.7	B	14.7
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.4	B	11.7	B	11.7	B	11.7

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table E7**:

- Adjust the ramp metering to account for the additional project traffic at the Wilfred Avenue interchange in the long-term (2020). Most metering adjustments can be minor and are not expected to have queuing effects on the local street network. However, the southbound on-ramp will require heavy metering to obtain an acceptable level of service for the freeway ramp merge area which may create a long queue backed up on the ramp.
- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Wilfred Avenue and from Gravenstein Highway (SR-116) to West Sierra Avenue in the long-term (2020).

Aside from roadway improvements to mitigate protect impacts, the industrial/commercial project should provide a shuttle that serves the two Rohnert Park transfer stations and the SMART rail station. The shuttle should run throughout the day.

Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

It is recommended that the casino help contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

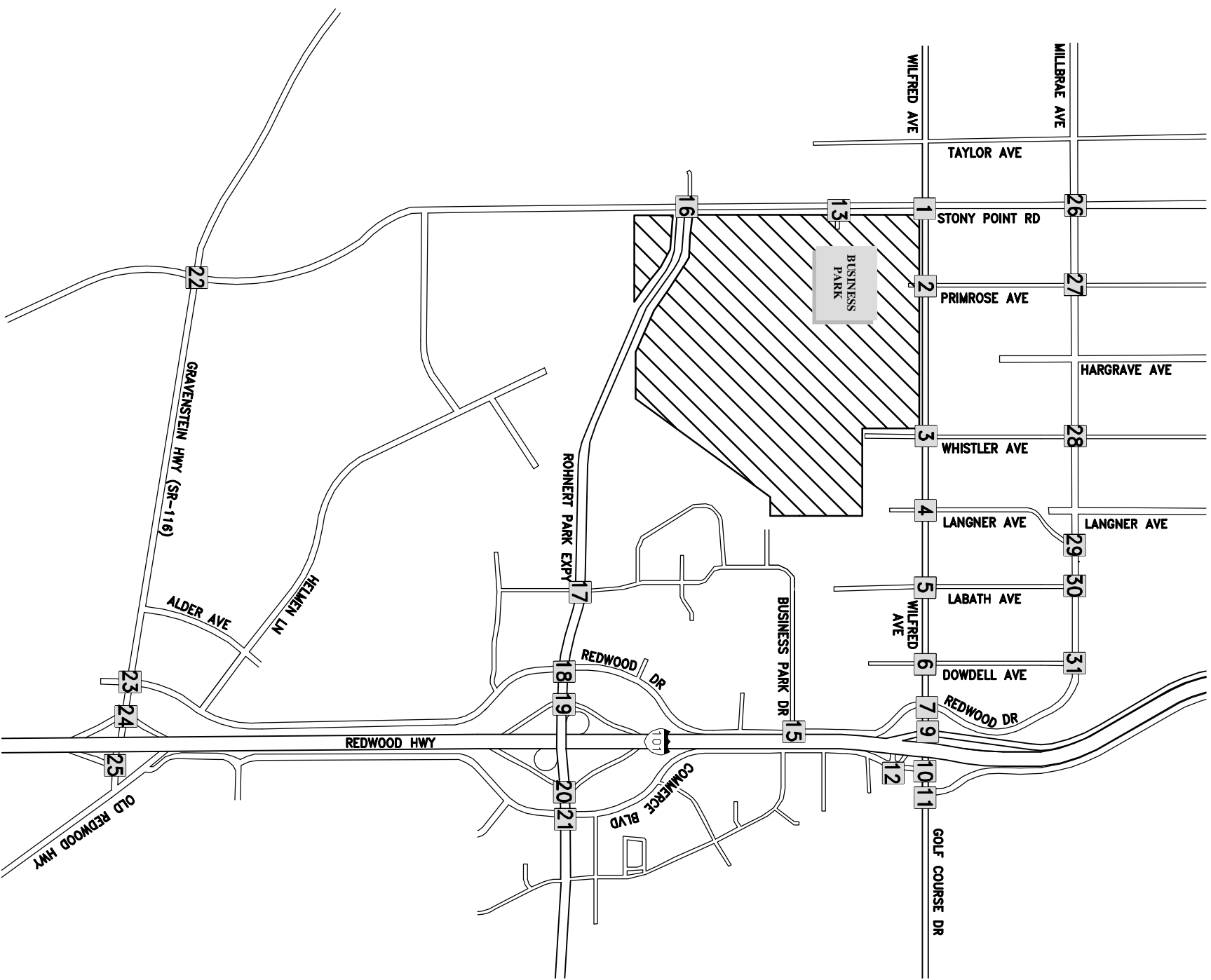
It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating or shortening the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.

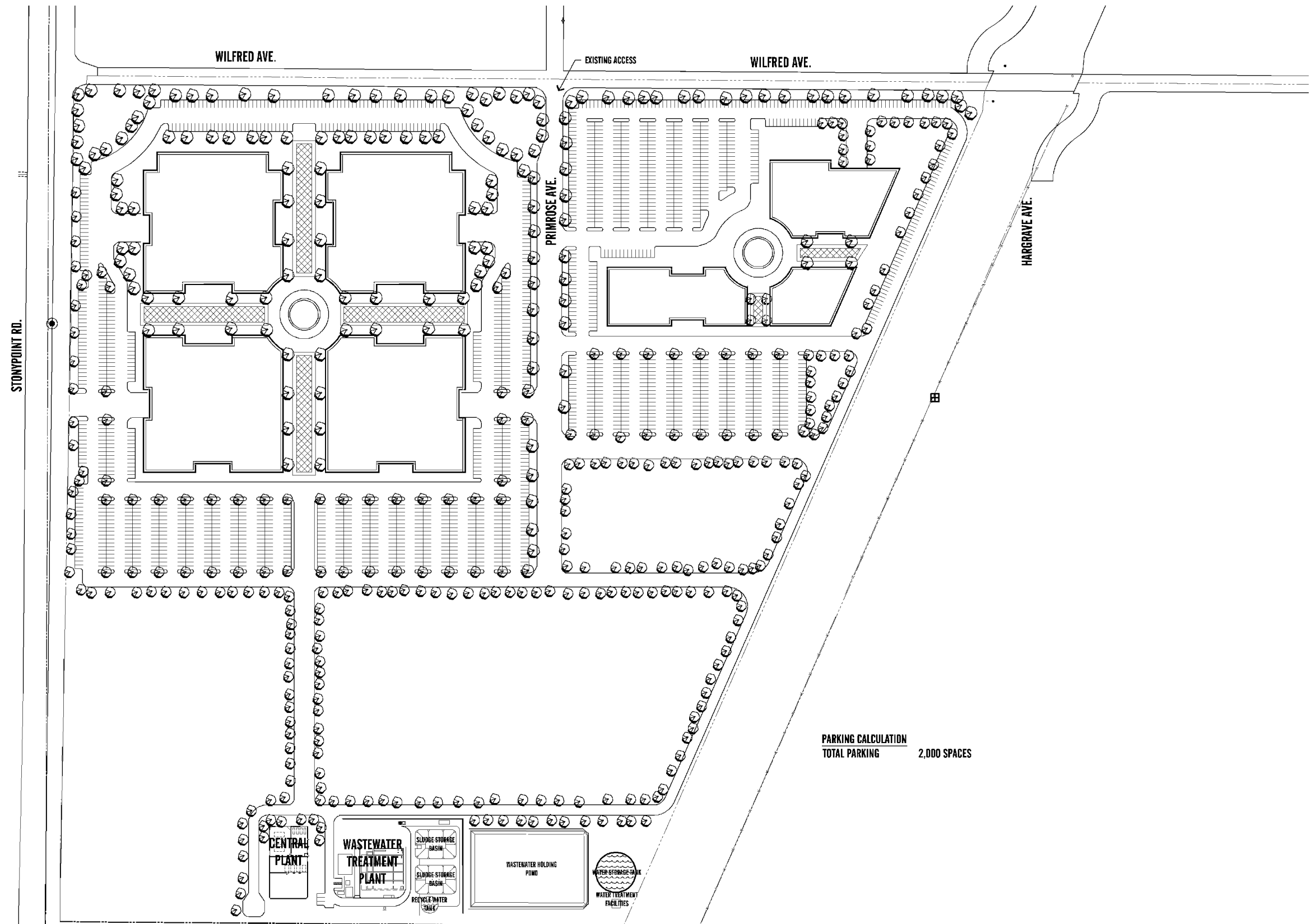
Table E 7 – Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt E		2020		2020 + Alt E		2020 + Alt E Mitigated	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound													
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	19.6	C	25.6	D	26.4	D	26.4
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	C	28.0	D	34.1	D	34.8	D	34.8
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	30.0	E	36.1	E	36.7	D	33.3
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	C	23.9	D	32.3	D	37.6	D	33.3
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	29.3	E	37.1	E	37.6	D	33.3
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	D	34.0	C	23.2	E	36.2	E	36.2
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	C	22.5	D	29.0	D	29.5	D	29.5
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	C	22.5	D	29.0	D	29.5	D	29.5
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	C	22.5	D	29.0	D	29.5	D	29.5
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	31.9	E	40.4	E	42.1	E	42.1
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	31.9	E	40.4	E	42.1	E	42.1
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	31.9	E	40.4	E	42.1	E	42.1
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	22.8	D	29.7	D	31.0	D	31.0
Southbound													
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	C	24.4	D	28.5	D	28.8	D	28.8
Santa Rosa Avenue SB On-Ramp	E	D	31.2	/	/	/	/	/	/	/	/	/	/
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	D	33.1	F	-	F	-	C	23.6
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	39.1	F	44.8	F	45.1	D	64.0
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	38.5	E	39.9	F	43.3	E	42.7
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	38.5	E	39.9	F	43.3	E	42.7
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	38.5	E	39.9	F	43.3	E	42.7
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	32.0	E	38.5	F	39.9	E	36.2
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	31.4	F	37.5	F	39.0	E	36.2
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	C	23.6	E	36.6	E	40.4	E	36.2
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	30.6	F	40.3	F	42.0	E	36.2
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	D	33.7	F	42.3	F	44.2	C	26.9
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	C	23.4	D	32.0	E	35.6	E	35.6



Graton Rancheria Alternative E – Rohnert Park, CA

FIGURE E1

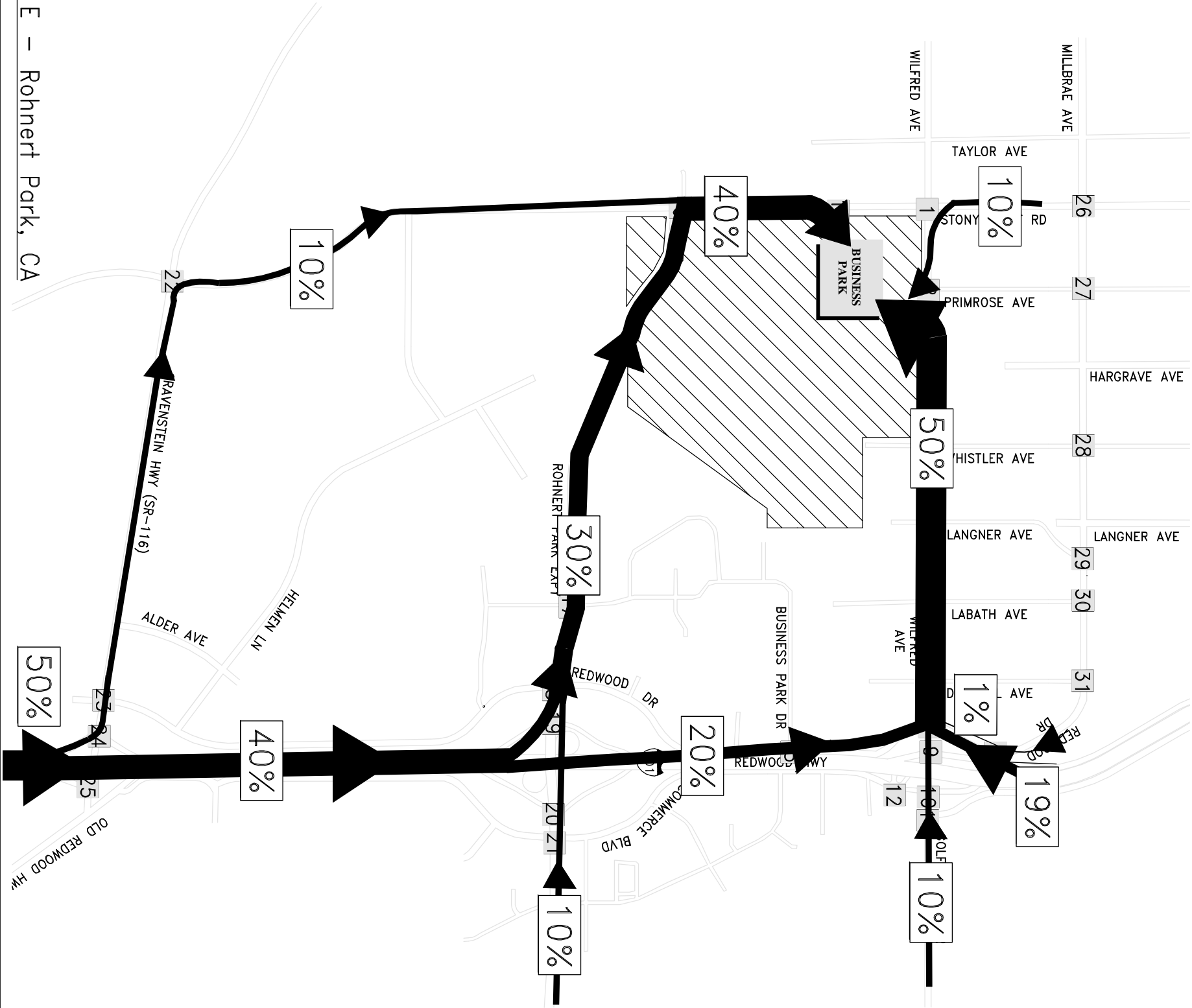


Graton Rancheria Alternative E – Rohnert Park, CA

SITE PLAN

FIGURE E2

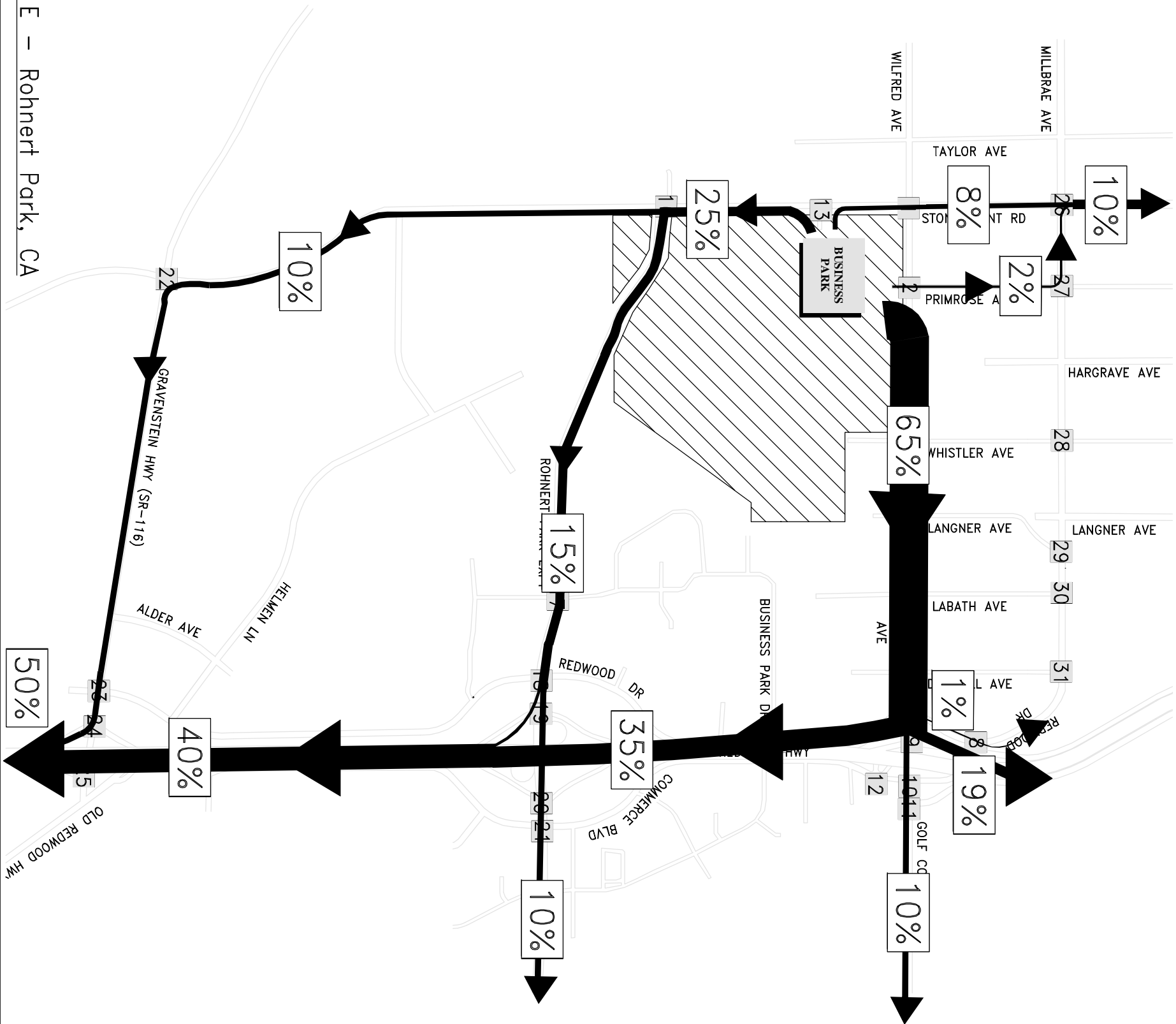




Graton Rancheria Alternative E - Rohnert Park, CA

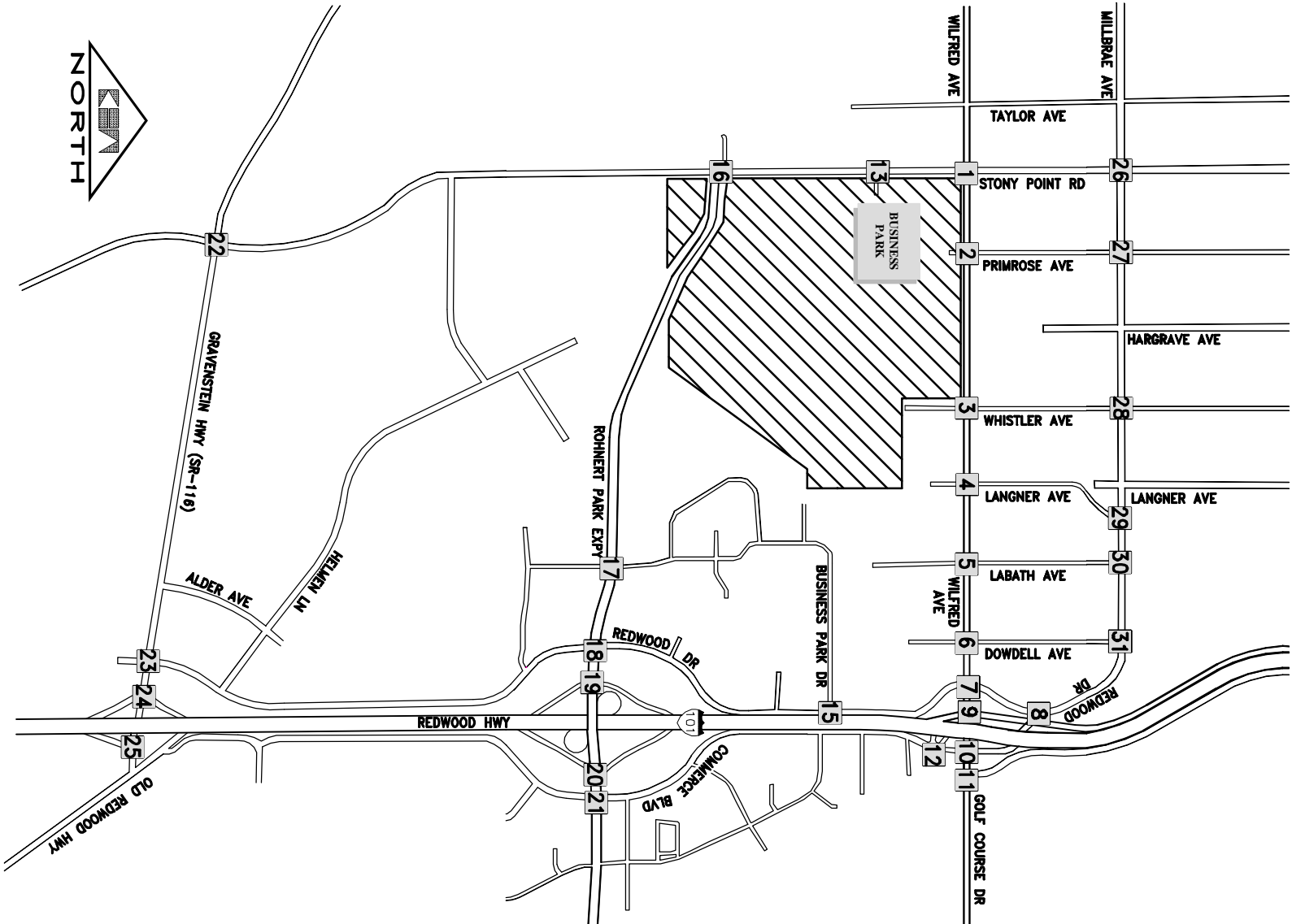
TRIP DISTRIBUTION - IN

FIGURE E3



Graton Rancheria Alternative E – Rohnert Park, CA

FIGURE E4



<div>1</div> <div><div></div><div>16</div><div>←116</div><div>37→</div></div>	<div>2</div> <div><div></div><div>16</div><div>←79</div><div>116→</div><div>116→</div><div>36→</div></div>	<div>3</div> <div><div></div><div>←79</div><div>302→</div></div>	<div>4</div> <div><div></div><div>←79</div><div>302→</div></div>	<div>5</div> <div><div></div><div>←79</div><div>302→</div></div>	<div>6</div> <div><div></div><div>←79</div><div>302→</div></div>
<div>7</div> <div><div>2</div><div>←77</div><div>5</div><div>297→</div></div>	<div>8</div> <div><div>2</div><div>←</div><div>5</div><div>→</div></div>	<div>9</div> <div><div>98</div><div>←47</div><div>135</div><div>182→</div></div>	<div>10</div> <div><div></div><div>←16</div><div>46</div><div>88→</div><div>15</div><div>←</div></div>	<div>11</div> <div><div></div><div>←16</div><div>46</div><div>→</div></div>	<div>12</div> <div><div>88</div><div>←</div><div>31</div><div>→</div></div>
<div>13</div> <div><div></div><div>←37</div><div>116</div><div>←</div><div>88</div><div>←</div></div>	<div>14</div> <div>ALT. A INTERSECTION</div>	<div>15</div> <div><div></div><div></div></div>	<div>16</div> <div><div>46</div><div>70</div><div>←47</div><div>16</div><div>→</div></div>	<div>17</div> <div><div></div><div>←47</div><div>70</div><div>→</div></div>	<div>18</div> <div><div></div><div>←47</div><div>70</div><div>→</div></div>
<div>19</div> <div><div></div><div>←47</div><div>46</div><div>23</div><div>→</div></div>	<div>20</div> <div><div></div><div>←16</div><div>46</div><div>31</div><div>→</div></div>	<div>21</div> <div><div></div><div>←16</div><div>46</div><div>→</div></div>	<div>22</div> <div><div></div><div>←16</div><div>46</div><div>→</div></div>	<div>23</div> <div><div></div><div>←16</div><div>46</div><div>→</div></div>	<div>24</div> <div><div></div><div>←16</div><div>46</div><div>←</div></div>
<div>25</div> <div><div></div><div></div><div>16</div><div>←</div></div>	<div>26</div> <div><div></div><div>←9</div><div>16</div><div>←</div><div>37</div><div>→</div></div>	<div>27</div> <div><div></div><div></div><div>9</div><div>←</div></div>	<div>28</div> <div><div></div><div></div></div>	<div>29</div> <div><div></div><div></div></div>	<div>30</div> <div><div></div><div></div></div>
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LEGEND

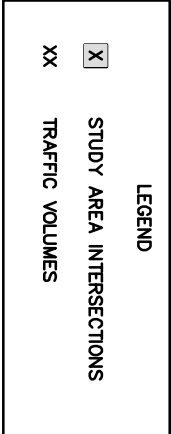
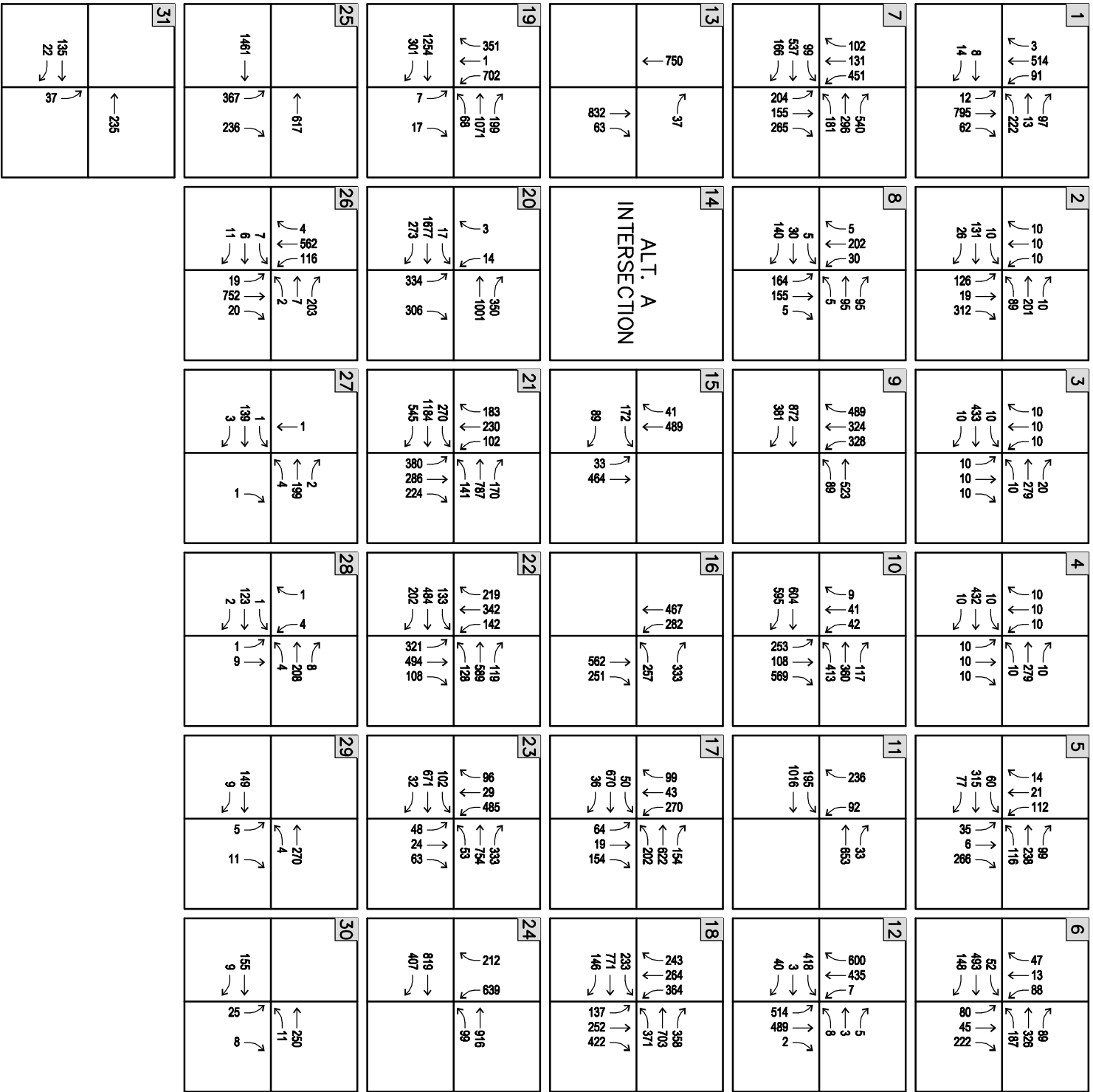
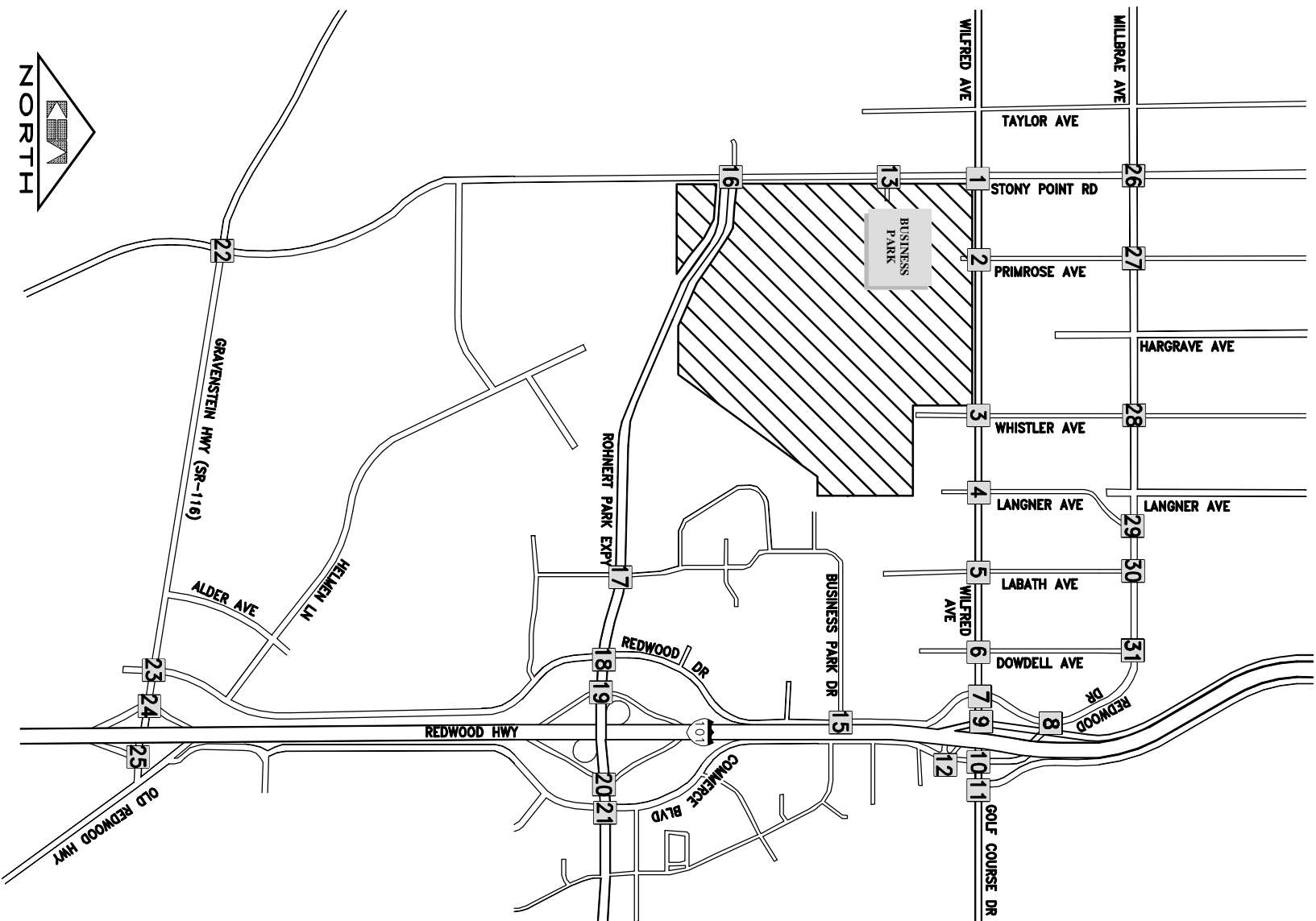
X

STUDY AREA INTERSECTIONS

XXTRAFFIC VOLUMES

Graton Rancheria Alternative E – Rohnert Park, CA

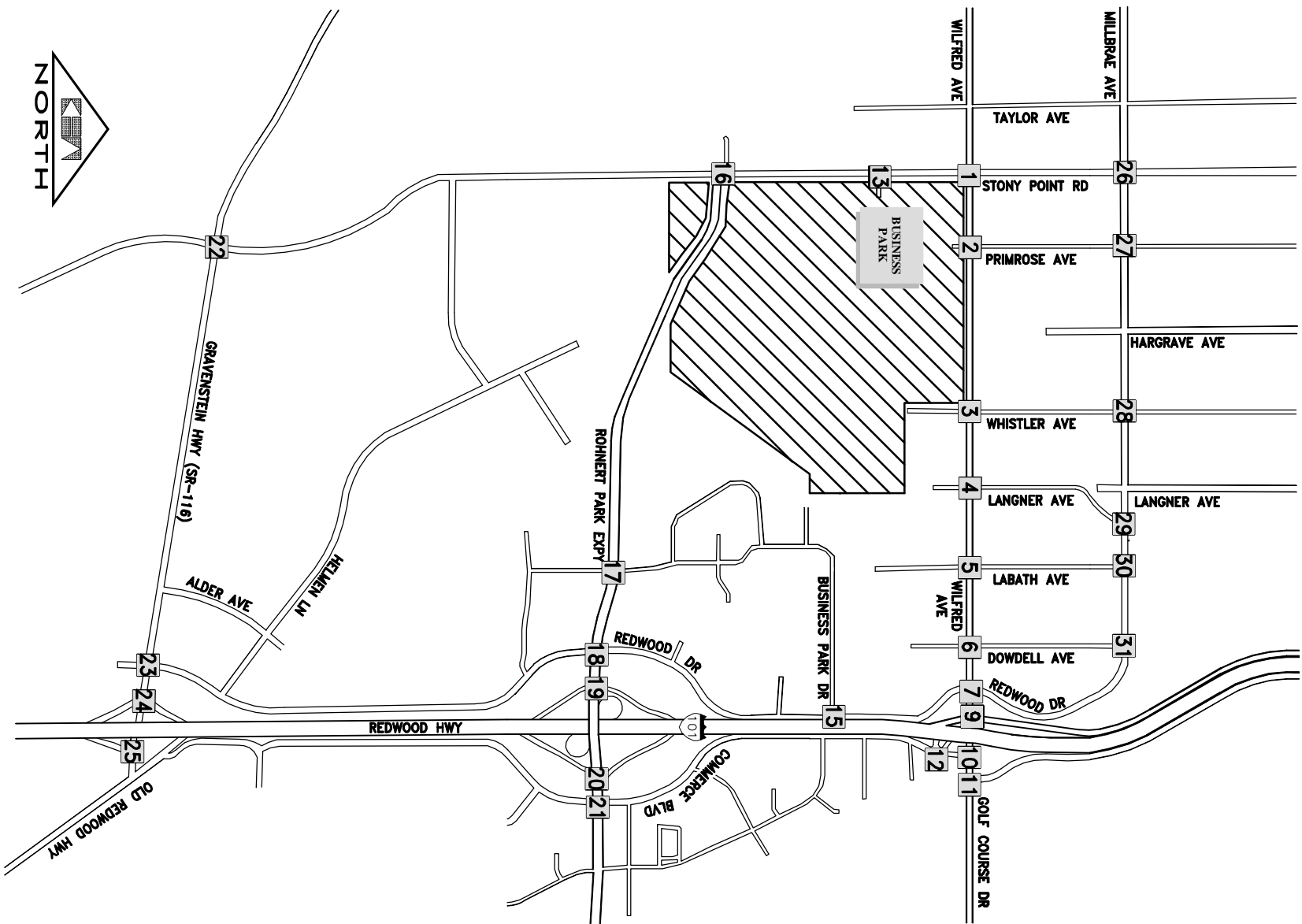
FIGURE E5



Graton Rancheria Alternative E - Rohnert Park, CA

FIGURE E6

NEAR-TERM + PROJECT PM TRAFFIC VOLUMES



1	2	3	4	5	6
<div><div>134</div><div>508 118</div><div>13 16</div><div>13 14</div><div>74 74</div></div>	<div><div>280</div><div>9 88</div><div>10 28</div><div>170 92</div><div>25 25</div></div>	<div><div>359</div><div>9 9</div><div>10 10</div><div>472 91</div><div>9 9</div></div>	<div><div>359</div><div>9 9</div><div>10 10</div><div>472 91</div><div>9 9</div></div>	<div><div>189</div><div>11 13</div><div>40 41</div><div>41 41</div><div>77 96</div></div>	<div><div>273</div><div>19 41</div><div>63 27</div><div>61 43</div><div>509 88</div></div>
7	8	9	10	11	12
<div><div>730</div><div>224 453</div><div>151 1031</div><div>255 255</div><div>73 93</div></div>	<div><div>MODIFIED INTERSECTION (NOT ANALYZED)</div></div>	<div><div>882 556</div><div>152 445</div><div>1392 77</div><div>729 77</div></div>	<div><div>459</div><div>9 17</div><div>805 942</div><div>98 175</div><div>499 499</div></div>	<div><div>64</div><div>103 102</div><div>137 1251</div><div>871 871</div></div>	<div><div>5</div><div>928 616</div><div>504 3</div><div>47 2</div><div>5 8</div></div>
13	14	15	16	17	18
<div><div>780</div><div>37 92</div><div>76 92</div></div>	<div><div>ALT. A INTERSECTION</div></div>	<div><div>52 36</div><div>144 31</div><div>14 12</div><div>356 356</div></div>	<div><div>264</div><div>506 275</div><div>253 592</div><div>253 592</div></div>	<div><div>92</div><div>16 92</div><div>65 53</div><div>539 116</div></div>	<div><div>318</div><div>236 339</div><div>216 770</div><div>183 183</div><div>318 650</div></div>
19	20	21	22	23	24
<div><div>427 611</div><div>255 908</div><div>1288 320</div><div>6 17</div></div>	<div><div>3</div><div>14 383</div><div>21 1602</div><div>298 270</div><div>5 5</div></div>	<div><div>52 179</div><div>235 462</div><div>202 185</div><div>126 126</div></div>	<div><div>129</div><div>25 151</div><div>149 383</div><div>129 129</div></div>	<div><div>406</div><div>11 28</div><div>122 754</div><div>82 82</div></div>	<div><div>82</div><div>32 82</div><div>63 459</div><div>82 1014</div></div>
25	26	27	28	29	30
<div><div>683</div><div>1586 391</div><div>273 273</div></div>	<div><div>228</div><div>5 25</div><div>11 8</div><div>79 79</div></div>	<div><div>2</div><div>1 265</div><div>1 7</div><div>2 2</div></div>	<div><div>8</div><div>1 279</div><div>1 4</div><div>1 6</div></div>	<div><div>331</div><div>154 27</div><div>27 92</div></div>	<div><div>225</div><div>160 23</div><div>114 9</div></div>
31					
<div><div>235</div><div>131 51</div><div>55 55</div></div>					

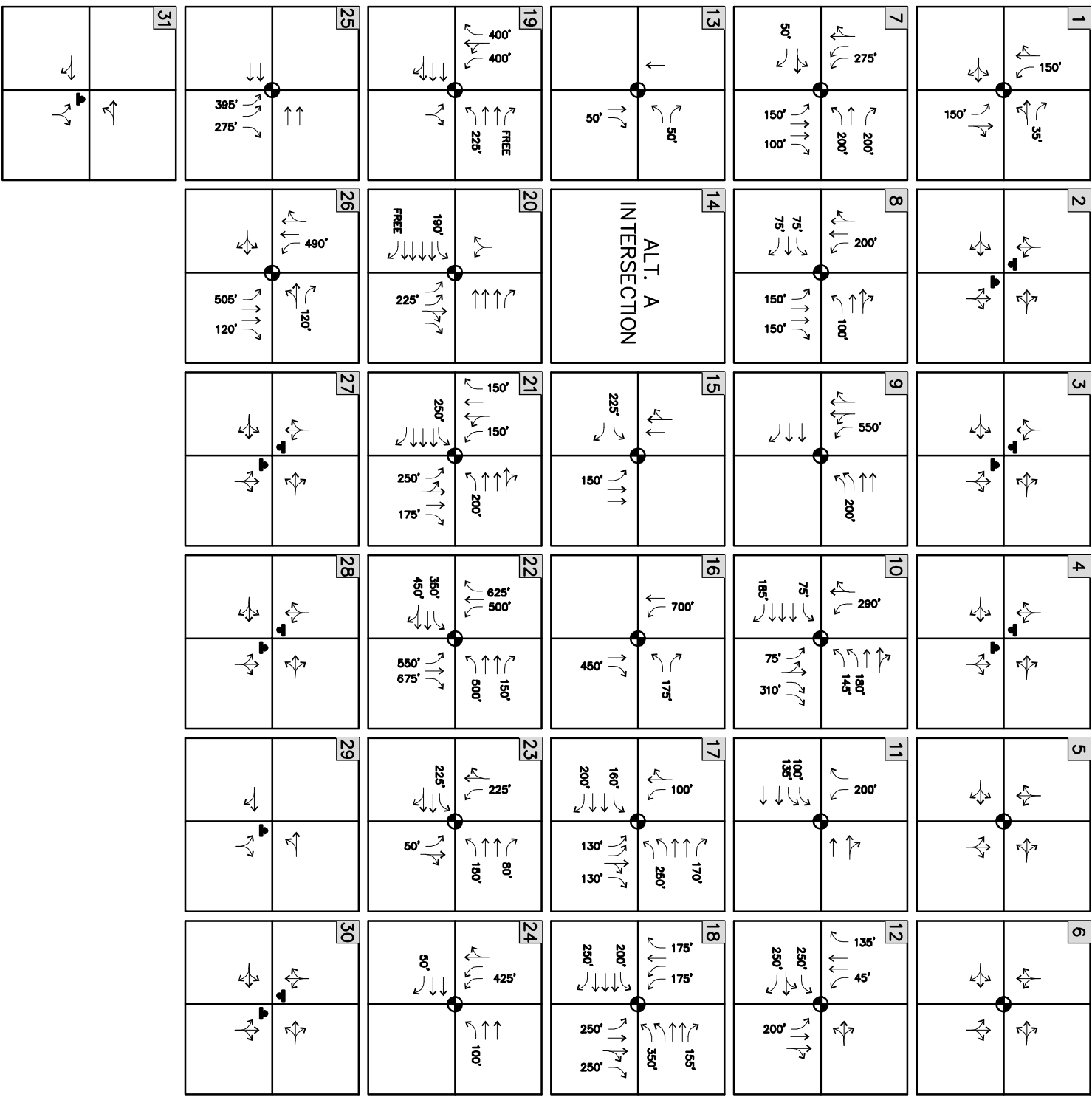
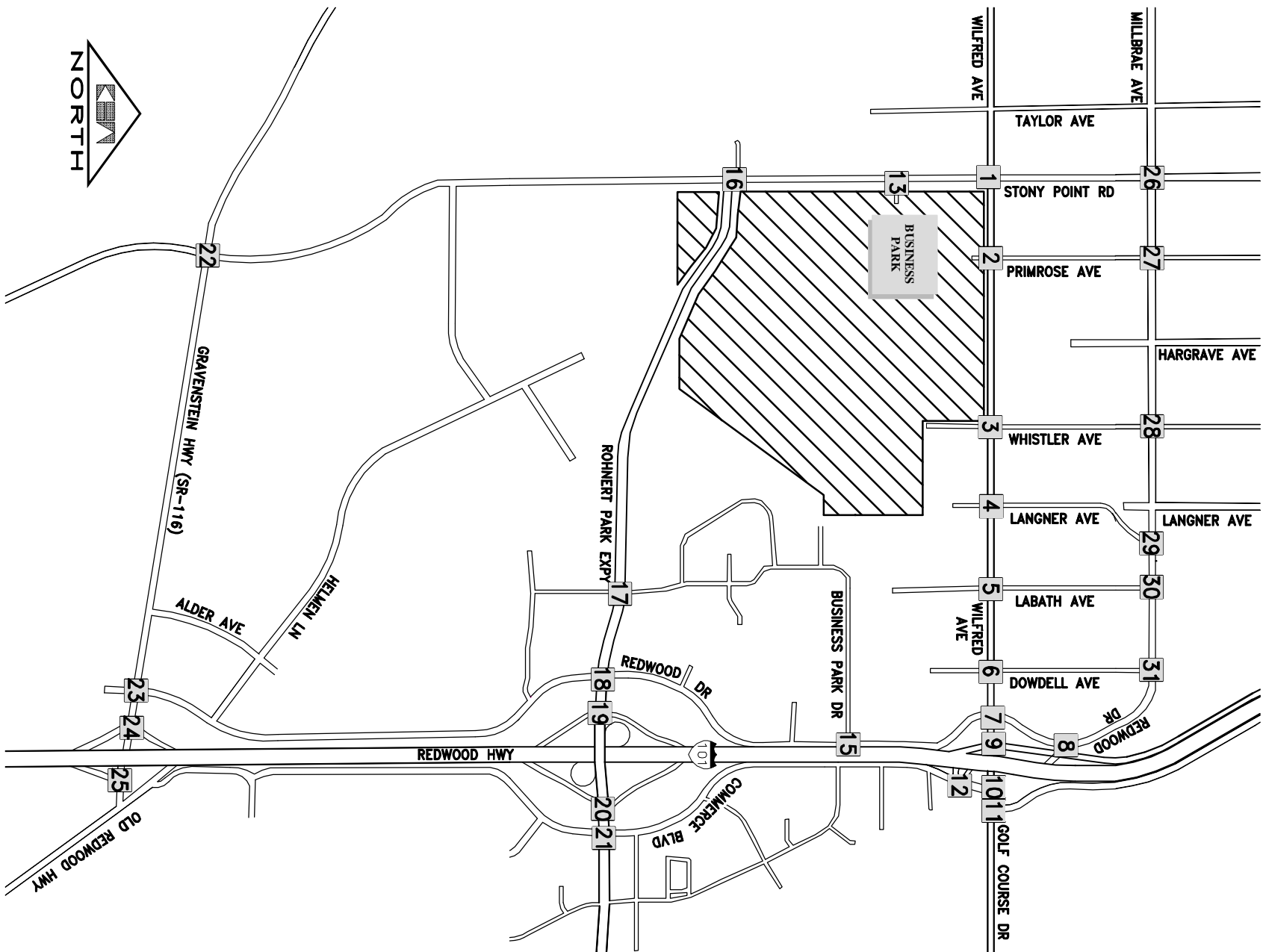
LEGEND

X

STUDY AREA INTERSECTIONS

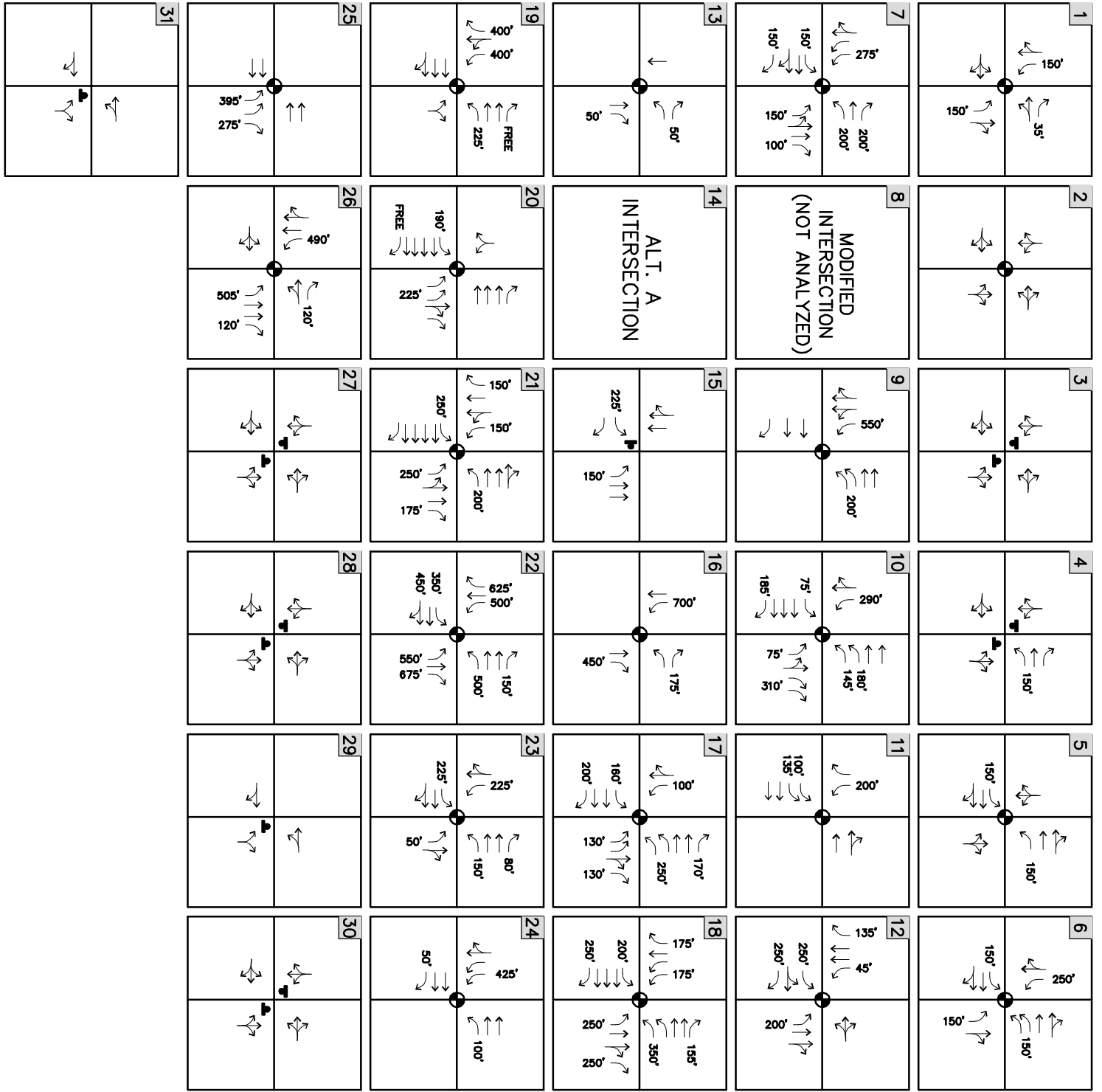
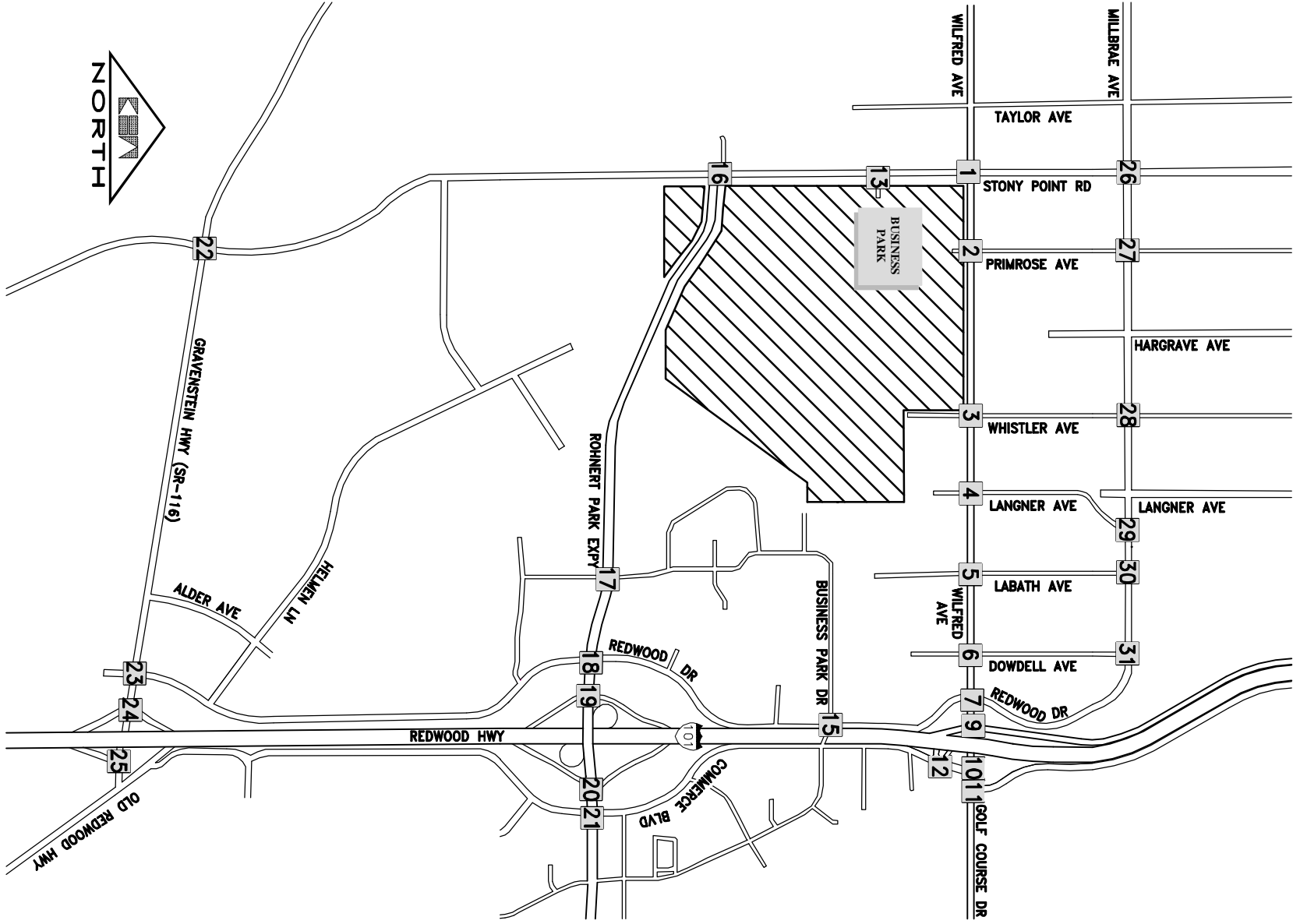
XXTRAFFIC VOLUMES

FIGURE E7



Graton Rancheria No Project – Rohnert Park, CA

NEAR-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL



Graton Rancheria No Project – Rohnert Park, CA

LONG-TERM MITIGATED LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE E9

ALTERNATIVE H – WILFRED AVENUE SITE REDUCED INTENSITY OPTION

The Alternative H casino and hotel is proposed to be located as shown in **Figure H1**, which is bordered by Wilfred Avenue in the north, Business Park Drive in the south, Langner Avenue in the west, and Dowdell Avenue in the east.

Figure H2 shows the proposed layout of the casino and hotel facility. The site layout includes a main building of approximately 315,100 square feet for a casino, restaurants, food court, event center, banquet facilities, lobby, pool, and other ancillary functions. In addition the project is planned to include 100 hotel rooms, primarily for casino guests.

A breakdown of square footage as it relates to traffic impacts is shown below:

- Casino and Entertainment areas – 293,250 s.f.
- Lobby/Bar/Back of House/Sundries – 14,750 s.f.
- Pool – 7,100 s.f.
315,100 s.f.

- Hotel Rooms – 77,000 s.f.

The site plan also shows supporting uses such as parking lots, parking structure, and wastewater treatment facilities. This layout is virtually the same as Alternative A except that the project has been reduced in size and intensity.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Site Access

There are three access points to the project. The main access points to the project are located on Langner Avenue and Labath Avenue via Wilfred Avenue. These approaches are assumed to operate as full movement driveways with no turn limitations. With the addition of the project, Labath Avenue will be extended to the south to intersect Business Park Drive. A third project access will be on Labath Avenue just north of Business Park Drive in the new extension and is assumed to be a full movement driveway with no turn limitations as well.

Currently, none of the accesses are signalized.

Trip Generation – Alternative H

Trip generation for Alternative H is identical to Alternative D. See Trip Generation – Alternatives D and H section under Alternative D for specific information.

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to destinations north of the site, with the remaining 70% distributed south of the site. To be conservative, only a small percentage of project traffic was assumed to be generated or attracted in the immediate vicinity of the project site. The project traffic distribution is shown in **Figure H3** and **Figure H4**. **Figure H5** illustrates project traffic assigned to the study intersections based on the assumed trip distribution. As seen in **Figure H5**, most of the project traffic is expected to come from the freeway therefore it was assumed that most of the traffic would use Labath Avenue because of its closer proximity to the freeway. As noted in the distribution, some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the Alternative H casino and hotel project. **Figure H6** illustrates the combined near-term turning movement volumes at the study intersections.

Cumulative Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the Alternative H casino and hotel project. **Figure H7** illustrates the combined long-term turning movement volumes at the study intersections.

Alternative H LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions:

- Near-term conditions with Alternative H (year 2008)
- Long-term Cumulative conditions with Alternative H (year 2020)

In the near-term analysis for Alternative H, it was assumed that the Wilfred Avenue widening project will not have taken place before the casino/hotel opens. The Memorandum of Understanding (MOU) between the City of Rohnert Park and the Federated Indians of the Graton Rancheria stated that the tribe would help financially to speed up the timeline of the widening project to occur before the casino/hotel opens in 2008.

Results of the analysis are presented in **Table H1**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections may operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

2008 Results

- Stony Point Road/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Commerce Boulevard
- Millbrae Avenue/Stony Point Road

2020 Results

- Stony Point Road/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Gravenstein Highway/Stony Point Road
- Millbrae Avenue/Stony Point Road

Table H 1 – Alternative H Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	F	841.3	F	OVRFL
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	12.7	B	12.5	B	14.7
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	12.6	B	12.5	B	14.4
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	C	20.1	B	12.5	D	28.5
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	557.9	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	323.7	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	83.4	F	169.9	F	116.2
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	24.6	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	24.0	C	26.8	D	36.0
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	82.7	E	74.2	F	87.0
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	17.9	B	19.0	B	19.6
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	63.3	D	50.8	E	55.9
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	A	9.8	-	-	A	9.6
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	C	16.7	C	22.2
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	B	19.6	B	18.5	C	21.5
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	29.6	C	28.2	C	29.1
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	25.7	C	29.1	C	26.9
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.3	B	16.0	B	16.1
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	15.6	B	12.3	B	14.9
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	40.6	E	63.4	C	34.0
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	36.9	D	45.5	F	114.9
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	26.8	D	42.4	D	52.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.0	B	18.1	B	19.6
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.2	B	11.5	B	11.2
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	61.3	F	90.2	F	120.3
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.6	B	12.4	B	12.1
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.7	B	12.5	B	12.3
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	B	10.7	B	11.3	B	11.1
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	14.7	B	13.5
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.7	B	11.4

Alternative H Traffic Signal Warrant Analysis

Alternative H, near-term and long-term, traffic volumes at unsignalized study intersections were compared against peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*.

Results of the analysis showed that the following intersections will satisfy traffic signal Warrant #3 by the year 2008 and 2020.

- Stony Point Road/Wilfred Avenue (2008 and 2020)
- Labath Avenue/Wilfred Avenue (2008 and 2020)
- Dowdell Avenue/Wilfred Avenue (2008 and 2020)
- Millbrae Avenue/Stony Point Road (2008 and 2020)

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Alternative H LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed Alternative H, reduced-intensity casino and hotel were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the casino and hotel project. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table H2**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project; however the congestion is reduced as a result of the smaller casino and hotel.

Table H 2 – Alternative H Freeway Levels of Service

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt H		2020		2020 + Alt H	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	24.1	C	25.6	D	33.3
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	32.8	D	34.1	E	39.4
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	34.0	E	36.1	F	40.6
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	28.4	D	32.3	E	41.4
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	33.8	E	37.1	F	42.0
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	23.4	C	23.2	C	24.8
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	C	27.7	D	29.0	E	35.2
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	C	27.7	D	29.0	E	35.2
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	C	27.7	D	29.0	E	35.2
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	31.2	E	40.4	E	39.8
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	31.2	E	40.4	E	39.8
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	31.2	E	40.4	E	39.8
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.2	D	29.7	D	31.7
Southbound											
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	C	25.5	D	28.5	D	30.3
Santa Rosa Avenue SB On-Ramp	E	D	31.2								
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	35.1	F	-	F	-
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.2	F	44.8	F	46.2
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	40.9	E	39.9	F	45.4
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	40.9	E	39.9	F	45.4
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	40.9	E	39.9	F	45.4
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.1	E	38.5	F	40.7
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	33.9	F	37.5	F	41.3
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	26.8	E	36.6	F	-
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	33.6	F	40.3	F	44.7
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	36.4	F	42.3	F	46.6
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	26.5	D	32.0	E	41.3

Potential Effects on Intersection Safety

Traffic volumes generated by the project were reviewed in consideration of existing intersection collision history and the potential for increased accidents. According to collision data, accidents involving bicyclist and pedestrians are very low. Many intersections did not report any collisions of this type during the survey period. This suggests that bicycle and pedestrian volumes are relatively low and study intersections have minimal safety hazards for individuals biking or walking. Although the project will introduce increased traffic volumes at some intersections, bicyclists and pedestrians are expected to be able to travel through study intersections with similar levels of safety. Historically casinos do not attract a significant amount of bicycle and pedestrian traffic. . Therefore, the expected amount of pedestrian and bicycle traffic is nominal and a significant increase in bicycle and pedestrian accidents is unlikely.

The potential for increased collisions between motorized vehicles was also considered. Collision frequency and severity are a function of many complex factors that vary depending on the location and type of intersection or roadway segment. Factors include traffic control such as signals or stop signs, lane and shoulder widths, grades, driveway densities, roadside hazards or obstacles, presence of left and right turn lanes, sight distance, congestion, and others.

Because of the number and interrelationships of the variables, accurate crash prediction is difficult. However, the proposed casino and hotel project will increase roadway congestion, a factor which could result in an increase in traffic collisions if left unmitigated. Other factors are expected to remain unaffected.

As noted previously, the purpose of this study is to address the traffic and transportation effects of the proposed casino and hotel development. This includes mitigation improvements to restore traffic operations to levels within acceptable standards or to levels as good as or better than without the casino/hotel project. Any potential increases in accidents due to project-related traffic would be offset by the implementation of roadway improvements included as mitigation. Therefore, if mitigations are implemented as proposed in this report, no significant increase in daytime or nighttime collisions is expected.

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table H3**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.



Table H 3 – Alternative H Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length		Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020				2008	2020
1 Stony Point Road and Wilfred Avenue	EBL				16 Stony Point Road and Rohnert Park Expy	EBL			
	EBR					EBR			
	WBL					WBL			
	WBR	35	OVRFL	OVRFL		WBR	175	54	60
	NBL	150	25	25		NBL			
	NBR					NBR	450	38	40
4 Langner Avenue and Wilfred Avenue	SBL	150	25	26		SBL	700	194	213
	SBR					SBR			
	EBL					EBL	160	61	67
	EBR					EBR	200	25	26
	WBL	150		25		WBL	250	80	43
	WBR					WBR	170	25	25
5 Labath Avenue and Wilfred Avenue	NBL					NBL	130	36	38
	NBR					NBR	130	36	33
	SBL					SBL	100	451	424
	SBR					SBR			
	EBL	150		25	18 Redwood Drive and Rohnert Park Expy	EBL	200	116	106
	EBR					EBR	200	25	25
6 Dowdell Avenue and Wilfred Avenue	WBL	150		52		WBL	350	156	211
	WBR					WBR	155	37	48
	NBL					NBL	250	157	136
	NBR					NBR	250	65	64
	SBL					SBL	175	188	237
	SBR					SBR	175	58	56
7 Redwood Drive and Wilfred Avenue	EBL	150		25	19 SB US 101 Ramps and Rohnert Park Expy	EBL			
	EBR					EBR			
	WBL	150		59		WBL	225	65	78
	WBR					WBR			
	NBL					NBL			
	NBR					NBR			
8 Redwood Drive and Commerce Boulevard	SBL					SBL	400	318	311
	SBR					SBR	400	222	197
	EBL	150		106		EBL	190	25	25
	EBR	150		154	20 NB US 101 Ramps and Rohnert Park Expy	EBR			
	WBL					WBL			
	WBR					WBR			
9 Wilfred Avenue and SB US 101 Ramps	NBL	150	317	352		NBL	225	321	342
	NBR	100	97	110		NBR			
	SBL	275	316	474		SBL			
	SBR					SBR			
	EBL	75	25		21 Commerce Blvd and Rohnert Park Expy	EBL	250	69	70
	EBR	75	49			EBR			
10 Golf Course Drive and Commerce Blvd	WBL	100	25			WBL	200	187	264
	WBR					WBR			
	NBL	150	132			NBL	250	210	245
	NBR	150	25			NBR	175	56	75
	SBL	200	40			SBL	150	98	147
	SBR					SBR	150	51	50
11 Roberts Lake Drive and Golf Course Drive	EBL				22 Stony Point Road and Gravenstein Hwy	EBL	350	162	183
	EBR					EBR			
	WBL	300	34	27		WBL	500	155	138
	WBR					WBR	150	41	39
	NBL					NBL	550	296	290
	NBR					NBR	675	30	29
12 Commerce Blvd and NB US 101 Ramps	SBL	250	229	342		SBL	500	148	325
	SBR					SBR	625	49	51
	EBL					EBL	225	161	171
	EBR				23 Redwood Road and Gravenstein Hwy	EBR			
	WBL	150	778	190		WBL	150	65	81
	WBR					WBR	80	25	33
13 Business Park Drive and Redwood Drive	NBL	150	718	1011		NBL	50	65	65
	NBR					NBR			
	SBL	200	94	30		SBL	225	388	513
	SBR					SBR			
	EBL	80	107	67	24 Gravenstein Hwy and SB US 101 Ramps	EBL			
	EBR					EBR	50	99	99
14 Commerce Blvd and NB US 101 Ramps	WBL					WBL	100	106	125
	WBR					WBR			
	NBL					NBL			
	NBR					NBR			
	SBL	200	77	107		SBL	425	222	216
	SBR					SBR			
15 Business Park Drive and Redwood Drive	EBL	250	341	360	25 Gravenstein Hwy and NB US 101 Ramps	EBL			
	EBR	250	25	37		EBR			
	WBL					WBL			
	WBR					WBR			
	NBL	200	478	531		NBL	395	137	144
	NBR					NBR	275	178	192
16 Business Park Drive and Redwood Drive	SBL	100	25	25	26 Stony Point Road and Millbrae Avenue	SBL			
	SBR	175	152	195		EBL			
	EBL	225	97	75		EBR			
	EBR					WBL			
	WBL					WBR	120	43	110
	WBR					NBL	505	25	25
17 Labath Avenue and Rohnert Park Expy	NBL					NBR	120	25	25
	NBR					SBL	490	25	25
	SBL					SBR			
	SBR								
	EBL								
	EBR								

Alternative H Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Alternative H traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown in **Table H4** are needed in the near-term (2008) and long-term (2020).

Table H5 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections.

Figures H8 and H9 illustrate the mitigated lane geometry and traffic control. Some mitigations are associated with queuing impacts.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue.

The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to Langner Avenue at the edge of the project site. From Langner Avenue west to Stony Point Road, Wilfred Avenue should be two lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and should include Class II bike lanes out to Stony Point Road to connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Langner Avenue, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Langner Avenue and Labath Avenue should be improved and either removed from County jurisdiction or designed to the County standard.

An overcrossing should be built from State Farm Drive to Business Park Drive over US-101 with a southbound slip ramp lane that would open up just south of the US-101 NB off-ramp directly to the overcrossing. The overcrossing helps redirect project traffic away from the Wilfred interchange to a new facility capable of accommodating casino traffic. Additional right-of-way is necessary on State Farm Drive as well as Business Park Drive. Access to State Farm Drive will need to be modified and adjusted, but it is not anticipated that there will need to be any closures associated with the overcrossing. The overcrossing should begin east of the State Farm Drive/Commerce Boulevard intersection and touch down west of the Business Park Drive/Redwood Drive



intersection. With this mitigation, all of the existing turning movements at the Commerce/State Farm and the Redwood/Business Park intersections will be permitted as they currently exist.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

Table H 4 – Alternative H Summary of Mitigations

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	1	Stony Point Rd/ Wilfred Ave	• Signalize	No	Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	• Signalize • Add WB left and change WB all shared to through-right ¹ • Add NB right and change NB all shared to left-through	No Yes Yes	Capacity Capacity Tribelands
	6	Dowdell Ave/ Wilfred Ave	• Signalize • Add WB left and change WB all shared to through-right ¹ • Add EB left and change EB all shared to through-right ¹	No Yes Yes	Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	• Change WB left-through to WB through • Change phasing east-west to protected from split • Optimize signal timing • Add EB left and change EB all shared to through-right ¹	No No No Yes	Capacity Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	No mitigation necessary	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	No mitigation necessary	-	-
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	• Construct the State Farm-Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing	Yes	Capacity
	13	Project Driveway/ Stony Point Rd	No mitigation necessary	-	-
	14	Business Park Dr/ Labath Ave	No mitigation necessary	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	• Extend SB left turn bay to 300 feet (from 100 feet)	Yes	Queue
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Extend NB left turn bay to 350 feet (from 225 feet) • Add second NB left turn lane	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	• Add an EB right turn overlap phase • Optimize signal timing	Yes No	Capacity Capacity
	22	Gravenstein Hwy/ Stony Point Rd	No mitigation necessary	-	-
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

¹ In summary, widen Wilfred Ave to three lanes from Labath Ave to Redwood Dr



Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	1	Stony Point Rd/ Wilfred Ave	• Signalize *	No	Capacity
	2	Primrose Ave/ Wilfred Ave	No mitigation necessary	-	-
	3	Whistler Ave/ Wilfred Ave	No mitigation necessary	-	-
	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	• Signalize * • Add NB right and change NB all shared to left-through *	No Yes	Capacity Tribeland
	6	Dowdell Ave/ Wilfred Ave	• Signalize *	No	Capacity
	7	Redwood Dr/ Wilfred Ave	• Optimize signal timing * • Change WB left-through to WB through * • Change phasing east-west to protected from split *	No No No	Capacity Capacity Capacity
	8	Redwood Dr/ Commerce Blvd	Modified Intersection (not analyzed)	-	-
	9	Wilfred Ave/ US-101 SB Ramps	No mitigation necessary	-	-
	10	Golf Course Dr/ Commerce Blvd	• Add EB right turn overlap phase	No	Capacity
	11	Golf Course Dr/ Roberts Lake Rd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	• Construct the State Farm-Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing *	Yes	Capacity
	13	Project Driveway/ Stony Point Rd	No mitigation necessary	-	-
	14	Business Park Dr/ Labath Ave	No mitigation necessary	-	-
	15	Business Park Dr/ Redwood Dr	No mitigation necessary	-	-
	16	Rohnert Park Expwy/ Stony Point Rd	No mitigation necessary	-	-
	17	Rohnert Park Expwy/ Labath Ave	• Extend SB left turn bay to 300 feet (from 100 feet) *	Yes	Queue
	18	Rohnert Park Expwy/ Redwood Dr	No mitigation necessary	-	-
	19	Rohnert Park Expwy/ US-101 SB Ramps	No mitigation necessary	-	-
	20	Rohnert Park Expwy/ US-101 NB Ramps	• Extend NB left turn bay to 350 feet (from 225 feet) * • Add second NB left turn lane *	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	No mitigation necessary	-	-
	22	Gravenstein Hwy/ Stony Point Rd	• Add a EB right turn bay for 100 feet • Optimize signal timing	Yes No	Capacity Capacity
	23	Gravenstein Hwy/ Redwood Dr	No mitigation necessary	-	-
	24	Gravenstein Hwy/ US-101 SB Ramps	No mitigation necessary	-	-
	25	Gravenstein Hwy/ US-101 NB Off-Ramp	No mitigation necessary	-	-
	26	Millbrae Ave/ Stony Point Rd	• Signalize *	No	Capacity
	27	Millbrae Ave/ Primrose Ave	No mitigation necessary	-	-
	28	Millbrae Ave/ Whistler Ave	No mitigation necessary	-	-
	29	Millbrae Ave/ Langner Ave	No mitigation necessary	-	-
	30	Millbrae Ave/ Labath Ave	No mitigation necessary	-	-
	31	Millbrae Ave/ Dowdell Ave	No mitigation necessary	-	-

* Improvement assumed to occur with 2008 mitigation

Table H 5 – Alternative H Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008						2020					
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Stony Point Rd/ Wilfred Ave	D	TWSC	F	180.8	F	495.5	F	OVRFL	C	21.2	F	841.3	F	OVRFL	C	28.1
2	Primrose Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	12.7	B	12.7	B	12.5	B	14.7	B	14.7
3	Whistler Ave/ Wilfred Ave	D	TWSC	A	9.4	B	11.4	B	12.6	B	12.6	B	12.5	B	14.4	B	14.4
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	C	20.1	C	16.5	B	12.5	D	28.5	C	21.4
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	557.9	C	26.3	F	OVRFL	F	OVRFL	C	25.8
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	323.7	C	24.7	F	OVRFL	F	OVRFL	C	35.1
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	83.4	D	38.6	F	169.9	F	116.2	D	53.1
8	Redwood Dr/ Commerce Blvd	C	TS	F	86.1	C	26.0	C	24.6	C	25.6	-	-	-	-	-	-
9	Wilfred Ave/ US-101 SB Ramps	D	TS	-	-	C	23.2	C	24.0	C	20.7	C	26.8	D	36.0	C	26.5
10	Golf Course Dr/ Commerce Blvd	D	TS	F	103.4	E	71.7	F	82.7	D	52.1	E	74.2	F	87.0	D	54.8
11	Golf Course Dr/ Roberts Lake Rd	C	TS	B	14.8	B	18.3	B	17.9	B	17.8	B	19.0	B	19.6	B	19.4
12	Commerce Blvd/ US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	63.3	D	47.9	D	50.8	E	55.9	D	43.8
13	Project Driveway/ Stony Point Rd	D	TWSC	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14	Business Park Dr/ Labath Ave	D	TWSC	-	-	-	-	A	9.8	B	10.9	-	-	A	9.6	B	10.6
15	Business Park Dr/ Redwood Dr	D	TWSC	C	23.9	D	27.5	D	27.5	D	27.5	C	16.7	C	22.2	C	22.2
16	Rohnert Park Expwy/ Stony Point Rd	D	TS	B	20.0	B	19.1	B	19.6	B	19.6	B	18.5	C	21.5	C	21.5
17	Rohnert Park Expwy/ Labath Ave	C	TS	C	24.6	C	25.8	C	29.6	C	29.6	C	28.2	C	29.1	C	29.1
18	Rohnert Park Expwy/ Redwood Dr	C	TS	C	24.2	C	26.3	C	25.7	C	25.8	C	29.1	C	26.9	C	26.9
19	Rohnert Park Expwy/ US-101 SB Ramps	D	TS	B	16.5	B	16.9	B	16.3	B	18.5	B	16.0	B	16.1	B	17.8
20	Rohnert Park Expwy/ US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	15.6	B	11.5	B	12.3	B	14.9	B	12.5
21	Rohnert Park Expwy/ Commerce Blvd	C	TS	D	39.2	D	44.6	D	40.6	C	30.9	E	63.4	C	34.0	C	33.7
22	Gravenstein Hwy/ Stony Point Rd	D	TS	C	32.1	D	37.1	D	36.9	D	36.9	D	45.5	F	114.9	D	52.7
23	Gravenstein Hwy/ Redwood Dr	D	TS	C	22.1	C	26.2	C	26.8	C	26.8	D	42.4	D	52.8	D	52.8
24	Gravenstein Hwy/ US-101 SB Ramps	D	TS	B	20.0	B	19.9	B	19.0	B	19.0	B	18.1	B	19.6	B	19.6
25	Gravenstein Hwy/ US-101 NB Off-Ramp	D	TS	B	13.1	B	11.5	B	11.2	B	11.2	B	11.5	B	11.2	B	11.2
26	Millbrae Ave/ Stony Point Rd	D	TWSC	E	43.9	E	43.5	F	61.3	A	9.8	F	90.2	F	120.3	B	10.1
27	Millbrae Ave/ Primrose Ave	D	TWSC	B	11.1	B	11.5	B	11.6	B	11.6	B	12.4	B	12.1	B	12.1
28	Millbrae Ave/ Whistler Ave	D	TWSC	B	11.4	B	11.5	B	11.7	B	11.7	B	12.5	B	12.3	B	12.3
29	Millbrae Ave/ Langner Ave	D	TWSC	A	9.7	A	9.9	B	10.7	B	10.7	B	11.3	B	11.1	B	11.1
30	Millbrae Ave/ Labath Ave	D	TWSC	B	11.3	B	11.7	B	11.7	B	11.7	B	14.7	B	13.5	B	13.5
31	Millbrae Ave/ Dowdell Ave	D	TWSC	B	11.3	B	11.4	B	11.4	B	11.4	B	11.7	B	11.4	B	11.4

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table H6**:

- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Rohnert Park Expressway and from Gravenstein Highway (SR-116) to West Sierra Avenue in the long-term (2020).

Aside from roadway improvements to mitigate protect impacts, the casino and hotel should coordinate with the Green Music Center during outdoor events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park interchange may be necessary. Therefore, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur, the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control.

Because no fixed route service will be available at the project site, the casino/hotel should provide a shuttle that serves the two Rohnert Park transfer stations. The shuttle should run throughout the day or could be called out on demand.

The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

Table H 6 – Alternative H Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt H		2008 + Alt H Mitigated		2020		2020 + Alt H		2020 + Alt H Mitigated	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound															
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	24.1	C	24.1	C	25.6	D	33.3	D	33.3
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	32.8	D	32.8	D	34.1	E	39.4	E	39.4
Gravenstein Highway NB On-Ramp	E	D	34.5	D	29.5	D	34.0	D	34	E	36.1	F	40.6	E	42.5
US-101 Between Gravenstein Highway and Rohnert Park Expressway (NB)	E	D	28.1	C	23.5	D	28.4	D	28.4	D	32.3	E	41.4	E	42.5
Rohnert Park Expressway NB Off-Ramp	E	D	33.6	D	28.8	D	33.8	D	33.8	E	37.1	F	42.0	E	42.5
Rohnert Park Expressway NB On-Ramp (Loop Ramp)	E	D	32.1	C	21.8	C	23.4	C	23.4	C	23.2	C	24.8	C	24.8
Rohnert Park Expressway NB On-Ramp	E	D	32.5	C	22.1	C	27.7	C	27.7	D	29.0	E	35.2	E	35.2
US-101 Between Rohnert Park Expressway and Wilfred Avenue (NB)	E	D	28.9	C	22.1	C	27.7	C	27.7	D	29.0	E	35.2	E	35.2
Wilfred Avenue NB Off-Ramp	E	E	35.4	C	22.1	C	27.7	C	27.7	D	29.0	E	35.2	E	35.2
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	31.2	D	31.2	E	40.4	E	39.8	E	39.8
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	31.2	D	31.2	E	40.4	E	39.8	E	39.8
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	31.2	D	31.2	E	40.4	E	39.8	E	39.8
US-101 North of Santa Rosa Avenue (NB)	E	C	20.3	C	22.0	C	23.2	C	23.2	D	29.7	D	31.7	D	31.7
Southbound															
US-101 North of Santa Rosa Avenue (SB)	E	C	22.9	C	24.1	C	25.5	C	25.5	D	28.5	D	30.3	D	30.3
Santa Rosa Avenue SB On-Ramp	E	D	31.2												
US-101 Between Santa Rosa Avenue and Wilfred Avenue (SB)	E	D	31.5	D	32.7	E	35.1	E	35.1	F	-	F	-	C	24.4
Wilfred Avenue SB Off-Ramp	E	E	38.0	E	38.8	E	40.2	E	40.2	F	44.8	F	46.2	D	32.2
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	40.9	E	40.9	E	39.9	F	45.4	D	32.4
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	40.9	E	40.9	E	39.9	F	45.4	D	32.4
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	40.9	E	40.9	E	39.9	F	45.4	D	32.4
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.1	D	33.1	E	38.5	F	40.7	C	26.0
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	33.9	D	33.9	F	37.5	F	41.3	E	38.5
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	26.8	D	26.8	E	36.6	F	-	E	38.5
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	33.6	D	33.6	F	40.3	F	44.7	E	38.5
Gravenstein Highway SB On-Ramp	E	D	33.7	D	32.1	E	36.4	E	36.4	F	42.3	F	46.6	D	30.6
US-101 South of Gravenstein Highway (SB)	E	C	24.7	C	21.8	D	26.5	D	26.5	D	32.0	E	41.3	C	22.2

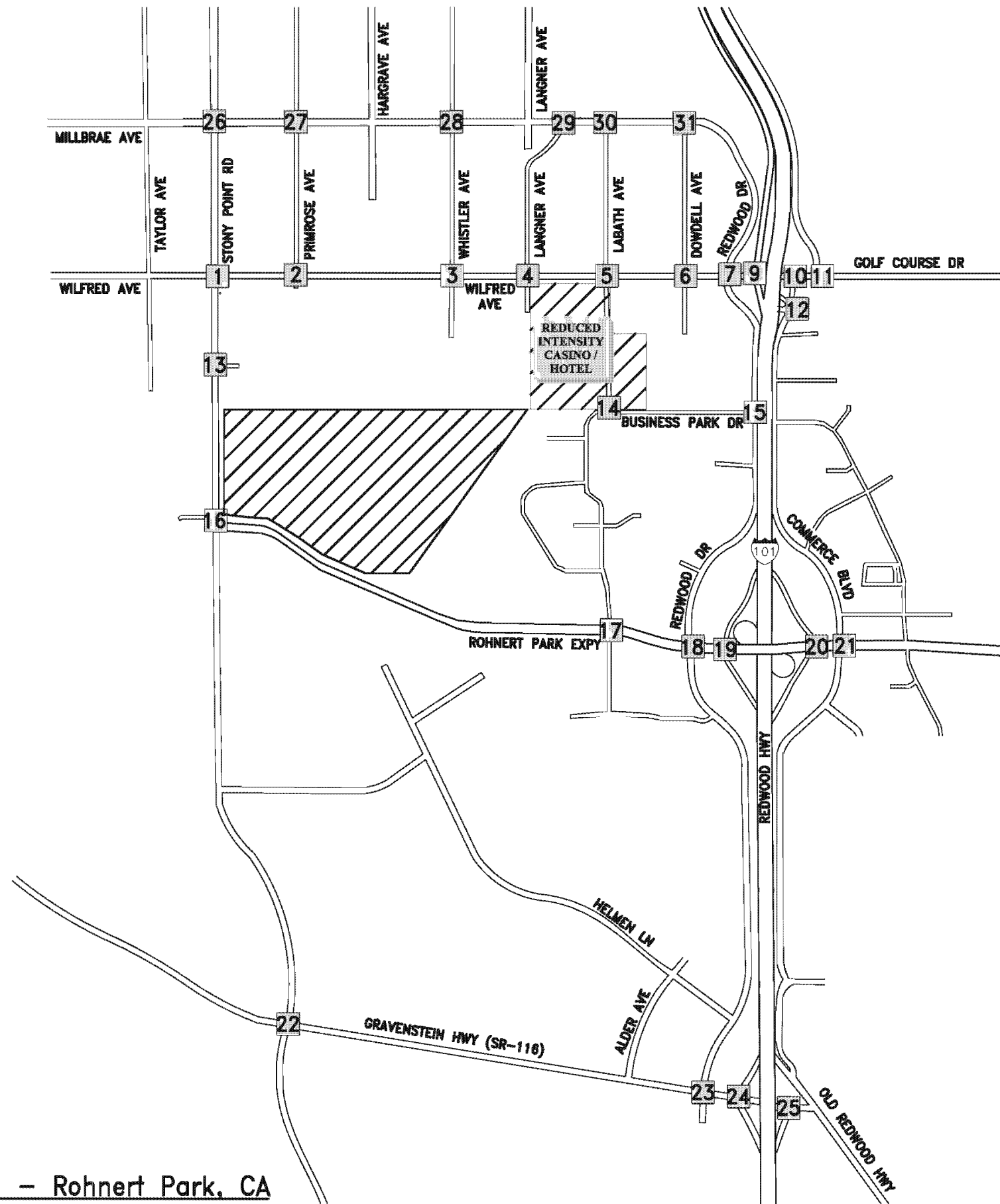
It is recommended that the casino contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating or shortening the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.

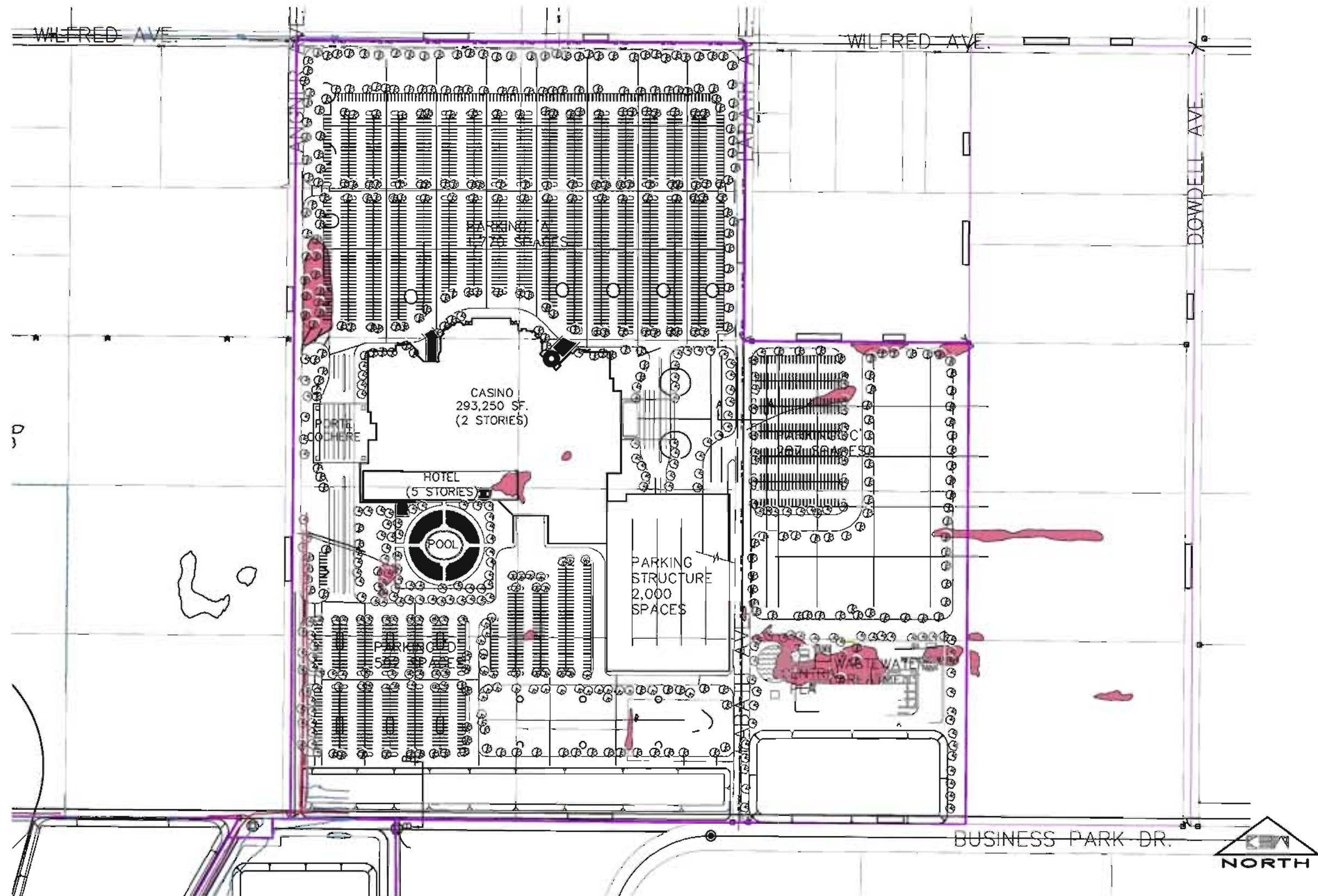


Graton Rancheria Alternative H - Rohnert Park, CA

PROJECT LOCATION

FIGURE H1



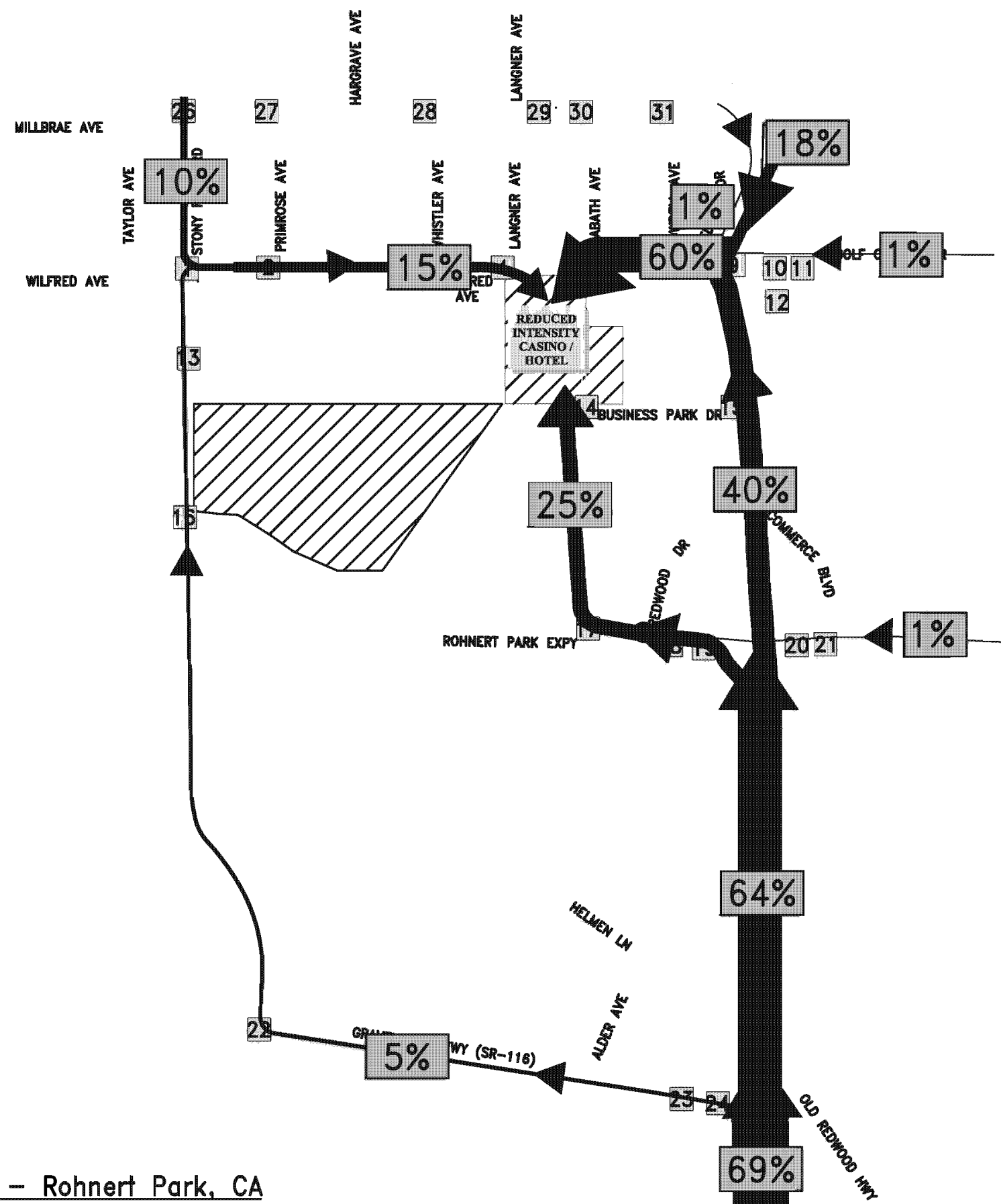


Graton Rancheria Alternative H - Rohnert Park, CA

SITE PLAN

FIGURE H2





Kimley-Horn and Associates, Inc.



Graton Rancheria Alternative H - Rohnert Park, CA

TRIP DISTRIBUTION - OUT

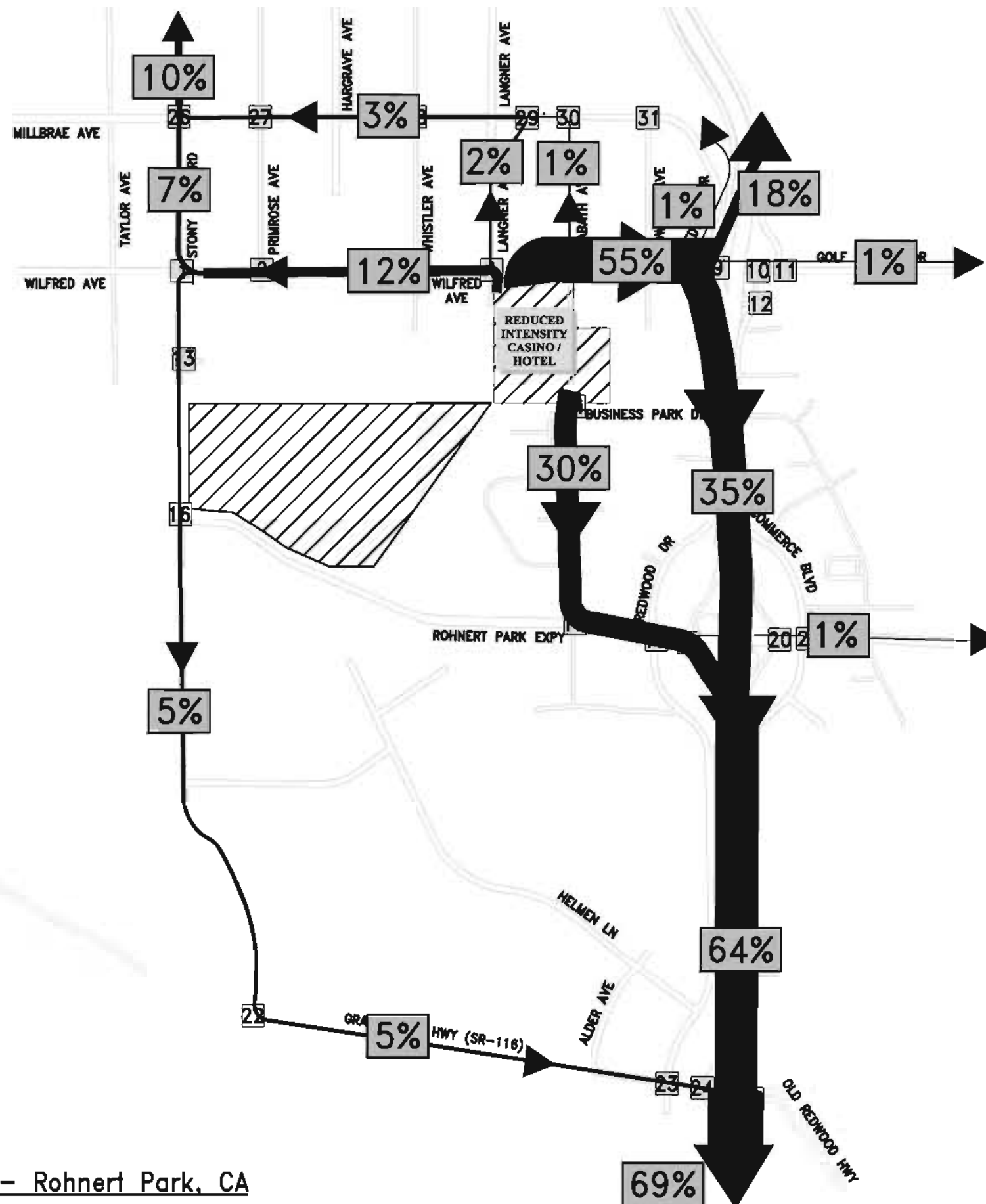
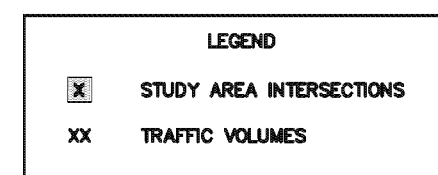
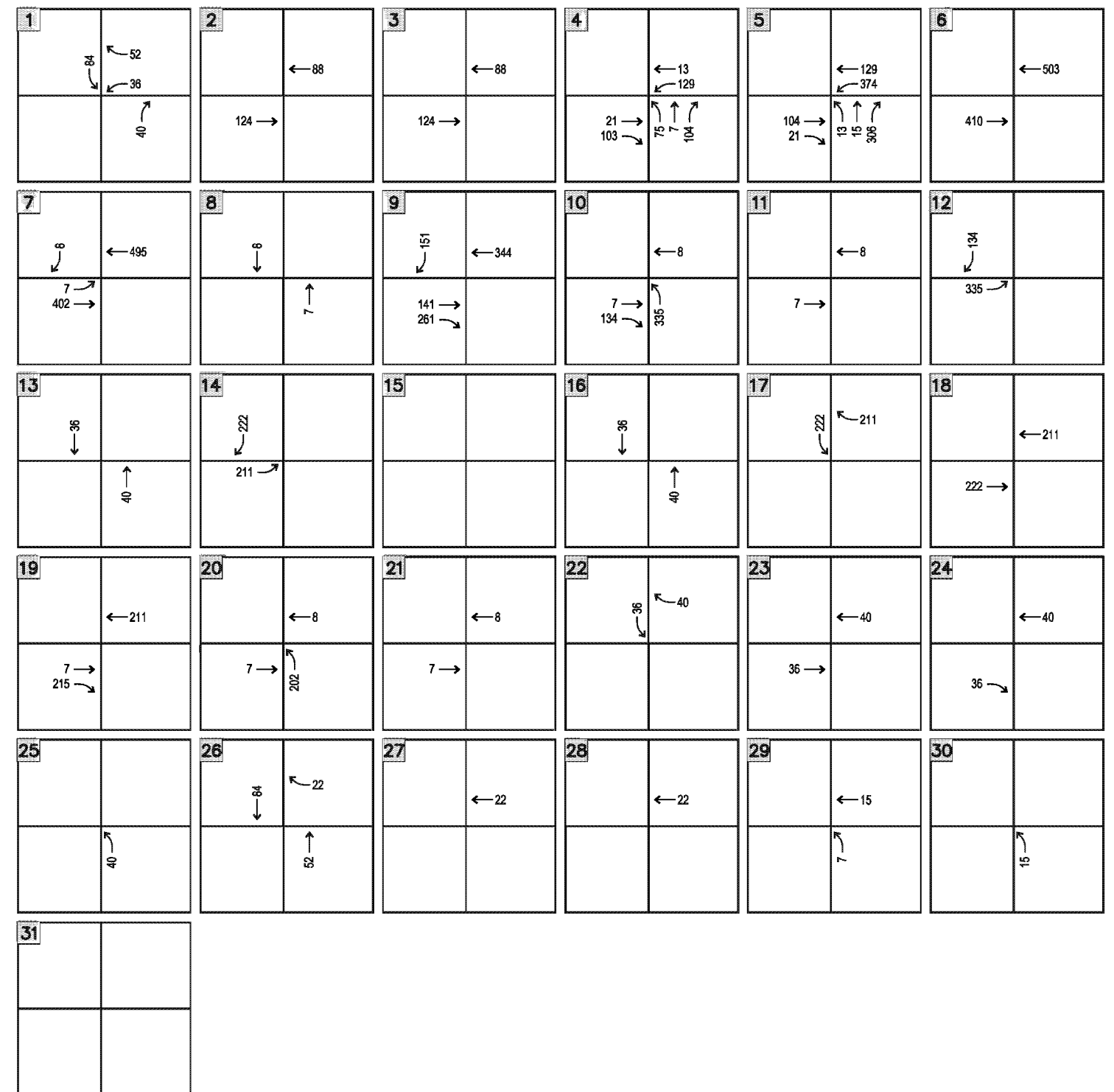
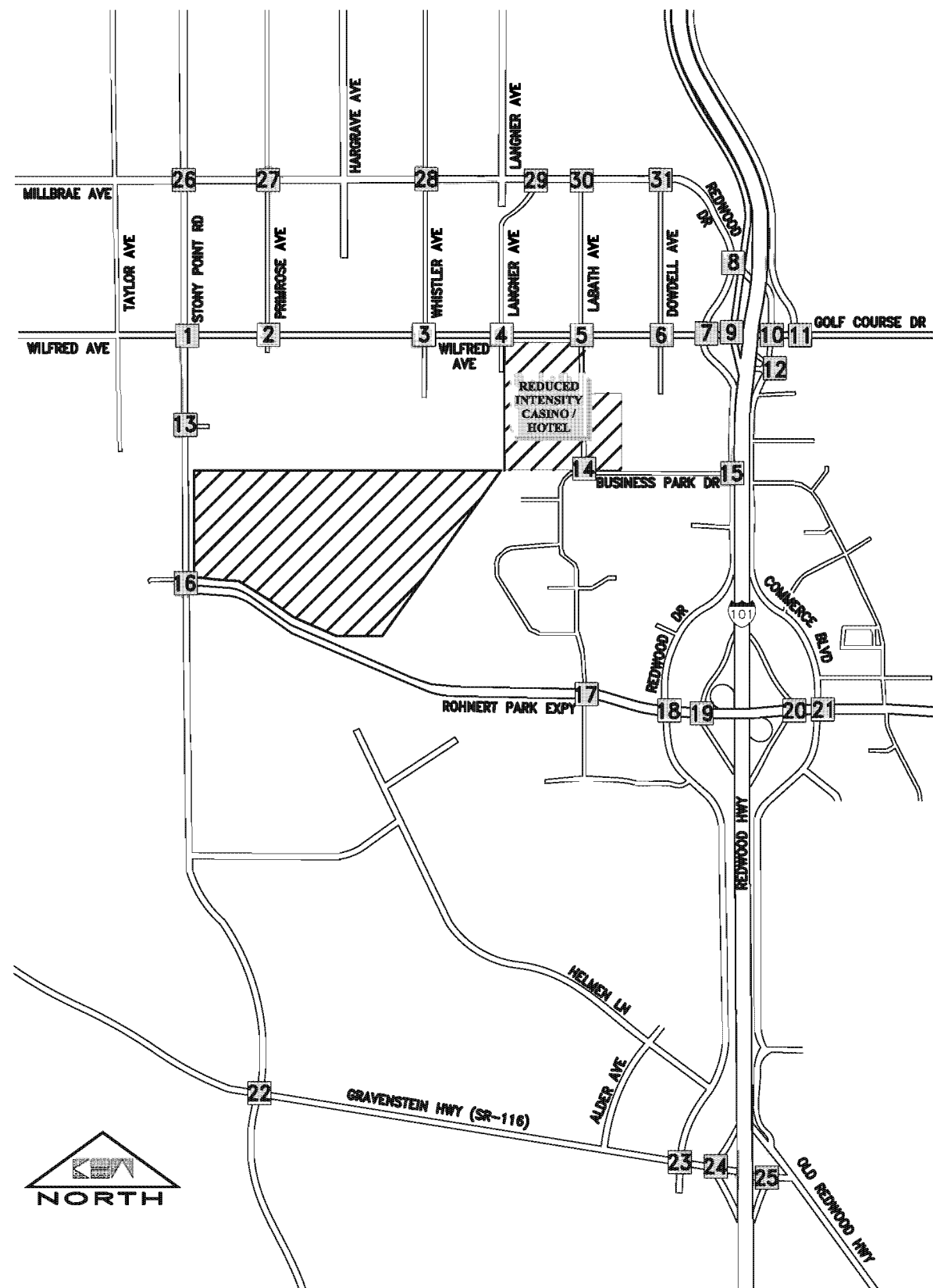


FIGURE H4



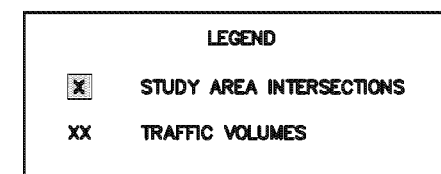
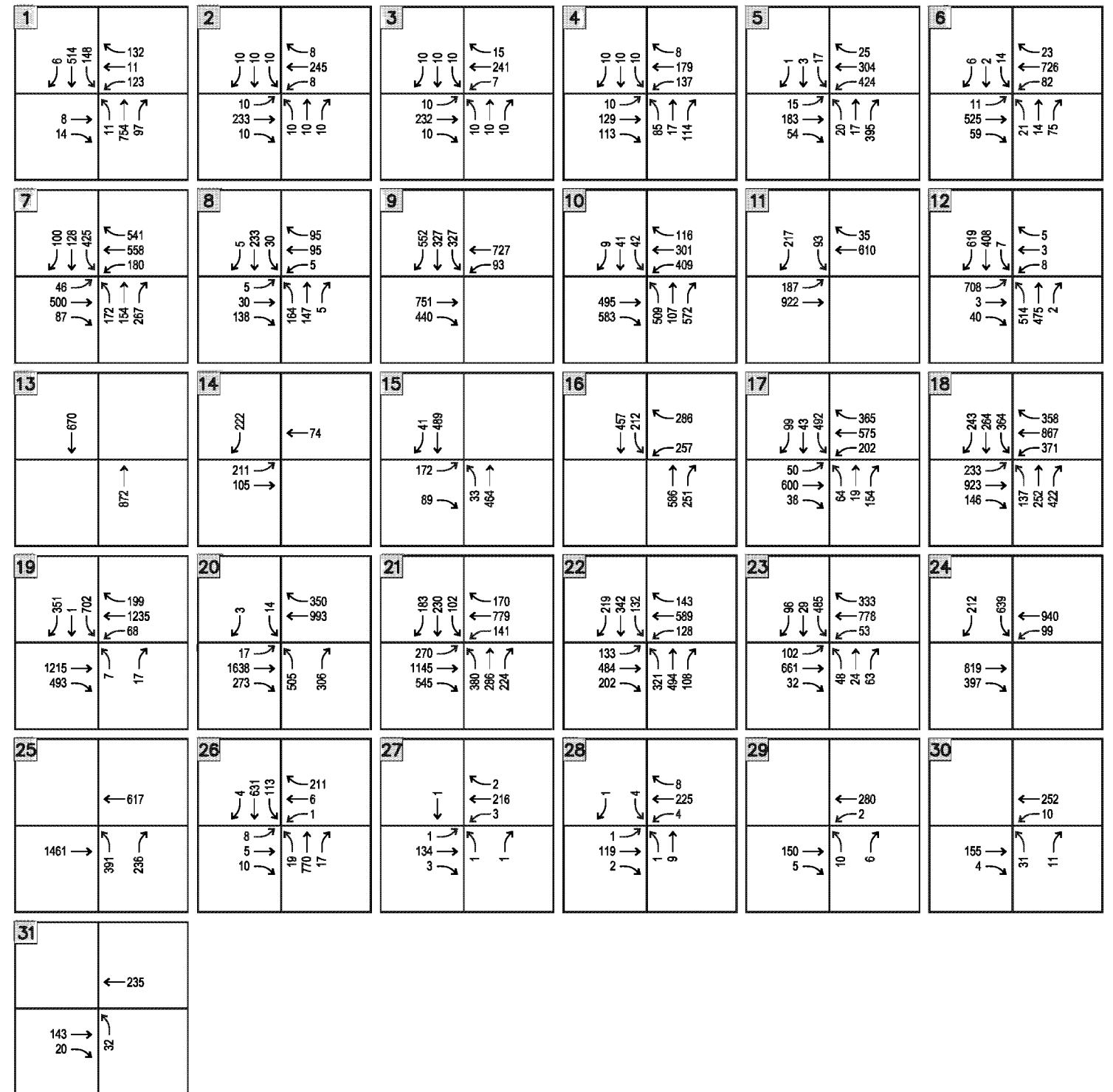
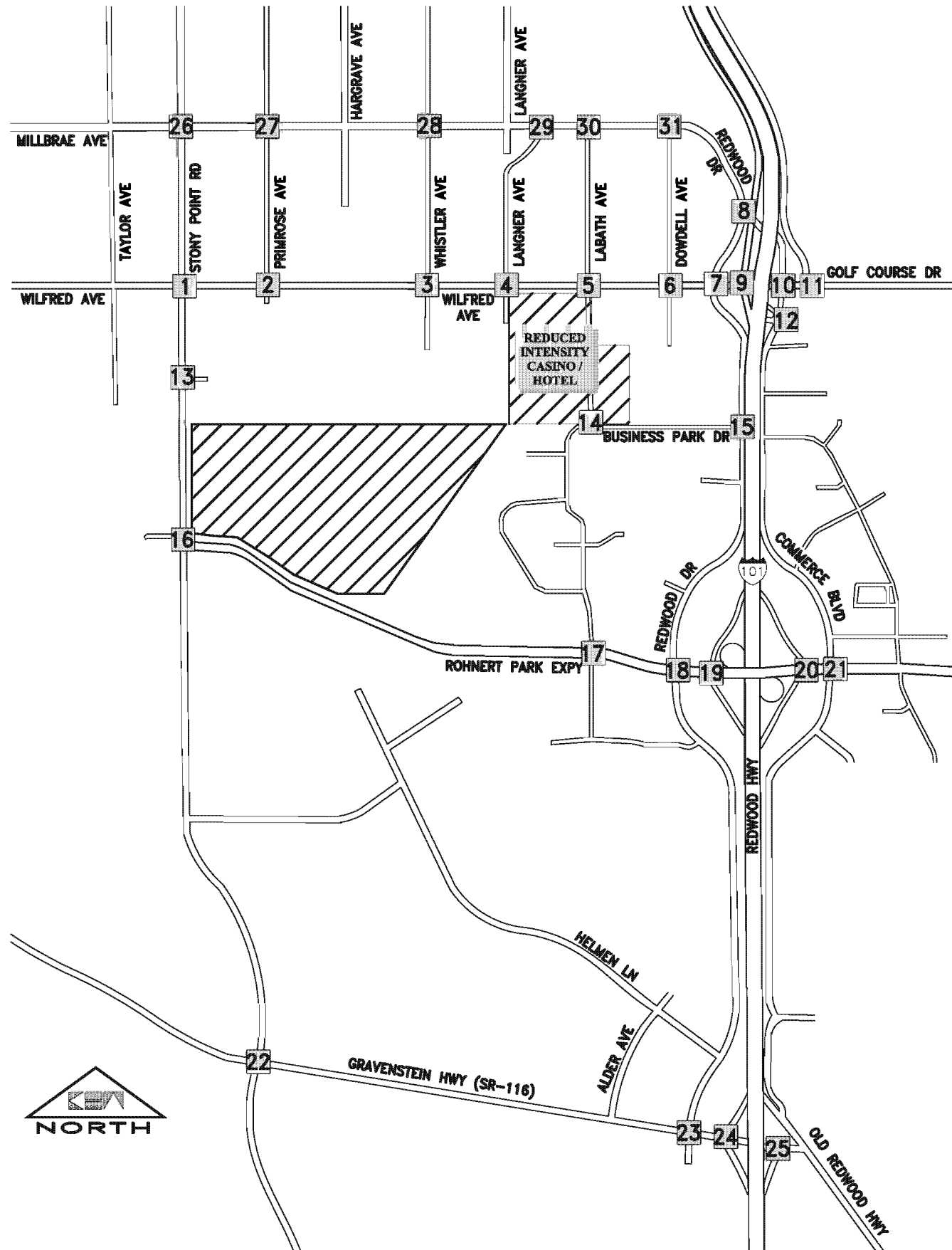


Graton Rancheria Alternative H - Rohnert Park, CA

PROJECT GENERATED PM TRAFFIC VOLUMES

FIGURE H5



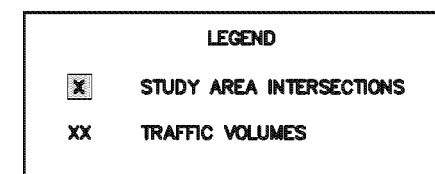
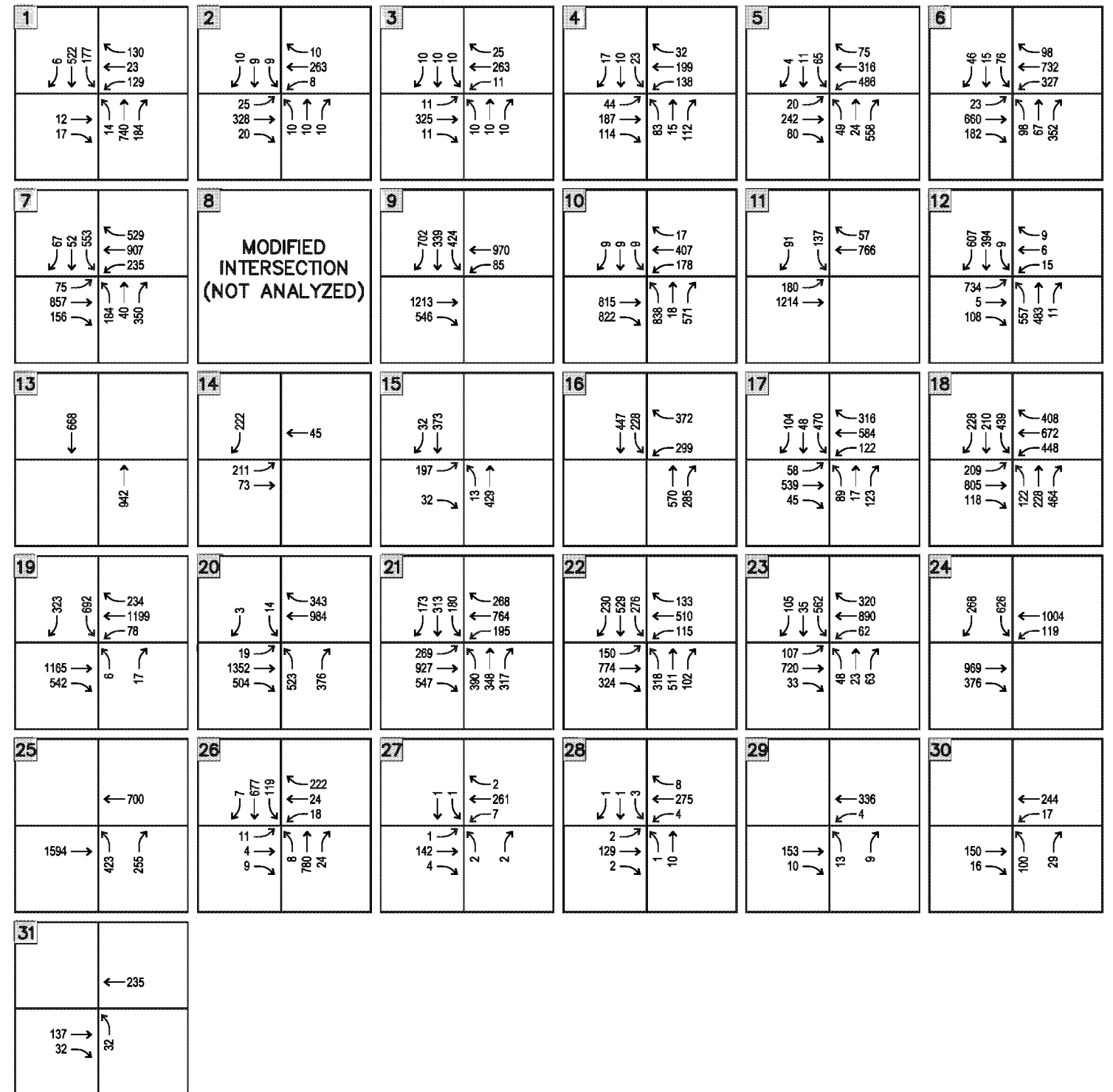
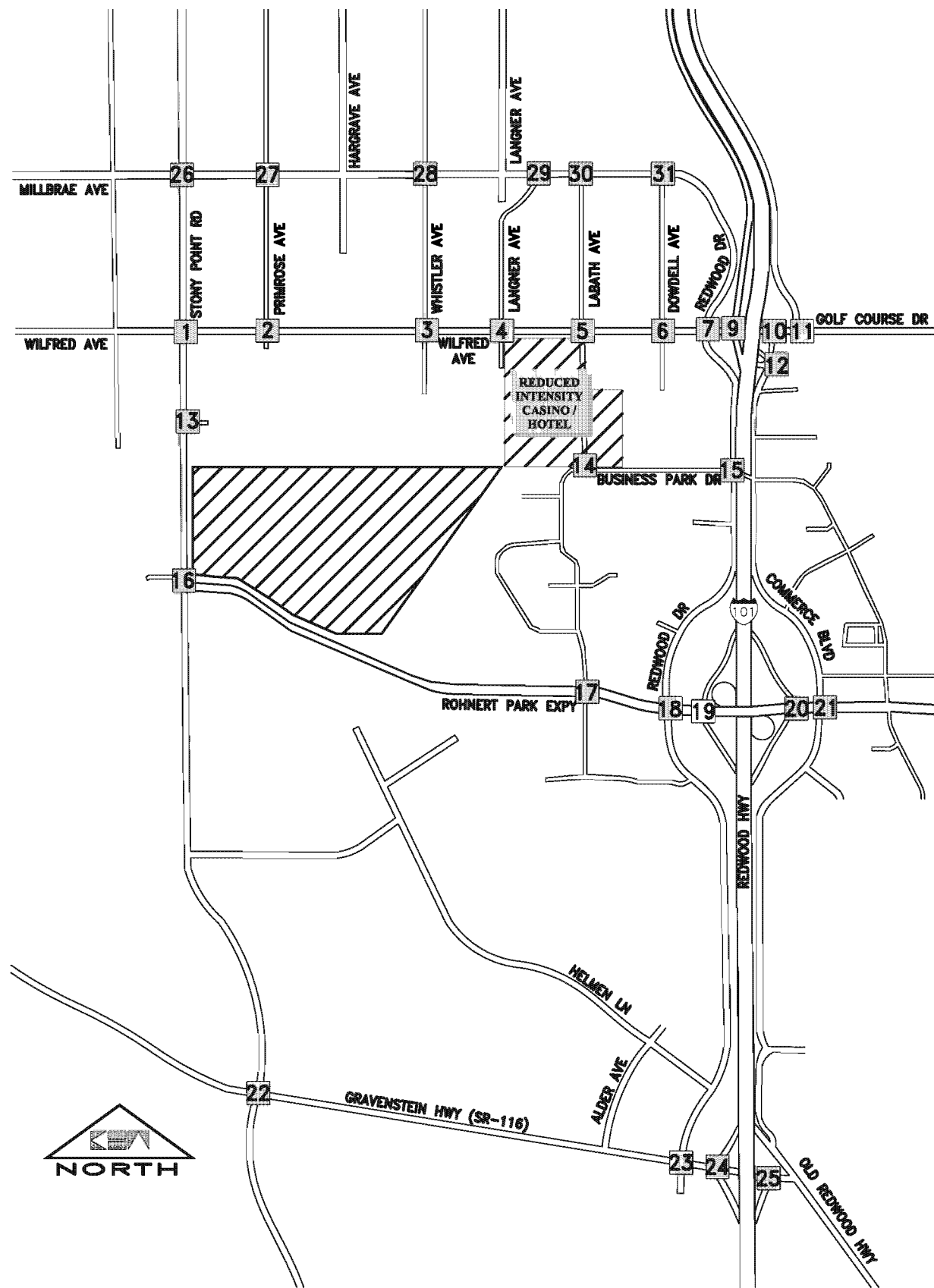


Graton Rancheria Alternative H - Rohnert Park, CA

NEAR-TERM + PROJECT PM TRAFFIC VOLUMES

FIGURE H6





Graton Rancheria Alternative H - Rohnert Park, CA

LONG-TERM CUMULATIVE + PROJECT PM TRAFFIC VOLUMES

FIGURE H7



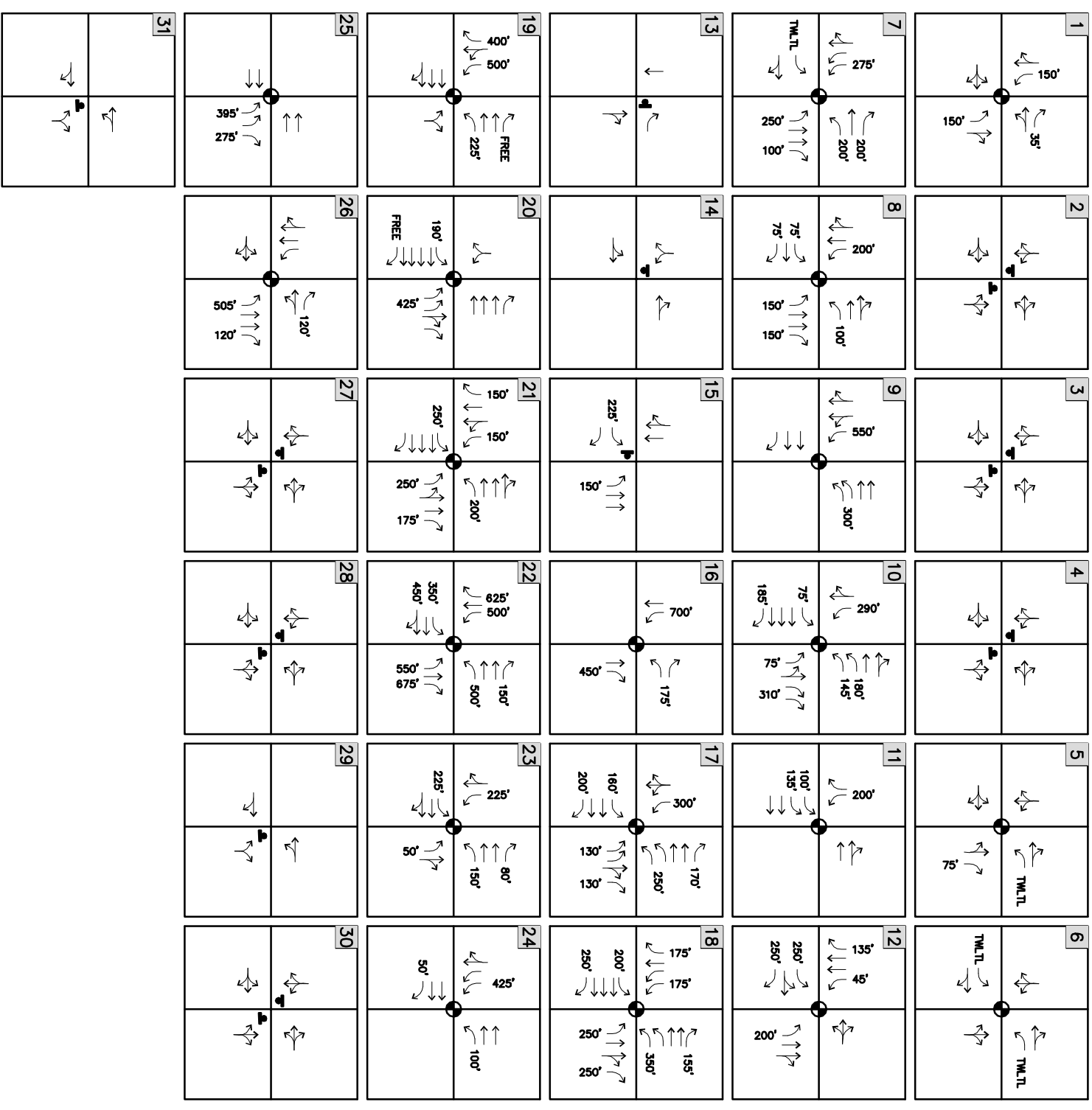
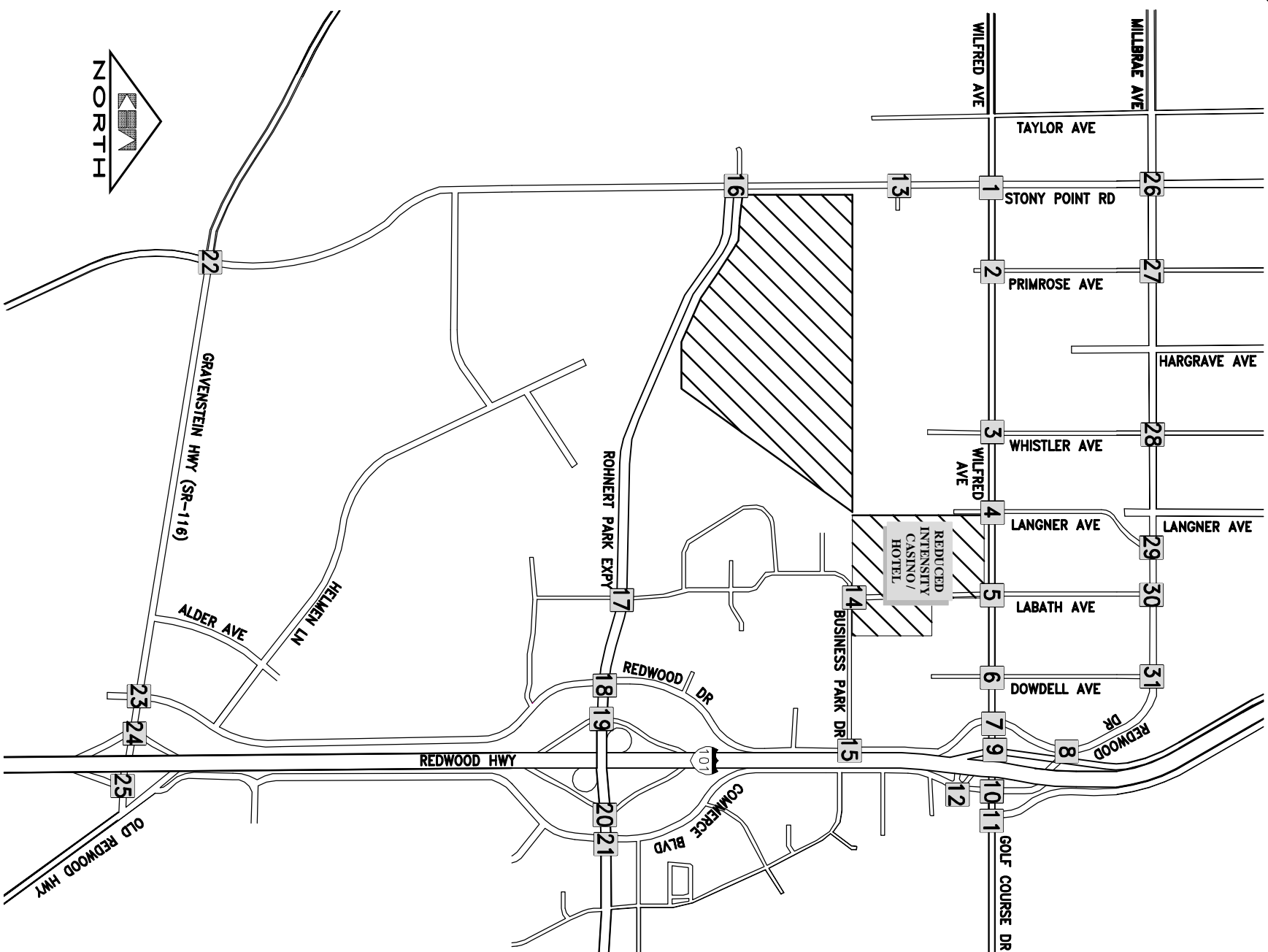


FIGURE H8

VARIANT H-SUB1 – WILFRED AVENUE SITE REDUCED INTENSITY OPTION

The Variant H-sub1 casino and hotel is proposed to be at the same site location as Alternative H, which is bordered by Wilfred Avenue in the north, Business Park Drive in the south, Langner Avenue in the west, and Dowdell Avenue in the east.

The proposed layout of the casino and hotel facility includes a main building of approximately 359,600 square feet for a casino, restaurants, food court, event center, banquet facilities, lobby, pool, spa, and other ancillary functions. In addition the project is planned to include 200 hotel rooms, primarily for casino guests.

A breakdown of square footage as it relates to traffic impacts is shown below:

- Casino and Entertainment areas – 317,750 s.f.
- Lobby/Bar/Back of House/Sundries – 14,750 s.f.
- Spa – 20,000 s.f.
- Pool – 7,100 s.f.
359,600 s.f.

- Hotel Rooms – 154,000 s.f.

The site plan also shows supporting uses such as parking lots, parking structure, and wastewater treatment facilities. This layout is virtually the same as Alternative H except that the project has been increased in size and intensity.

Within each alternative there is a reference made to the “project site” which changes for each alternative. There is not a specific project site that is being evaluated for all of the alternatives.

Because Variant H-sub1 represents a level of development between the preferred Alternative A and reduced intensity Alternative H, analysis of this alternative only addressed roadway facilities where the impacts and mitigations were different between the high and low intensity alternatives. Intersections, freeway segments, and freeway ramps where the impacts and mitigations were the same between Alternative A and Alternative H did not need to be analyzed further because they would be the same for Variant H-sub1.

Trip Generation – Variant H-sub1

Project trip generation for Variant H-sub1 is shown in **Table H-sub1 1**. Additional trip generation calculations are contained in the **Appendix**. As seen in the table Variant H-sub1 is expected to generate 1,098 new trips in the AM and 1,819 new trips in the PM



peak hour. Although project trip generation was prepared for daily, AM, and PM periods, only the weekday PM traffic conditions were evaluated in this report because it represents the time period where the project will contribute to the greatest amount of congestion and potential mitigation. Other time periods that were considered included weekday AM, weekday late PM, and Saturday. On weekday late evenings and Saturday evenings the casino facility will generate more trips than during the 4-6 PM weekdays, but the background traffic is lower, making the overall number of vehicles on the road lower as well. Therefore, the PM peak represents the worst case period to evaluate.

Table H-sub1 1 – Variant H-sub1 Project Trip Generation

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Casino 359,600 s.f.	14,179	743	318	1,061	943	837	1,780
Hotel 200 Rooms*	545	23	14	37	21	18	39
Net New Vehicle Trips	14,724	766	332	1,098	964	855	1,819

*Trip rate is ITE Land Use Code 310 – Hotel. Rate reduced by 2/3 to account for internal capture to/from casino.

Project Trip Distribution and Assignment

Based on the factors discussed in the General Project Information section above it was determined that approximately 30% of the project traffic would be distributed to destinations north of the site, with the remaining 70% distributed south of the site. To be conservative, only a small percentage of project traffic was assumed to be generated or attracted in the immediate vicinity of the project site. Most of the project traffic is expected to come from the freeway therefore it was assumed that most of the traffic would use Labath Avenue because of its closer proximity to the freeway. Some traffic leaving the project site is expected to avoid congestion at Wilfred Avenue and Stony Point Road by using Millbrae Avenue.

Near-Term Plus Project Traffic Volumes

Near-term 2008 traffic volumes were combined with vehicle trips expected to be generated by the Variant H-sub1 casino and hotel project.

Cumulative Plus Project Traffic Volumes

Long-term 2020 traffic volumes were combined with vehicle trips expected to be generated by the Variant H-sub1 casino and hotel project.

Variant H-sub1 LOS Conditions and Impacts at Intersections

Traffic operations were evaluated under the following development conditions at the following study intersections, freeway segments and ramps:

- Near-term conditions with Variant H-sub1 (year 2008)
- Long-term Cumulative conditions with Variant H-sub1 (year 2020)

Intersections

- #4 - Langner Ave and Wilfred Ave
- #5 - Labath Ave and Wilfred Ave
- #6 - Dowdell Ave and Wilfred Ave
- #7 - Redwood Dr and Wilfred Ave
- #10 - Golf Course Dr and Commerce Blvd
- #12 - Commerce Blvd and US 101 NB Ramps
- #17 - Rohnert Park Expressway and Labath Ave
- #20 - Rohnert Park Expressway and US 101 NB Ramps
- #21 - Rohnert Park Expressway and Commerce Blvd

Freeway Segments

- Northbound US-101 south of Gravenstein Highway (SR-116)
- Northbound US-101 between Wilfred Avenue and Santa Rosa Avenue
- Southbound US-101 between Wilfred Avenue and Rohnert Park Expressway
- Southbound US-101 between Rohnert Park Expressway and Gravenstein Highway (SR-116)

Freeway Ramps

- Northbound Wilfred Avenue on-ramp
- Southbound Wilfred Avenue on-ramp
- Southbound Rohnert Park Expressway loop on-ramp
- Southbound Rohnert Park Expressway on-ramp
- Northbound Gravenstein Highway (SR-116) off-ramp
- Northbound Santa Rosa Avenue off-ramp
- Southbound Rohnert Park Expressway off-ramp
- Southbound Gravenstein Highway (SR-116) off-ramp

In the near-term analysis for Variant H-sub1, it was assumed that the Wilfred Avenue widening project will not have taken place before the casino/hotel opens. The Memorandum of Understanding (MOU) between the City of Rohnert Park and the Federated Indians of the Graton Rancheria stated that the tribe would help financially to speed up the timeline of the widening project to occur before the casino/hotel opens in 2008.

Results of the analysis are presented in **Table H-sub1 2**. (Results shown as bold in the table do not meet operational standards.) The signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections may operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Additional detail is provided in the **Appendix**. As shown in the results, the following intersections and approaches will fail to meet acceptable level of service thresholds based on established significance criteria and with the addition of project-related traffic.

2008 Results

- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps
- Rohnert Park Expressway/Commerce Boulevard

2020 Results

- Langner Avenue/Wilfred Avenue
- Labath Avenue/Wilfred Avenue
- Dowdell Avenue/Wilfred Avenue
- Redwood Drive/Wilfred Avenue
- Golf Course Drive/Commerce Boulevard
- Commerce Boulevard/US-101 NB Ramps

Table H-sub1 2 – Variant H-sub1 Levels of Service

	Intersection	Criteria	Signal Control	2005		2008				2020			
				Existing		Base (w/o Proj.)		With Project		Base (w/o Proj.)		With Project	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	D	25.2	B	12.5	E	40.3
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	1325.1	F	OVRFL	F	OVRFL
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	709.3	F	OVRFL	F	OVRFL
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	101.9	F	169.9	F	137.9
10	Golf Course Dr/Commerce Blvd	D	TS	F	103.4	E	71.7	F	87.3	E	74.2	F	89.3
12	Commerce Blvd/US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	67.3	D	50.8	E	59.5
17	Rohnert Park Expwy/Labath Ave	C	TS	C	24.6	C	25.8	C	33.2	C	28.2	C	31.8
20	Rohnert Park Expwy/US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	16.5	B	12.3	B	15.7
21	Rohnert Park Expwy/Commerce Blvd	C	TS	D	39.2	D	44.6	D	40.2	E	63.4	C	33.8

Variant H-sub1 Traffic Signal Warrant Analysis

Variant H-sub1, near-term and long-term, traffic volumes at the unsignalized study intersection of Langer Avenue/Wilfred Avenue were compared against peak hour warrant in the *2003 Manual on Uniform Traffic Control Devices (MUTCD)* and the *California Supplement*. Results of the analysis showed that the intersection will not satisfy traffic signal Warrant #3 in the year 2008 or 2020.

Other warrants such as for minimum vehicle volumes, interruption of continuous traffic, and traffic progression were not evaluated because they generally require higher traffic volumes to be satisfied. Accident history and school areas were also not evaluated based on the results of field observations, which noted that neither of these warrant thresholds was likely to be met. A copy of the analysis summary for Warrant #3 is included in the **Appendix**.

Variant H-sub1 LOS Conditions and Impacts on Freeway and Ramps

Project trips generated by the proposed Variant H-sub1, reduced-intensity casino and hotel were added to the year 2008 and 2020 forecast freeway volumes.

Traffic analyses were completed to evaluate the operation of the study freeway segments and ramps in the year 2008 and 2020, with the addition on the casino and hotel project. Freeway segment analyses were limited to the mix-use travel lanes which are expected to have significantly more congestion than the future HOV lanes.

Results of the analyses are presented in **Table H-sub1 3**. (Results shown as bold in the table do not meet operational standards.) As shown in the table, project traffic will add to the background congestion of the freeway. Significant congestion is expected with the project; however the congestion is reduced as a result of the smaller casino and hotel.

Table H-sub1 3 – Variant H-sub1 Freeway Levels of Service

Northbound											
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	24.5	C	25.6	D	34.0
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	33.1	D	34.1	E	39.8
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.1	E	40.4	E	40.2
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.1	E	40.4	E	40.2
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.1	E	40.4	E	40.2
Southbound											
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	41.8	E	39.9	F	46.3
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	41.8	E	39.9	F	46.3
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	41.8	E	39.9	F	46.3
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.4	E	38.5	F	41.1
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	34.5	F	37.5	F	41.9
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	27.5	E	36.6	F	-
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	34.3	F	40.3	F	45.4

Queuing Summary

As congestion increases it is common for traffic at signals and stop signs to form lines of stopped (or queued) vehicles. Queue lengths were determined for each lane and measure the distance that vehicles will backup in each direction approaching an intersection. The 95th percentile queue is calculated by using 95th percentile traffic to account for fluctuations in traffic and represents a condition where 95 percent of the time during the peak period, traffic volumes and related queuing will be at, or less, than determined by the analysis. Average queuing is generally less. Ninety-fifth percentile queuing was checked under the various future year development conditions and in consideration of the planned intersection and signal timing improvements. A typical vehicle length of 25 feet is used in the queuing analysis. A summary of the queuing results can be seen in **Table H-sub1 4**. The results indicate dedicated turn lanes where queuing may exceed their storage limits. It should be noted that some variations in intersection queuing between scenarios is a result of planned intersection and signal timing improvements.

Table H-sub1 4 – Variant H-sub1 Queuing Summary

Intersection	Turning Movement	Bay Length	Queue Length	
			2008	2020
17 Labath Avenue and Rohnert Park Expy	EBL	160	61	67
	EBR	200	<25	26
	WBL	250	77	42
	WBR	170	<25	<25
	NBL	130	36	38
	NBR	130	36	33
	SBL	100	494	466
	SBR			
20 NB US 101 Ramps and Rohnert Park Expy	EBL	190	<25	<25
	EBR			
	WBL			
	WBR			
	NBL	225	370	422
	NBR			
	SBL			
	SBR			

Variant H-sub1 Mitigations

Intersections with levels of service below established thresholds were investigated to determine the role of the Variant H-sub1 traffic in the projected operating conditions at those intersections. The evaluation disclosed that the following improvements as shown in **Table H-sub1 5** are needed in the near-term (2008) and long-term (2020).

Table H-sub1 6 summarizes the expected levels of service with the proposed mitigation. Roadway improvements will be consistent with design standards for local jurisdictions in providing facilities and amenities for bicycles and pedestrians. This includes improvements such as sidewalks, countdown signals, and striped crosswalks if required by local design standards.

As mentioned previously, the signal control is listed as TS for a signalized intersection and TWSC for a two-way stop-controlled intersection. Two-way stop-controlled (TWSC) intersections maybe operate acceptably overall but only the worst approach is reported in the table. The overall level of service is reported for signalized intersections. Some mitigations are associated with queuing impacts.

Traffic signal interconnect and coordinated timing plans are included in the proposed traffic signals for Wilfred Avenue.

The combination of casino traffic and other nearby future development will require Wilfred Avenue to ultimately be widened to five lanes (including Class II bike lanes) from Redwood Drive to Langner Avenue at the edge of the project site. From Langner Avenue west to Stony Point Road, Wilfred Avenue should be two lanes with improved pavement and shoulders and it is recommended that the upgrade of Wilfred Avenue to include improved pavement and shoulders should be designed to the County standard and should include Class II bike lanes out to Stony Point Road to connect into the Class II bike lanes on Stony Point Road. Casino traffic alone can be accommodated on a three lane roadway section from Redwood Drive to Langner Avenue, therefore, they will contribute a proportionate share for the ultimate cost of the widening of Wilfred Avenue.

Langner Avenue and Labath Avenue should be improved and either removed from County jurisdiction or designed to the County standard.

An overcrossing should be built from State Farm Drive to Business Park Drive over US-101 with a southbound slip ramp lane that would open up just south of the US-101 NB off-ramp directly to the overcrossing. The overcrossing helps redirect project traffic away from the Wilfred interchange to a new facility capable of accommodating casino traffic. Additional right-of-way is necessary on State Farm Drive as well as Business Park Drive. Access to State Farm Drive will need to be modified and adjusted, but it is not anticipated that there will need to be any closures associated with the overcrossing. The overcrossing should begin east of the State Farm Drive/Commerce Boulevard intersection and touch down west of the Business Park Drive/Redwood Drive intersection. With this mitigation, all of the existing turning movements at the

Commerce/State Farm and the Redwood/Business Park intersections will be permitted as they currently exist.

Modification to any interchanges requires review and approval from Caltrans' Department Headquarters Division of Design.

Table H-sub1 5 – Variant H-sub1 Summary of Mitigations

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2008	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Add WB left and change WB all shared to through-right ¹ Add NB right and change NB all shared to left-through 	No Yes Yes	Capacity Capacity Tribeland
	6	Dowdell Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize Add WB left and change WB all shared to through-right ¹ Add EB left and change EB all shared to through-right ¹ 	No Yes Yes	Capacity Capacity Capacity
	7	Redwood Dr/ Wilfred Ave	<ul style="list-style-type: none"> Change WB left-through to WB through Change phasing east-west to protected from split Optimize signal timing Add EB left and change EB all shared to through-right ¹ 	No No No Yes	Capacity Capacity Capacity Capacity
	10	Golf Course Dr/ Commerce Blvd	No mitigation necessary	-	-
	12	Commerce Blvd/ US-101 NB Ramps	Construct the State Farm-Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing	Yes	Capacity
	17	Rohnert Park Expwy/ Labath Ave	Extend SB left turn bay to 350 feet (from 100 feet)	Yes	Queue
	20	Rohnert Park Expwy/ US-101 NB Ramps	<ul style="list-style-type: none"> Extend NB left turn bay to 400 feet (from 225 feet) Add second NB left turn lane 	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	<ul style="list-style-type: none"> Add an EB right turn overlap phase Optimize signal timing 	Yes No	Capacity Capacity

¹ In summary, widen Wilfred Ave to three lanes from Labath Ave to Redwood Dr

Period	#	Intersection	Mitigation	Requires ROW?	Reason
2020	4	Langer Ave/ Wilfred Ave	No mitigation necessary	-	-
	5	Labath Ave/ Wilfred Ave	<ul style="list-style-type: none"> Signalize * Add NB right and change NB all shared to left-through * 	No Yes	Capacity Tribeland
	6	Dowdell Ave/ Wilfred Ave	Signalize *	No	Capacity
	7	Redwood Dr/ Wilfred Ave	<ul style="list-style-type: none"> Optimize signal timing * Change WB left-through to WB through * Change phasing east-west to protected from split * 	No No No	Capacity Capacity Capacity
	10	Golf Course Dr/ Commerce Blvd	Add EB right turn overlap phase	No	Capacity
	12	Commerce Blvd/ US-101 NB Ramps	Construct the State Farm-Business Park Overcrossing and a southbound slip ramp from the US-101 NB Ramps to the overcrossing *	Yes	Capacity
	17	Rohnert Park Expwy/ Labath Ave	Extend SB left turn bay to 350 feet (from 100 feet) *	Yes	Queue
	20	Rohnert Park Expwy/ US-101 NB Ramps	<ul style="list-style-type: none"> Extend NB left turn bay to 400 feet (from 225 feet) * Add second NB left turn lane * 	Yes Yes	Queue Capacity
	21	Rohnert Park Expwy/ Commerce Blvd	No mitigation necessary	-	-

* Improvement assumed to occur with 2008 mitigation

Table H-sub1 6 – Variant H-sub1 Mitigated Intersection Levels of Service

	Intersection	Criteria	Signal Control	2005		2008						2020					
				Existing		Base (w/o Proj.)		With Project		Mitigated		Base (w/o Proj.)		With Project		Mitigated	
				LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
4	Langer Ave/Wilfred Ave	D	TWSC	A	9.4	B	11.3	D	25.2	C	18.8	B	12.5	E	40.3	D	26.0
5	Labath Ave/Wilfred Ave	D	TWSC	A	9.1	F	77.4	F	1325.1	C	26.8	F	OVRFL	F	OVRFL	C	27.3
6	Dowdell Ave/Wilfred Ave	D	TWSC	A	9.1	F	623.3	F	709.3	C	23.1	F	OVRFL	F	OVRFL	C	33.8
7	Redwood Dr/Wilfred Ave	D	TS	C	23.3	E	77.6	F	101.9	D	41.0	F	169.9	F	137.9	D	53.7
10	Golf Course Dr/Commerce Blvd	D	TS	F	103.4	E	71.7	F	87.3	D	53.4	E	74.2	F	89.3	D	54.1
12	Commerce Blvd/US-101 NB Ramps	D	TS	C	28.2	D	46.7	E	67.3	D	49.1	D	50.8	E	59.5	D	43.1
17	Rohnert Park Expwy/Labath Ave	C	TS	C	24.6	C	25.8	C	33.2	C	33.2	C	28.2	C	31.8	C	31.8
20	Rohnert Park Expwy/US-101 NB Ramps	D	TS	A	9.8	B	10.8	B	16.5	B	11.8	B	12.3	B	15.7	B	12.8
21	Rohnert Park Expwy/Commerce Blvd	C	TS	D	39.2	D	44.6	D	40.2	C	30.9	E	63.4	C	33.8	C	33.7

Only the intersections of Rohnert Park Expressway/Labath Avenue and Rohnert Park Expressway/US-101 NB Ramps have mitigations for Variant H-sub1 that are different from Alternative H.

Results indicate that the freeway will not meet standards with the project, even with the future construction of HOV lanes, ramp metering, and auxiliary lanes associated with the Wilfred interchange project. As mitigation the project should do the following which will result in the mitigated levels of service shown in **Table H-sub1 7**:

- The project should contribute a proportionate share of the costs of the construction of auxiliary lanes between Rohnert Park Expressway and Gravenstein Highway (SR-116) in the long-term (2020).
- The project should contribute a proportionate share of the costs of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes in the near-term (2008).
- The project should contribute a proportionate share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Rohnert Park Expressway and from Gravenstein Highway (SR-116) to West Sierra Avenue in the long-term (2020).

The freeway mitigations for Variant H-sub1 are the same as for Alternative H.

Aside from roadway improvements to mitigate protect impacts, the casino and hotel should coordinate with the Green Music Center during outdoor events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park interchange may be necessary. Therefore, the casino/hotel project should provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generate high traffic levels. If conflicts occur,

the project should provide traffic management coordination between the casino/hotel project and Green Music Center in consultation with CHP and Caltrans to assist in traffic control.

Because no fixed route service will be available at the project site, the casino/hotel should provide a shuttle that serves the two Rohnert Park transfer stations. The shuttle should run throughout the day or could be called out on demand.

The casino should also sponsor charter buses from farther away destinations such as Marin County and the south Bay. The buses could serve specific groups such as senior citizens or social clubs, while reducing the number of single occupancy vehicles to the site. Preferential carpool or vanpool spaces should also be provided at the project site to encourage ridesharing by patrons and employees. The casino should provide employee incentives such as subsidized transit passes, flexible work schedules, the validation of transit tickets to provide free return trips, or subsidized shuttle services.

It is recommended that the casino contribute to the operation of SMART if it is implemented. Implementation of the SMART transit option will reduce the commuter congestion on US-101.

Mitigations to reduce the impact of the construction include the implementation of a construction traffic management plan for the duration of construction of the project and training for construction delivery vehicle drivers.

It is recommended that the project attempt to minimize the amount of construction fill transported on the surrounding street network by eliminating or shortening the off-site travel route. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.

If there is a special exception and off-site fill is necessary, construction material importation should be scheduled outside of the areawide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways should be cleaned as necessary. Roadways subject to fill truck traffic should be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, it is recommended that the developer pay to have surrounding roadways resurfaced to restore the pavement to the pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements.

To help ensure adequate public safety during construction, particularly near the project site, the tribe should provide flagging when necessary in consultation with CHP, Caltrans, and the County's Sheriff's Department to assist with traffic control.

Table H-sub1 7 – Variant H-sub1 Mitigated Freeway Level of Service Summary

US-101 Section/Ramp	Criteria	Existing		2008		2008 + Alt H.1		2008 + Alt H.1 Mitigated		2020		2020 + Alt H.1		2020 + Alt H.1 Mitigated	
	LOS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Northbound															
US-101 South of Gravenstein Highway (NB)	E	C	22.2	C	19.1	C	24.5	C	24.5	C	25.6	D	34.0	D	34.0
Gravenstein Highway NB Off-Ramp	E	D	30.8	C	27.4	D	33.1	D	33.1	D	34.1	E	39.8	E	39.8
Wilfred Avenue NB On-Ramp	E	F	42.0	D	30.3	D	33.1	D	33.1	E	40.4	E	40.2	E	40.2
US-101 Between Wilfred Avenue and Santa Rosa Avenue (NB)	E	D	26.7	D	30.3	D	33.1	D	33.1	E	40.4	E	40.2	E	40.2
Santa Rosa Avenue NB Off-Ramp	E	E	37.2	D	30.3	D	33.1	D	33.1	E	40.4	E	40.2	E	40.2
Southbound															
Wilfred Avenue SB On-Ramp	E	D	33.7	D	33.4	E	41.8	E	41.8	E	39.9	F	46.3	D	33.1
US-101 Between Rohnert Park Expressway and Wilfred Avenue (SB)	E	E	35.2	D	33.4	E	41.8	E	41.8	E	39.9	F	46.3	D	33.1
Rohnert Park Expressway SB Off-Ramp	E	E	38.0	D	33.4	E	41.8	E	41.8	E	39.9	F	46.3	D	33.1
Rohnert Park Expressway SB On-Ramp (Loop Ramp)	E	E	36.0	D	30.9	D	33.4	D	33.4	E	38.5	F	41.1	C	26.2
Rohnert Park Expressway SB On-Ramp	E	E	35.1	D	30.1	D	34.5	D	34.5	F	37.5	F	41.9	E	39.4
US-101 Between Rohnert Park Expressway and Gravenstein Highway (SB)	E	D	27.1	C	22.3	D	27.5	D	27.5	E	36.6	F	-	E	39.4
Gravenstein Highway SB Off-Ramp	E	D	33.9	D	29.2	D	34.3	D	34.3	F	40.3	F	45.4	E	39.4

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- Telephone communication with David Stewart, Utility Engineer, Consumer Protection and Safety Division, Rail Crossings Engineering Section, Public Utilities Commission, December 14, 2006.
- Telephone communication with Suzanne Smith, Sonoma County Transportation Authority, December 2006.

APPENDIX

APPENDIX

TURNING MOVEMENT VOLUMES

EXISTING CONDITIONS

NEAR-TERM 2008 NO ACTION TRAFFIC CONDITIONS

CUMULATIVE 2020 NO ACTION TRAFFIC CONDITIONS

TRIP GENERATION – ALTERNATIVES A, B & C

TRIP GENERATION – ALTERNATIVE D & H

TRIP GENERATION – ALTERNATIVE E

TRIP GENERATION – VARIANT H-SUB1

NEAR TERM 2008 + ALTERNATIVE A TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE A TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE B TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE B TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE C TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE C TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE D TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE D TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE E TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE E TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE H TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE H TRAFFIC CONDITIONS

NEAR-TERM 2008 + VARIANT H-SUB1 TRAFFIC CONDITIONS

CUMULATIVE 2020 + VARIANT H-SUB1 TRAFFIC CONDITIONS

SIGNAL WARRANT ANALYSIS – NO BUILD

SIGNAL WARRANT ANALYSIS – ALTERNATIVE A

SIGNAL WARRANT ANALYSIS – ALTERNATIVE B

SIGNAL WARRANT ANALYSIS – ALTERNATIVE C

SIGNAL WARRANT ANALYSIS – ALTERNATIVE D

SIGNAL WARRANT ANALYSIS – ALTERNATIVE E

SIGNAL WARRANT ANALYSIS – ALTERNATIVE H

SIGNAL WARRANT ANALYSIS – VARIANT H-SUB1

NEAR TERM 2008 + ALTERNATIVE A MITIGATED TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE A MITIGATED TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE B MITIGATED TRAFFIC CONDITIONS

CUMULATIVE 2020 + ALTERNATIVE B MITIGATED TRAFFIC CONDITIONS

NEAR TERM 2008 + ALTERNATIVE C MITIGATED TRAFFIC CONDITIONS
CUMULATIVE 2020 + ALTERNATIVE C MITIGATED TRAFFIC CONDITIONS
NEAR TERM 2008 + ALTERNATIVE D MITIGATED TRAFFIC CONDITIONS
CUMULATIVE 2020 + ALTERNATIVE D MITIGATED TRAFFIC CONDITIONS
NEAR TERM 2008 + ALTERNATIVE E MITIGATED TRAFFIC CONDITIONS
CUMULATIVE 2020 + ALTERNATIVE E MITIGATED TRAFFIC CONDITIONS
NEAR TERM 2008 + ALTERNATIVE H MITIGATED TRAFFIC CONDITIONS
CUMULATIVE 2020 + ALTERNATIVE H MITIGATED TRAFFIC CONDITIONS
NEAR-TERM 2008 + VARIANT H-SUB1 MITIGATED TRAFFIC CONDITIONS
CUMULATIVE 2020 + VARIANT H-SUB1 MITIGATED TRAFFIC CONDITIONS

TURNING MOVEMENT VOLUMES

All Traffic Data

5098 Foothills Blvd. 3-302

Roseville, CA. 95678

(916) 771-8700

Site Code : 00000000

Start Date: 08/24/05

File I.D. : R16

Page : 1

CITY OF ROHNERT PARK

STONY POINT ROAD

ROHNERT PARK EXPRESSWAY

Southbound

Westbound

Northbound

Eastbound

Start

Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	25	64	0	89	34	0	19	53	0	47	23	70	0	0	0	0	212
7:15	33	88	0	121	22	0	33	55	0	59	25	84	0	0	0	0	260
7:30	50	113	0	163	18	0	30	48	0	72	24	96	0	0	0	0	307
7:45	49	103	0	152	18	0	34	52	0	65	37	102	0	0	0	0	306
Hour Total	157	368	0	525	92	0	116	208	0	243	109	352	0	0	0	0	1065

8:00am	32	78	0	110	26	0	34	60	0	61	23	84	0	0	0	0	254
8:15	54	62	0	116	16	0	27	43	0	77	44	121	0	0	0	0	280
8:30	43	71	0	114	16	0	24	40	0	59	45	104	0	0	0	0	258
8:45	35	61	0	96	16	0	34	50	0	47	45	92	0	0	0	0	238
Hour Total	164	272	0	436	74	0	119	193	0	244	157	401	0	0	0	0	1030

Grand 321 640 0 961 166 0 235 401 0 487 266 753 0 0 0 0 0 2115

% of Total 15.2% 30.3% 0.0% 7.6% 0.0% 11.1% 0.0% 23.0% 12.6% 0.0% 0.0% 0.0%

Approch % 45.4% 19.0% 35.6%

% of Approch 33.4% 66.6% 0.0% 41.4% 0.0% 58.6% 0.0% 64.7% 35.3% 0.0% 0.0% 0.0%

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 08/24/05

Direction	Street Name	Start	Peak Hr	Factor	Left	Thru	Right	Total	Left	Thru	Right	Percentages
Southbound	STONY POINT ROAD	07:30am	.830		185	356	0	541	34.1	65.8	.0	.0
Westbound	ROHNERT PARK EXPRESSWAY		.546		78	0	125	203	38.4	.0	61.5	.0
Northbound			.533		0	275	128	403	.0	68.2	31.7	.0
Eastbound			.0		0	0	0	0	0.0	0.0	0.0	0.0

All Traffic Data

5098 Foothills Blvd. 3-302

Roseville, CA. 95678

(916)771-8700

Site Code : 00000000

Start Date: 08/24/05

File I.D. : R16

Page : 2

CITY OF ROHNERT PARK

STONY	POINT	ROAD	
0	356	185	0
			275
			125
			====
			400
	Inbound	541	
	Outbound	400	
	Total	941	

125

0
0
0
0

0

Inbound 0
Outbound 0
0 Total 0

Inbound 203
Outbound 313 78
Total 516

0

185
0 313
128

Inbound 403
Outbound 434
Total 837

78
356
0
====
434

0 275

128

ROHNERT PARK EXPRESSWAY

All Traffic Data

5098 Foothills Blvd. 3-302
 Roseville, CA. 95678
 (916) 771-8700

Site Code : 00000000
 Start Date: 08/24/05
 File I.D. : R16
 Page : 1

CITY OF ROHNERT PARK

STONY POINT ROAD					ROHNERT PARK EXPRESSWAY											
Southbound					Westbound				Northbound				Eastbound			
Start	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
4:00pm	45	80	0	125	72	0	76	150	0	130	49	179	0	0	0	454
4:15	47	76	0	123	76	0	70	146	0	129	65	194	0	0	0	463
4:30	61	99	0	160	77	0	85	162	0	129	61	190	0	0	0	512
4:45	48	80	0	128	71	0	78	149	0	124	65	189	0	0	0	466
Hour Total	201	335	0	536	296	0	311	607	0	512	240	752	0	0	0	1895
5:00pm	40	85	0	133	65	0	86	153	0	141	60	201	0	0	0	487
5:15	63	89	0	152	74	0	66	140	0	117	50	167	0	0	0	459
5:30	64	78	0	142	58	0	58	116	0	125	56	181	0	0	0	439
5:45	44	56	0	100	64	0	51	115	0	107	53	160	0	0	0	375
Hour Total	219	308	0	527	261	0	263	524	0	490	219	709	0	0	0	1760
Grand	420	643	0	1063	557	0	574	1131	0	1002	459	1461	0	0	0	3655
% of Total	11.5%	17.6%	0.0%		15.2%	0.0%	15.7%		0.0%	27.4%	12.6%		0.0%	0.0%	0.0%	
Approch %				29.1%				30.9%				40.0%				
% of Approach	39.5%	60.5%	0.0%		49.2%	0.0%	50.8%		0.0%	68.6%	31.4%		0.0%	0.0%	0.0%	

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 08/24/05

		Start	Peak Hr	..... Volumes .....				..... Percentages			
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right	
Southbound	STONY POINT ROAD	04:15pm	.850	204	340	0	544	37.5	62.5	.0	.0
Westbound	ROHNERT PARK EXPRESSWAY		.941	289	0	321	610	47.3	.0	52.6	.0
Northbound			.963	0	523	251	774	.0	67.5	32.4	.0
Eastbound			.0	0	0	0	0	0.0	0.0	0.0	0.0

CITY OF ROHNERT PARK

All Traffic Data
 5098 Foothills Blvd. 3-302
 Roseville, CA. 95678
 (916) 771-0700

Site Code : 00000000
 Start Date: 08/24/05
 File I.D. : R16
 Page : 2

STONY POINT ROAD

0	340	204	0
			523
			321
			=====
			844
Inbound			544
Outbound			844
Total			1388

321

0

0

0

0

0

Inbound	0
Outbound	0
0 Total	0

Inbound	610
Outbound	455 289
Total	1065

204

0

455

251

ROHNERT PARK EXPRESSWAY

Inbound	774
Outbound	629
Total	1403
289	0 523
340	
0	
=====	
629	

251

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/21/05

File I.D. : 14

Page : 1

	REDWOOD DRIVE				ROHNERT PARK EXPRESSWAY												
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Totl	Left	Thru	Right	Totl	Left	Thru	Right	Totl	Left	Thru	Right	Totl	Total
7:00am	22	10	1	33	31	87	22	140	11	5	36	52	7	51	4	62	287
7:15	27	12	9	48	33	87	34	154	16	14	36	66	12	62	17	91	359
7:30	29	15	17	61	52	109	28	189	5	5	57	67	15	81	6	102	419
7:45	18	20	14	52	68	126	51	245	14	12	43	69	8	116	10	134	500
Hour Total	96	57	41	194	184	409	135	728	46	36	172	254	42	310	37	389	1565
8:00am	33	18	17	68	57	126	38	221	11	15	32	58	10	85	20	115	462
8:15	31	18	16	65	56	109	33	198	18	15	32	65	13	101	19	133	461
8:30	37	18	17	72	47	104	33	184	17	17	38	72	12	109	17	138	466
8:45	44	21	17	82	71	125	56	252	14	17	47	78	21	92	12	125	537
Hour Total	145	75	67	287	231	464	160	855	60	64	149	273	56	387	68	511	1926
Grand	241	132	108	481	415	873	295	1583	106	100	321	527	98	697	105	900	3491
% of Total	6.9%	3.8%	3.1%		11.9%	25.0%	8.5%		3.0%	2.9%	9.2%		2.8%	20.0%	3.0%		
Approch %				13.8%				45.3%				15.1%				25.8%	
% of Approach	50.1%	27.4%	22.5%		26.2%	55.1%	18.6%		20.1%	19.0%	60.9%		10.9%	77.4%	11.7%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/21/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	08:00am	.875	145	75	67	287	50.5	26.1	23.3
Westbound	ROHNERT PARK EXPRESSWAY		.848	231	464	160	855	27.0	54.2	18.7
Northbound			.875	60	64	149	273	21.9	23.4	54.5
Eastbound			.926	56	387	68	511	10.9	75.7	13.3

REDWOOD DRIVE		
67	75	145
		56
		64
		160
		=====
		280
	Inbound	287
	Outbound	280
	Total	567

160

	60
591	464
	67

56

464

	Inbound	511
	Outbound	591
387	Total	1102

68

Inbound	855
Outbound	681
Total	1536

145
387
149
681

Inbound	273
Outbound	374
Total	647

231	60	64
75		
68		
=====		
374		

ROHNERT PARK EXPRESSWAY

149

REDWOOD DRIVE					ROHNERT PARK EXPRESSWAY												
Southbound					Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	97	39	66	202	80	145	83	308	18	35	79	132	55	199	21	275	917
4:15	102	55	60	217	67	142	77	286	22	42	87	151	52	213	34	299	953
4:30	100	48	54	202	79	141	104	324	24	37	98	159	41	179	29	249	934
4:45	109	48	61	218	71	145	88	304	23	36	77	136	52	152	21	225	883
Hour Total	408	190	241	839	297	573	352	1222	87	150	341	578	200	743	105	1048	3687
5:00pm	121	54	57	232	100	135	92	327	20	42	78	140	58	204	29	291	990
5:15	110	64	74	248	73	147	79	299	20	38	77	135	47	157	21	225	907
5:30	112	56	71	239	86	133	92	311	18	25	64	107	45	165	20	230	887
5:45	97	73	69	239	93	154	93	340	23	31	76	130	64	145	18	227	931
Hour Total	435	247	271	953	352	569	356	1277	81	136	295	512	214	671	88	973	3715
Grand	843	437	512	1792	649	1142	708	2499	168	286	636	1090	414	1414	193	2021	7402
% of Total	11.4%	5.9%	6.9%		8.8%	15.4%	9.6%		2.3%	3.9%	8.6%		5.6%	19.1%	2.6%		
Approch %				24.2%				33.8%				14.7%				27.3%	
% of Approach	47.0%	24.4%	28.6%		26.0%	45.7%	28.3%		15.4%	26.2%	58.3%		20.5%	70.0%	9.5%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/21/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	04:15pm	.936	432	205	232	869	49.7	23.5	26.6
Westbound	ROHNERT PARK EXPRESSWAY		.949	317	563	361	1241	25.5	45.3	29.0
Northbound			.921	89	157	340	586	15.1	26.7	58.0
Eastbound			.890	203	748	113	1064	19.0	70.3	10.6

REDWOOD DRIVE

232	205	432	203
			157
			361
			=====
			721
	Inbound	869	
	Outbound	721	
	Total	1590	

361

	89
884	563
	232

203

563

	Inbound	1064
	Outbound	884
748	Total	1948

113

	Inbound	1241
	Outbound	1520
	Total	2761

432
748
1520
340

	Inbound	586
	Outbound	635
	Total	1221
317		89
205		157
113		
=====		
635		

ROHNERT PARK EXPRESSWAY
340

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/21/05

File I.D. : 15

Page : 1

LABATH AVENUE					ROHNERT PARK EXPRESSWAY												
Southbound					Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	10	1	2	13	7	43	25	75	5	4	18	27	14	38	6	58	173
7:15	14	1	3	18	3	36	40	79	3	6	9	18	12	54	11	77	192
7:30	15	1	7	23	10	58	27	95	4	4	5	13	14	64	7	85	216
7:45	22	5	5	32	4	37	57	98	6	15	12	33	25	80	8	113	276
Hour Total	61	8	17	86	24	174	149	347	18	29	44	91	65	236	32	333	857
8:00am	26	5	2	33	13	51	49	113	4	11	9	24	25	66	7	98	268
8:15	32	3	6	41	17	40	45	102	7	8	12	27	20	62	3	85	255
8:30	19	5	8	32	20	32	40	92	2	6	22	30	11	67	11	89	243
8:45	17	10	5	32	26	37	34	97	4	7	21	32	10	67	7	84	245
Hour Total	94	23	21	138	76	160	168	404	17	32	64	113	66	262	28	356	1011
Grand	155	31	38	224	100	334	317	751	35	61	108	204	131	498	60	689	1868
% of Total	8.3%	1.7%	2.0%		5.4%	17.9%	17.0%		1.9%	3.3%	5.8%		7.0%	26.7%	3.2%		
Approch %				12.0%				40.2%				10.9%				36.9%	
% of Approach	69.2%	13.8%	17.0%		13.3%	44.5%	42.2%		17.2%	29.9%	52.9%		19.0%	72.3%	8.7%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/21/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	LABATH AVENUE	07:45am	.841	99	18	21	138	71.7	13.0	15.2
Westbound	ROHNERT PARK EXPRESSWAY		.896	54	160	191	405	13.3	39.5	47.1
Northbound			.864	19	40	55	114	16.6	35.0	48.2
Eastbound			.852	81	275	29	385	21.0	71.4	7.5

LABATH AVENUE

21	18	99	81
			40
			191
			=====
			312
	Inbound	138	
	Outbound	312	
	Total	450	

191

	19
200	160
	21

81

160

	Inbound	385
	Outbound	200
275	Total	585

Inbound	405
Outbound	429
Total	834

29

99
275
55
429

Inbound	114
Outbound	101
Total	215
54	19
18	40
29	
=====	
101	

ROHNERT PARK EXPRESSWAY

55

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/21/05

File I.D. : 15

Page : 1

LABATH AVENUE					ROHNERT PARK EXPRESSWAY												
Southbound					Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	62	9	25	96	30	106	13	149	14	3	26	43	6	118	6	130	418
4:15	45	8	23	76	21	120	14	155	17	3	46	66	14	149	7	170	467
4:30	72	12	30	114	30	120	10	160	15	6	26	47	6	107	13	126	447
4:45	41	8	14	63	41	121	12	174	17	4	19	40	7	117	10	134	411
Hour Total	220	37	92	349	122	467	49	638	63	16	117	196	33	491	36	560	1743
5:00pm	78	17	34	129	24	129	15	168	12	0	32	44	9	158	14	181	522
5:15	37	7	11	55	24	105	11	140	16	3	22	41	5	105	10	120	356
5:30	25	11	11	47	25	124	5	154	10	3	17	30	1	118	22	141	372
5:45	22	4	7	33	35	136	7	178	24	4	27	55	5	138	18	161	427
Hour Total	162	39	63	264	108	494	38	640	62	10	98	170	20	519	64	603	1677
Grand	382	76	155	613	230	961	87	1278	125	26	215	366	53	1010	100	1163	3420
% of Total	11.2%	2.2%	4.5%		6.7%	28.1%	2.5%		3.7%	.8%	6.3%		1.5%	29.5%	2.9%		
Approch %				17.9%				37.4%				10.7%				34.0%	
% of Approach	62.3%	12.4%	25.3%		18.0%	75.2%	6.8%		34.2%	7.1%	58.7%		4.6%	86.8%	8.6%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/21/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	LABATH AVENUE	04:15pm	.740	236	45	101	382	61.7	11.7	26.4
Westbound	ROHNERT PARK EXPRESSWAY		.944	116	490	51	657	17.6	74.5	7.7
Northbound			.746	61	13	123	197	30.9	6.5	62.4
Eastbound			.844	36	531	44	611	5.8	86.9	7.2

LABATH AVENUE

101	45	236	36
			13
			51
			=====
			100
	Inbound	382	
	Outbound	100	
	Total	482	

	61
652	490
	101

36

	Inbound	611
	Outbound	652
531	Total	1263

44

	Inbound	197
	Outbound	205
	Total	402

116	61	13
45		
44		
=====		
205		

ROHNERT PARK EXPRESSWAY

123

51

490

	Inbound	657
	Outbound	890
	Total	1547

236
531
123
890

SR 101 NB RAMPS/PARK AND ROHNERT PARK EXPRESSWAY									SR 101 NB RAMPS									
Southbound				Westbound				Northbound				Eastbound						
Start																		
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	
7:00am	0	0	1	1	0	100	45	145	37	1	43	81	2	87	33	122	349	
7:15	0	0	0	0	0	129	39	168	41	0	35	76	2	158	55	215	459	
7:30	2	0	1	3	0	145	48	193	37	0	48	85	1	197	59	257	538	
7:45	0	0	0	0	0	160	41	201	57	1	91	149	2	241	49	292	642	
Hour Total	2	0	2	4	0	534	173	707	172	2	217	391	7	683	196	886	1988	
8:00am	2	0	0	2	0	185	31	216	51	0	62	113	0	165	48	213	544	
8:15	0	0	1	1	0	149	39	188	43	2	58	103	0	185	41	226	518	
8:30	0	0	0	0	0	151	49	200	39	1	61	101	1	196	49	246	547	
8:45	0	0	0	0	0	145	47	192	55	0	89	144	1	202	51	254	590	
Hour Total	2	0	1	3	0	630	166	796	188	3	270	461	2	748	189	939	2199	
Grand	4	0	3	7	0	1164	339	1503	360	5	487	852	9	1431	385	1825	4187	
% of Total	.1%	0.0%	.1%		0.0%	27.8%	8.1%		8.6%	.1%	11.6%		.2%	34.2%	9.2%			
Approch %				.2%				35.9%				20.3%				43.6%		
% of Approach	57.1%	0.0%	42.9%		0.0%	77.4%	22.6%		42.3%	.6%	57.2%		.5%	78.4%	21.1%			

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	SR 101 NB RAMPS/PARK AN	07:45am	.375	2	0	1	3	66.6	.0	33.3
Westbound	ROHNERT PARK EXPRESSWAY		.932	0	645	160	805	.0	80.1	19.8
Northbound	SR 101 NB RAMPS		.782	190	4	272	466	40.7	.8	58.3
Eastbound			.836	3	787	187	977	.3	80.5	19.1

SR 101 NB RAMPS/PARK AND RIDE

1	0	2	3
			4
			160
			=====
			167
	Inbound	3	
	Outbound	167	
	Total	170	

160

	190
836	645
	1

3

645

	Inbound	977
	Outbound	836
787	Total	1813

	Inbound	805
	Outbound	1061
	Total	1866

2

187

787	1061
272	

	Inbound	466
	Outbound	187
	Total	653

ROHNERT PARK EXPRESSWAY

0	190	4
0		
187		
=====		
187		

272

SR 101 NB RAMPS

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/20/05

File I.D. : 12

Page : 1

Start Time	SR 101 NB RAMPS/PARK AND ROHNERT PARK EXPRESSWAY Southbound				Westbound				SR 101 NB RAMPS Northbound				Eastbound				Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
4:00pm	3	0	1	4	0	192	52	244	42	0	79	121	5	355	67	427	796
4:15	2	0	2	4	0	252	82	334	64	0	60	124	5	391	64	460	922
4:30	0	0	1	1	0	262	73	335	74	0	79	153	3	387	67	457	946
4:45	7	0	0	7	0	260	64	324	56	0	74	130	4	398	51	453	914
Hour Total	12	0	4	16	0	966	271	1237	236	0	292	528	17	1531	249	1797	3578
5:00pm	5	0	0	5	0	211	96	307	68	0	49	117	3	481	65	549	978
5:15	6	0	2	8	0	205	88	293	57	0	61	118	5	402	76	483	902
5:30	5	0	0	5	0	225	73	298	65	1	63	129	6	364	75	445	877
5:45	2	0	0	2	0	210	53	263	73	1	69	143	4	356	42	402	810
Hour Total	18	0	2	20	0	851	310	1161	263	2	242	507	18	1603	258	1879	3567
Grand	30	0	6	36	0	1617	581	2398	499	2	534	1035	35	3134	507	3676	7145
% of Total	.4%	0.0%	.1%		0.0%	25.4%	8.1%		7.0%	0.0%	7.5%		.5%	43.9%	7.1%		
Approch %				.5%				33.6%				14.5%				51.4%	
% of Approach	83.3%	0.0%	16.7%		0.0%	75.8%	24.2%		48.2%	.2%	51.6%		1.0%	85.3%	13.8%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	SR 101 NB RAMPS/PARK AN	04:15pm	.607	14	0	3	17	82.3	.0	17.6
Westbound	ROHNERT PARK EXPRESSWAY		.970	0	985	315	1300	.0	75.7	24.2
Northbound	SR 101 NB RAMPS		.856	262	0	262	524	50.0	.0	50.0
Eastbound			.874	15	1657	247	1919	.7	86.3	12.8

SR 101 NB RAMPS/PARK AND RIDE

3	0	14	15
			0
			315
			=====
			330
	Inbound	17	
	Outbound	330	
	Total	347	

315

	262
1250	985
	3

15

985

	Inbound	1919
	Outbound	1250
1657	Total	3169

247

	Inbound	1300
	Outbound	1933
	Total	3233

0

14

1657 1933

262

	Inbound	524
	Outbound	247
	Total	771

ROHNERT PARK EXPRESSWAY

0	262	0	262
0			
247			
=====			
247			

SR 101 NB RAMPS

CITY OF ROHNERT PARK

Site Code : 00000060

Start Date: 07/20/05

File I.D. : 11

Page : 1

COMMERCE BLVD.					ROHNERT PARK EXPRESSWAY												
Southbound					Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	4	9	11	24	6	96	6	108	38	37	11	86	21	75	34	130	348
7:15	6	10	13	29	18	115	16	149	40	41	6	87	32	112	48	192	457
7:30	11	14	27	52	14	113	31	158	53	56	24	133	34	178	36	248	591
7:45	9	22	15	46	19	130	13	162	56	56	16	128	79	214	39	332	668
Hour Total	30	55	66	151	57	454	66	577	187	190	57	434	166	579	157	902	2064
8:00am	11	13	28	52	19	148	14	181	40	50	17	107	42	156	31	229	569
8:15	11	17	22	50	13	118	21	152	48	55	18	121	48	137	58	243	566
8:30	19	15	23	57	6	123	22	151	54	40	11	105	43	155	59	257	570
8:45	8	20	25	53	17	114	26	157	53	41	18	112	51	169	71	291	613
Hour Total	49	65	98	212	55	503	83	641	195	186	64	445	184	617	219	1020	2318
Grand	79	120	164	363	112	957	149	1218	382	376	121	879	350	1196	376	1922	4382
% of Total	1.8%	2.7%	3.7%		2.6%	21.8%	3.4%		8.7%	8.6%	2.8%		8.0%	27.3%	8.6%		
Approch %				8.3%				27.8%				20.1%					43.9%
% of Approach	21.8%	33.1%	45.2%		9.2%	78.6%	12.2%		43.5%	42.8%	13.6%		18.2%	62.2%	19.6%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	COMMERCE BLVD.	07:30am	.962	42	66	92	200	21.0	33.0	46.0
Westbound	ROHNERT PARK EXPRESSWAY		.902	65	509	79	653	9.9	77.9	12.0
Northbound			.919	197	217	75	489	40.2	44.3	15.3
Eastbound			.792	203	685	164	1052	19.2	65.1	15.5

COMMERCE BLVD.

92	66	42	203
			217
			79
			=====
			499
	Inbound	200	
	Outbound	499	
	Total	699	

	197
798	509
	92

203

	Inbound	1052
	Outbound	798
685	Total	1850

164

	Inbound	489
	Outbound	295
	Total	784
65	197	217
66		
164		
=====		
295		

ROHNERT PARK EXPRESSWAY

75

79

509

Inbound	653
Outbound	802
Total	1455

42
685
75
802

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/20/05

File I.D. : 11

Page : 1

	COMMERCE BLVD.				ROHNERT PARK EXPRESSWAY													
	Southbound				Westbound				Northbound				Eastbound					
Start																		
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	
4:00pm	24	67	31	122	30	133	27	190	80	83	52	215	66	247	124	437	964	
4:15	21	53	44	118	19	197	44	260	93	71	48	212	52	270	131	453	1043	
4:30	27	54	52	133	34	200	33	267	83	68	42	193	75	251	140	466	1059	
4:45	29	62	33	124	31	197	34	262	94	69	59	222	61	291	127	479	1087	
Hour Total	101	236	160	497	114	727	138	979	350	291	201	842	254	1059	522	1835	4153	
5:00pm	25	61	28	114	33	172	29	234	107	67	54	228	80	308	144	532	1108	
5:15	24	53	24	101	35	160	27	222	109	73	58	240	59	286	124	469	1032	
5:30	37	36	34	107	25	158	21	204	106	96	71	273	49	266	117	432	1016	
5:45	26	43	38	107	32	141	20	193	84	73	44	201	64	243	120	427	928	
Hour Total	112	193	124	429	125	631	97	853	406	309	227	942	252	1103	505	1860	4084	
Grand	213	429	284	926	239	1358	235	1832	756	600	428	1784	506	2162	1027	3695	8237	
% of Total	2.6%	5.2%	3.4%		2.9%	16.5%	2.9%		9.2%	7.3%	5.2%		6.1%	26.2%	12.5%			
Approch %				11.2%				22.2%				21.7%				44.9%		
% of Approach	23.0%	46.3%	30.7%		13.0%	74.1%	12.8%		42.4%	33.6%	24.0%		13.7%	58.5%	27.8%			

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	COMMERCE BLVD.	04:15pm	.919	102	230	157	489	20.8	47.0	32.1
Westbound	ROHNERT PARK EXPRESSWAY		.958	117	766	140	1023	11.4	74.8	13.6
Northbound			.938	377	275	203	855	44.0	32.1	23.7
Eastbound			.907	268	1120	542	1930	13.8	58.0	28.0

COMMERCE BLVD.

157	230	102	268
			275
			140
			=====
			683
	Inbound	489	
	Outbound	683	
	Total	1172	

	377
1300	766
	157

268

	Inbound	1930
	Outbound	1300
1120	Total	3230

542

	Inbound	855
	Outbound	889
	Total	1744
117		377
230		275
542		
=====		
889		

ROHNERT PARK EXPRESSWAY

203

140

766

Inbound	1023	
Outbound	1425	117
Total	2448	

102
1120 1425
203

SR 101 SB RAMPS					ROHNERT PARK EXPRESSWAY				SR 101 SB RAMPS/PARK AND RIDE								
Southbound					Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	67	1	52	120	5	94	39	138	0	0	0	0	0	55	32	87	345
7:15	104	0	62	166	11	106	53	170	1	0	0	1	0	111	27	138	475
7:30	127	11	74	212	17	106	60	183	0	0	3	3	0	127	37	164	562
7:45	127	1	103	231	9	169	39	217	1	0	0	1	0	163	48	213	662
Hour Total	425	13	291	729	42	475	191	708	2	0	3	5	0	458	144	602	2044
8:00am	82	3	71	156	20	146	70	236	0	0	2	2	0	129	32	161	555
8:15	102	0	73	175	14	140	39	193	0	0	2	2	0	122	45	167	537
8:30	115	0	66	181	14	127	49	190	0	0	0	0	0	131	46	177	548
8:45	109	1	85	195	9	149	42	200	0	0	0	0	0	143	35	180	575
Hour Total	408	4	295	707	57	562	200	819	0	0	4	4	0	527	158	685	2215
Grand	833	17	586	1436	99	1037	391	1527	2	0	7	9	0	985	302	1287	4259
% of Total	19.6%	.4%	13.8%		2.3%	24.3%	9.2%		0.0%	0.0%	.2%		0.0%	23.1%	7.1%		
Approch %			33.7%				35.9%					.2%				30.2%	
% of Approch	58.0%	1.2%	40.8%		6.5%	67.9%	25.6%		22.2%	0.0%	77.8%		0.0%	76.5%	23.5%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	SR 101 SB RAMPS	07:30am	.836	438	15	321	774	56.5	1.9	41.4
Westbound	ROHNERT PARK EXPRESSWAY		.878	60	561	208	829	7.2	67.6	25.0
Northbound	SR 101 SB RAMPS/PARK AN		.667	1	0	7	8	12.5	.0	87.5
Eastbound			.827	0	543	162	705	.0	77.0	22.9

SR 101	SB	RAMPS	
321	15	438	0
			0
			208
			=====
			208
	Inbound		774
	Outbound		208
	Total		982

208

1
 883 561
 321

0

Inbound 705
 Outbound 883
 543 Total 1588

162

Inbound 829
 Outbound 988 60
 Total 1817

561

438
 543 988
 7

Inbound	8
Outbound	237
Total	245
60	1
15	0
162	
=====	
237	
SR 101 SB	RAMPS/PARK AND RIDE

ROHNERT PARK EXPRESSWAY

7

SR 101 SB RAMPS				ROHNERT PARK EXPRESSWAY				SR 101 SB RAMPS/PARK AND RIDE									
Southbound				Westbound				Northbound				Eastbound					
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	162	1	73	236	19	182	34	235	0	0	0	0	0	265	80	345	816
4:15	163	0	79	242	13	258	47	318	1	0	3	4	0	294	67	361	925
4:30	184	0	102	286	18	264	55	337	0	0	0	0	0	273	68	341	964
4:45	150	0	65	215	13	251	52	316	0	0	11	11	0	292	65	357	899
Hour Total	659	1	319	979	63	955	188	1206	1	0	14	15	0	1124	280	1404	3604
5:00pm	195	1	73	269	24	210	45	279	5	0	3	8	0	351	65	416	972
5:15	188	0	74	262	12	204	48	264	0	0	2	2	0	293	63	356	884
5:30	161	0	86	247	17	229	44	290	2	0	10	12	0	274	72	346	895
5:45	150	0	80	230	20	227	36	283	3	0	5	8	0	247	57	304	825
Hour Total	694	1	313	1008	73	870	173	1116	10	0	20	30	0	1165	257	1422	3576
Grand	1353	2	632	1987	136	1825	361	2322	11	0	34	45	0	2289	537	2826	7180
% of Total	18.8%	0.0%	8.8%		1.9%	25.4%	5.0%		.2%	0.0%	.5%		0.0%	31.9%	7.5%		
Approch %				27.7%				32.3%				.6%				39.4%	
% of Approch	68.1%	.1%	31.8%		5.9%	78.6%	15.5%		24.4%	0.0%	75.6%		0.0%	81.0%	19.0%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	SR 101 SB RAMPS	04:15pm	.885	692	1	319	1012	68.3	.0	31.5
Westbound	ROHNERT PARK EXPRESSWAY		.927	68	983	199	1250	5.4	78.6	15.9
Northbound	SR 101 SB RAMPS/PARK AN		.523	6	0	17	23	26.0	.0	73.9
Eastbound			.886	0	1210	265	1475	.0	82.0	17.9

SR	101	SB	RAMPS
319	1	692	
			0
			0
			199
			=====
			199
		Inbound	1012
		Outbound	199
		Total	1211

	6
1308	983
	319
=====	
	0

199

983

	Inbound	1475
	Outbound	1308
1210	Total	2783

	Inbound	1250
	Outbound	1919
	Total	3169

265

692
1210
1919
17

Inbound	23
Outbound	334
Total	357

ROHNERT PARK EXPRESSWAY

68	6	0	17
1			
265			
=====			
334			

SR 101 SB RAMPS/PARK AND RIDE

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/20/05

File I.D. : 20

Page : 1

	REDWOOD DRIVE				GRAVENSTEIN HWY (SR 116)												
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	29	8	7	44	15	96	42	153	4	1	11	16	12	86	6	104	317
7:15	21	2	9	32	9	106	49	164	9	1	19	29	11	117	5	133	350
7:30	39	4	4	47	4	101	58	163	8	7	12	27	13	121	9	143	380
7:45	43	6	10	59	8	120	66	194	9	9	11	29	20	134	5	159	441
Hour Total	132	20	30	182	36	423	215	674	30	18	53	101	56	458	25	539	1496
8:00am	40	8	8	56	9	109	64	182	3	3	15	21	10	106	9	125	304
8:15	44	7	10	61	5	109	51	165	7	7	11	25	14	112	10	136	387
8:30	31	3	9	43	11	98	41	150	6	5	11	22	12	125	6	143	358
8:45	22	3	14	39	11	110	44	165	3	3	9	15	14	130	7	151	370
Hour Total	137	21	41	199	36	426	200	662	19	18	46	83	50	473	32	555	1499
Grand	269	41	71	381	72	849	415	1336	49	36	99	184	106	931	57	1094	2995
% of Total	9.0%	1.4%	2.4%		2.4%	28.3%	13.9%		1.6%	1.2%	3.3%		3.5%	31.1%	1.9%		
Approch %				12.7%				44.6%				6.1%				36.5%	
% of Approach	70.6%	10.8%	18.6%		5.4%	63.5%	31.1%		26.6%	19.6%	53.8%		9.7%	85.1%	5.2%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/20/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	07:30am	.914	166	25	32	223	74.4	11.2	14.3
Westbound	GRAVENSTEIN HWY (SR 116)		.907	26	439	239	704	3.6	62.3	33.9
Northbound			.879	27	26	49	102	26.4	25.4	48.0
Eastbound			.885	57	473	33	563	10.1	84.0	5.8

REDWOOD DRIVE

32	25	166	57
			26
			239
			=====
			322
	Inbound	223	
	Outbound	322	
	Total	545	

	27
498	439
	32

57

	Inbound	563
	Outbound	498
473	Total	1061

33

	Inbound	102
	Outbound	84
	Total	186

26	27	26
25		
33		
=====		
84		

GRAVENSTEIN HWY (SR 116)

49

239

439

Inbound	704
Outbound	688
Total	1392

166
473 688
49

	REDWOOD DRIVE				GRAVENSTEIN HWY (SR 116)													
	Southbound				Westbound				Northbound				Eastbound					
Start																		
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	
4:00pm	97	4	19	120	21	169	64	254	12	5	8	25	15	113	6	134	533	
4:15	83	8	14	105	13	144	58	215	13	7	19	39	20	132	12	164	523	
4:30	105	14	22	141	10	177	74	261	8	8	22	38	15	153	8	176	616	
4:45	91	2	27	120	9	173	53	235	15	2	14	31	28	127	6	161	547	
Hour Total	376	28	82	486	53	663	249	965	48	22	63	133	78	525	32	635	2219	
5:00pm	106	8	30	144	8	146	78	232	6	2	13	21	12	109	3	124	521	
5:15	73	6	15	94	8	150	63	221	8	6	3	17	13	156	3	172	504	
5:30	96	3	31	130	19	127	43	189	11	4	14	29	8	144	6	158	506	
5:45	57	9	20	86	10	142	55	207	9	3	8	20	20	103	6	129	442	
Hour Total	332	26	96	454	45	565	239	849	34	15	38	87	53	512	18	583	1973	
Grand	708	54	178	940	98	1228	488	1814	82	37	101	220	131	1037	50	1218	4192	
% of Total	16.9%	1.3%	4.2%		2.3%	29.3%	11.6%		2.0%	.9%	2.4%		3.1%	24.7%	1.2%			
Approch %				22.4%				43.3%				5.2%					29.1%	
% of Approach	75.3%	5.7%	18.9%		5.4%	67.7%	26.9%		37.3%	16.8%	45.9%		10.8%	85.1%	4.1%			

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/20/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	04:00pm	.862	376	28	82	486	77.3	5.7	16.8
Westbound	GRAVENSTEIN HWY (SR 116)		.924	53	663	249	965	5.4	68.7	25.8
Northbound			.853	48	22	63	133	36.0	16.5	47.3
Eastbound			.902	78	525	32	635	12.2	82.6	5.0

REDWOOD DRIVE

82	28	376	78
			22
			249
			=====
			349
	Inbound	486	
	Outbound	349	
	Total	835	

249

	48
793	663
	82

78

	Inbound	635
	Outbound	793
525	Total	1428

	Inbound	965
	Outbound	964
	Total	1929

663

32

	Inbound	133
	Outbound	113
	Total	246
	53	48
	28	22
	32	
	=====	
	113	

	376
	525
	63
	964

GRAVENSTEIN HWY (SR 116)

63

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/20/05

File I.D. : 19

Page : 1

	SR 101 SB OFF RAMP				GRAVENSTEIN HWY (SR 116)				SR 101 SB ON RAMP									
	Southbound				Westbound				Northbound				Eastbound					
Start																		
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	
7:00am	66	0	47	113	51	106	0	157	0	0	0	0	0	65	62	127	397	
7:15	48	0	59	107	45	105	0	150	0	0	0	0	0	91	66	157	414	
7:30	78	0	37	115	48	126	0	174	0	0	0	0	0	115	57	172	461	
7:45	73	0	51	124	47	143	0	190	0	0	0	0	0	115	73	188	502	
Hour Total	265	0	194	459	191	480	0	671	0	0	0	0	0	366	258	644	1774	
8:00am	52	0	52	104	55	130	0	185	0	0	0	0	0	85	76	161	450	
8:15	65	0	49	114	51	116	0	167	0	0	0	0	0	105	62	167	448	
8:30	72	0	40	112	47	110	0	157	0	0	0	0	0	110	57	167	436	
8:45	89	0	42	131	31	123	0	154	0	0	0	0	0	112	49	161	446	
Hour Total	278	0	183	461	184	479	0	663	0	0	0	0	0	412	244	656	1780	
Grand	543	0	377	920	375	959	0	1334	0	0	0	0	0	798	502	1300	3554	
% of Total	15.3%	0.0%	10.6%		10.6%	27.0%	0.0%		0.0%	0.0%	0.0%		0.0%	22.5%	14.1%			
Approch %				25.9%				37.5%									36.6%	
% of Approach	59.0%	0.0%	41.0%		28.1%	71.9%	0.0%		0.0%	0.0%	0.0%		0.0%	61.4%	38.6%			

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	SR 101 SB OFF RAMP	07:30am	.921	268	0	189	457	58.6	.0	41.3
Westbound	GRAVENSTEIN HWY (SR 116)		.942	201	515	0	716	28.0	71.9	.0
Northbound	SR 101 SB ON RAMP		.0	0	0	0	0	0.0	0.0	0.0
Eastbound			.915	0	420	268	688	.0	61.0	38.9

SR 101 SB OFF RAMP

189	0	268	0
			0
			0
			=====
			0
Inbound		457	
Outbound		0	
Total		457	

0

	0
704	515
	189

0

515

Inbound	688
Outbound	704
420	Total 1392

268

Inbound	716
Outbound	688
Total	1404

268
420
0
688

Inbound	0
Outbound	469
Total	469

201	0	0
0		
268		
=====		
469		

SR 101 SB ON RAMP

GRAVENSTEIN HWY (SR 116)

SR 101 SB OFF RAMP Southbound				GRAVENSTEIN HWY (SR 116) Westbound				SR 101 SB ON RAMP Northbound				Eastbound					
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	124	0	53	177	26	201	0	227	0	0	0	0	0	142	76	218	622
4:15	125	0	57	182	38	158	0	196	0	0	0	0	0	154	80	234	612
4:30	156	0	47	203	30	214	0	244	0	0	0	0	0	198	82	280	727
4:45	152	0	48	200	23	187	0	210	0	0	0	0	0	154	78	232	642
Hour Total	557	0	205	762	117	760	0	877	0	0	0	0	0	648	316	964	2603
5:00pm	157	0	43	200	24	189	0	213	0	0	0	0	0	160	68	228	641
5:15	152	0	44	196	22	177	0	199	0	0	0	0	0	175	57	232	627
5:30	172	0	34	206	34	155	0	189	0	0	0	0	0	179	75	254	649
5:45	166	0	47	213	31	160	0	191	0	0	0	0	0	108	60	168	572
Hour Total	647	0	168	815	111	681	0	792	0	0	0	0	0	622	260	882	2489
Grand	1204	0	373	1577	228	1441	0	1669	0	0	0	0	0	1270	576	1846	5092
% of Total	23.6%	0.0%	7.3%		4.5%	28.3%	0.0%		0.0%	0.0%	0.0%		0.0%	24.9%	11.3%		
Approch %			31.0%				32.8%									36.3%	
% of Approach	76.3%	0.0%	23.7%		13.7%	86.3%	0.0%		0.0%	0.0%	0.0%		0.0%	68.8%	31.2%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	SR 101 SB OFF RAMP	04:30pm	.984	617	0	182	799	77.2	.0	22.7
Westbound	GRAVENSTEIN HWY (SR 116)		.887	99	767	0	866	11.4	88.5	.0
Northbound	SR 101 SB ON RAMP		.0	0	0	0	0	0.0	0.0	0.0
Eastbound			.868	0	687	285	972	.0	70.6	29.3

SR 101 SB OFF RAMP

182	0	617	0
			0
			0
			0
			=====
			0
Inbound		799	
Outbound		0	
Total		799	

0

0
 949 767
 182
 =====
 0

767

Inbound 972
 Outbound 949
 687 Total 1921

Inbound 866
 Outbound 1304 99
 Total 2170

285

617
 687 1304
 0

Inbound 0
 Outbound 384
 Total 384
 99
 0
 285
 =====
 384
 SR 101 SB ON RAMP

GRAVENSTEIN HWY (SR 116)

0

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/20/05

File I.D. : 18

Page : 1

Southbound				GRAVENSTEIN HWY (SR 116) Westbound				SR 101 NB OFF RAMP Northbound				Eastbound					
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	0	0	0	0	0	123	0	123	34	0	13	47	0	131	0	131	301
7:15	0	0	0	0	0	118	0	118	32	0	12	44	0	139	0	139	301
7:30	0	0	0	0	0	122	0	122	52	0	10	62	0	193	0	193	377
7:45	0	0	0	0	0	135	0	135	55	0	13	68	0	188	0	188	391
Hour Total	0	0	0	0	0	498	0	498	173	0	48	221	0	651	0	651	1370
8:00am	0	0	0	0	0	127	0	127	58	0	14	72	0	137	0	137	336
8:15	0	0	0	0	0	113	0	113	54	0	17	71	0	170	0	170	354
8:30	0	0	0	0	0	107	0	107	50	0	21	71	0	182	0	182	360
8:45	0	0	0	0	0	98	0	98	56	0	18	74	0	201	0	201	373
Hour Total	0	0	0	0	0	445	0	445	218	0	70	288	0	690	0	690	1423
Grand	0	0	0	0	0	943	0	943	391	0	118	509	0	1341	0	1341	2793
% of Total	0.0%	0.0%	0.0%		0.0%	33.8%	0.0%		14.0%	0.0%	4.2%		0.0%	48.0%	0.0%		
Approch %								33.8%				18.2%				48.0%	
% of Approach	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%		76.8%	0.0%	23.2%		0.0%	100.0%	0.0%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/20/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound		07:30am	.0	0	0	0	0	0.0	0.0	0.0
Westbound	GRAVENSTEIN HWY (SR 116)		.920	0	497	0	497	.0	100.0	.0
Northbound	SR 101 NB OFF RAMP		.948	219	0	54	273	80.2	.0	19.7
Eastbound			.891	0	688	0	688	.0	100.0	.0

0	0	0	0
			0
			0
			0
			=====
			0
	Inbound		0
	Outbound		0
	Total		0

	219
716	497
	.0
=====	
	0

497

	Inbound	688
	Outbound	716
688	Total	1404

	Inbound	497
	Outbound	742
	Total	1239

0

0
688
54

	Inbound	273
	Outbound	0
	Total	273

GRAVENSTEIN HWY (SR 116)

0	219	0
0		
0		
=====		
0		
SR 101 NB OFF RAMP		

54

		GRAVENSTEIN HWY (SR 116)				SR 101 NB OFF RAMP													
		Southbound				Westbound				Northbound				Eastbound					
Start																			
Time		Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	
4:00pm		0	0	0	0	0	137	0	137	90	0	42	132	0	266	0	266	535	
4:15		0	0	0	0	0	114	0	114	82	0	41	123	0	279	0	279	516	
4:30		0	0	0	0	0	153	0	153	91	0	49	140	0	354	0	354	647	
4:45		0	0	0	0	0	133	0	133	77	0	57	134	0	305	0	305	572	
Hour Total		0	0	0	0	0	537	0	537	340	0	189	529	0	1204	0	1204	2270	
5:00pm		0	0	0	0	0	137	0	137	76	0	50	126	0	317	0	317	580	
5:15		0	0	0	0	0	122	0	122	77	0	43	120	0	327	0	327	569	
5:30		0	0	0	0	0	136	0	136	53	0	36	89	0	351	0	351	576	
5:45		0	0	0	0	0	118	0	118	73	0	40	113	0	274	0	274	505	
Hour Total		0	0	0	0	0	513	0	513	279	0	169	448	0	1269	0	1269	2230	
Grand		0	0	0	0	0	1050	0	1050	619	0	358	977	0	2473	0	2473	4500	
% of Total		0.0%	0.0%	0.0%		0.0%	23.3%	0.0%		13.8%	0.0%	8.0%		0.0%	55.0%	0.0%			
Apprch %									23.3%				21.7%					55.0%	
% of Apprch		0.0%	0.0%	0.0%		0.0%	100.0%	0.0%		63.4%	0.0%	36.6%		0.0%	100.0%	0.0%			

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/20/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound		04:30pm	.0	0	0	0	0	0.0	0.0	0.0
Westbound	GRAVENSTEIN HWY (SR 116)		.891	0	545	0	545	.0	100.0	.0
Northbound	SR 101 NB OFF RAMP		.929	321	0	199	520	61.7	.0	38.2
Eastbound			.920	0	1303	0	1303	.0	100.0	.0

Site Code : 00000000
Start Date: 07/20/05
File I.D. : 18
Page : 2

GRAVENSTEIN HWY (SR 116)

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 8

Page : 1

Start Time	REDWOOD DRIVE Southbound				COMMERCE BLVD. Westbound				Northbound				SHOPPING Eastbound				Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
7:00am	20	5	1	26	59	25	17	101	3	7	69	79	0	8	1	9	215
7:15	22	15	1	38	74	10	13	97	2	2	90	94	0	7	2	9	238
7:30	34	21	1	56	83	21	35	139	1	10	100	111	1	9	2	12	318
7:45	46	13	2	61	84	19	43	146	0	9	158	167	1	8	3	12	386
Hour Total	122	54	5	181	300	75	108	483	6	28	417	451	2	32	8	42	1157
8:00am	25	8	1	34	73	24	35	132	6	7	120	133	0	7	2	9	308
8:15	32	8	3	43	64	19	41	124	6	11	97	114	1	13	3	17	298
8:30	34	14	0	48	71	16	18	105	4	16	91	111	2	9	0	11	275
8:45	13	23	2	38	54	31	18	103	3	10	103	116	0	15	4	19	276
Hour Total	104	53	6	163	262	90	112	464	19	44	411	474	3	44	9	56	1157
Grand	226	107	11	344	562	165	220	947	25	72	828	925	5	76	17	98	2314
% of Total	9.8%	4.6%	.5%		24.3%	7.1%	9.5%		1.1%	3.1%	35.8%		.2%	3.3%	.7%		
Approch %				14.9%				40.9%				40.0%					4.2%
% of Approach	65.7%	31.1%	3.2%		59.3%	17.4%	23.2%		2.7%	7.8%	89.5%		5.1%	77.6%	17.3%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	07:30am	.795	137	50	7	194	70.6	25.7	3.6
Westbound	COMMERCE BLVD.		.926	304	83	154	541	56.1	15.3	28.4
Northbound			.786	13	37	475	525	2.4	7.0	90.4
Eastbound	SHOPPING		.735	3	37	10	50	6.0	74.0	20.0

[illegible]

	REDWOOD DRIVE				COMMERCE BLVD.								SHOPPING				
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Rght	Total	Left	Thru	Rght	Total	Left	Thru	Rght	Total	Left	Thru	Rght	Total	Total
4:00pm	46	45	2	93	59	47	39	145	10	26	183	219	3	34	9	46	503
4:15	70	29	1	100	59	37	45	141	4	28	148	180	2	29	7	38	459
4:30	56	34	3	93	55	59	62	176	15	32	164	211	3	46	7	56	536
4:45	64	32	0	96	63	47	36	146	8	27	173	208	0	35	8	43	493
Hour Total	236	140	6	382	236	190	182	608	37	113	668	818	8	144	31	183	1991
5:00pm	74	31	0	105	57	64	61	182	16	36	163	215	1	39	9	49	551
5:15	71	44	1	116	68	60	65	193	7	28	132	167	0	29	12	41	517
5:30	50	38	2	90	72	44	66	182	10	27	170	207	2	32	6	40	519
5:45	66	36	0	102	71	67	52	190	7	30	153	190	1	27	9	37	519
Hour Total	261	149	3	413	268	235	244	747	40	121	618	779	4	127	36	167	2106
Grand	497	289	9	795	504	425	426	1355	77	234	1286	1597	12	271	67	350	4097
% of Total	12.1%	7.1%	.2%		12.3%	10.4%	10.4%		1.9%	5.7%	31.4%		.3%	6.6%	1.6%		
Apprch %				19.4%				33.1%				39.0%				8.5%	
% of Apprch	62.5%	36.4%	1.1%		37.2%	31.4%	31.4%		4.8%	14.7%	80.5%		3.4%	77.4%	19.1%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Rght	Total	Left	Thru	Rght
Southbound	REDWOOD DRIVE	05:00pm	.890	261	149	3	413	63.1	36.0	.7
Westbound	COMMERCE BLVD.		.968	268	235	244	747	35.8	31.4	32.6
Northbound			.906	40	121	618	779	5.1	15.5	79.3
Eastbound	SHOPPING		.852	4	127	36	167	2.3	76.0	21.5

	REDWOOD DRIVE			
	3	149	261	4
				121
				244
				=====
				369
	Inbound		413	
	Outbound		369	
	Total		782	
SHOPPING				244
	40			
278	235			
	3			

	4			235
		Inbound	167	
		Outbound	278	
127	Total	445		

	36			
		Inbound	779	
		Outbound	453	
		Total	1232	
	268	40	121	618
	149			
	36			
	=====			
	453			
				261
				127
				1006
				618
				COMMERCE BLVD.

11

CITY OF ROHNERT PARK

All Traffic Data
 5098 Foothills Blvd. 3-302
 Roseville, CA. 95678
 (916) 771-8700

Site Code : 00000000
 Start Date: 08/24/05
 File I.D. : R22
 Page : 1

	ROBERTS LAKE ROAD				GOLF COURSE DRIVE															
	Southbound				Westbound				Northbound				Eastbound							
Start																				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total			
7:00am	2	0	13	15	0	149	5	154	0	0	0	0	8	26	0	34	203			
7:15	3	0	11	14	0	152	8	160	0	0	0	0	10	28	0	38	212			
7:30	5	0	13	18	0	223	18	241	0	0	0	0	13	55	0	68	327			
7:45	9	0	21	30	0	243	23	266	0	0	0	0	17	62	0	79	375			
Hour Total	19	0	58	77	0	767	54	821	0	0	0	0	40	171	0	219	1117			
8:00am	9	0	17	26	0	179	3	182	0	0	0	0	21	65	0	66	294			
8:15	8	0	20	28	0	151	10	161	0	0	0	0	16	84	0	100	269			
8:30	5	0	9	14	0	133	10	143	0	0	0	0	24	74	0	98	255			
8:45	4	0	11	15	0	127	7	134	0	0	0	0	20	70	0	90	239			
Hour Total	26	0	57	83	0	590	30	620	0	0	0	0	81	293	0	374	1077			
Grand	45	0	115	160	0	1357	84	1441	0	0	0	0	129	464	0	593	2194			
% of Total	2.1%	0.0%	5.2%		0.0%	61.9%	5.8%		0.0%	0.0%	0.0%		5.9%	21.1%	0.0%					
Approch %				7.3%				65.7%									27.0%			
% of Approch	28.1%	0.0%	71.9%		0.0%	94.2%	5.8%		0.0%	0.0%	0.0%		21.8%	78.2%	0.0%					

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 08/24/05

		Start	Peak Hr	Volumes				Percentages			
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right	
Southbound	ROBERTS LAKE ROAD	07:30am	.850	31	0	71	0	102	30.3	.0	69.6 .0
Westbound	GOLF COURSE DRIVE		.799	0	796	54	0	850	.0	93.6	6.3 .0
Northbound			.0	0	0	0	0	0	0.0	0.0	0.0 0.0
Eastbound			.832	67	266	0	0	333	20.1	79.0	.0 .0

CITY OF ROHNERT PARK

All Traffic Data
 5098 Foothills Blvd. 3-302
 Roseville, CA. 95678
 (916) 771-8700

Site Code : 00000000
 Start Date: 08/24/05
 File I.D. : R22
 Page : 2

ROBERTS LAKE ROAD

71	0	31	67
			0
			54
			=====
			121
	Inbound	102	
	Outbound	121	
	Total	223	

54

0
867 796
71
=====
67

796

Inbound	333
Outbound	867
266 Total	1200

Inbound	850
Outbound	297 0
Total	1147

0

31
266 297
0

Inbound	0
Outbound	0
Total	0

0	0	0
0		
0		
=====		
0		

GOLF COURSE DRIVE

All Traffic Data

5098 Foothills Blvd. 3-302

Roseville, CA. 95678

(916) 771-8700

Site Code : 00000000

Start Date: 08/24/05

File I.D. : R22

Page : 1

CITY OF ROHNERT PARK

ROBERTS LAKE ROAD

GOLF COURSE DRIVE

Southbound

Westbound

Northbound

Eastbound

Start

Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	15	0	42	61	0	95	15	110	0	0	0	0	36	191	0	227	398
4:15	24	0	48	72	0	117	19	136	0	0	0	0	33	203	0	236	444
4:30	22	0	53	75	0	122	15	137	0	0	0	0	55	191	0	246	450
4:45	36	0	48	84	0	129	10	139	0	0	0	0	41	203	0	244	467
Hour Total	101	0	191	292	0	463	59	522	0	0	0	0	165	786	0	953	1767

5:00pm	21	0	29	50	0	124	10	134	0	0	0	0	53	245	0	298	482
5:15	37	0	42	79	0	108	12	120	0	0	0	0	40	247	0	287	486
5:30	23	0	47	70	0	109	11	120	0	0	0	0	29	218	0	247	437
5:45	24	0	42	66	0	102	10	112	0	0	0	0	24	197	0	221	399
Hour Total	105	0	160	265	0	443	43	486	0	0	0	0	146	907	0	1053	1804

Grand	206	0	351	557	0	906	102	1008	0	0	0	0	311	1695	0	2006	3571
-------	-----	---	-----	-----	---	-----	-----	------	---	---	---	---	-----	------	---	------	------

% of Total	5.8%	0.0%	9.8%		0.0%	25.4%	2.9%		0.0%	0.0%	0.0%		8.7%	47.5%	0.0%		
------------	------	------	------	--	------	-------	------	--	------	------	------	--	------	-------	------	--	--

Approach %			15.6%				28.2%									56.2%	
------------	--	--	-------	--	--	--	-------	--	--	--	--	--	--	--	--	-------	--

% of Approach	37.0%	0.0%	63.0%		0.0%	89.9%	10.1%		0.0%	0.0%	0.0%		15.5%	84.5%	0.0%		
---------------	-------	------	-------	--	------	-------	-------	--	------	------	------	--	-------	-------	------	--	--

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 08/24/05

Direction	Street Name	Start	Peak Hr	Factor	Left	Thru	Right	Total	Left	Thru	Right	Percentage
Southbound	ROBERTS LAKE ROAD	04:30pm	.857		116	0	172	0	286	40.2	.0	59.7
Westbound	GOLF COURSE DRIVE		.953		0	483	47	0	530	.0	91.1	8.8
Northbound			.6		0	0	0	0	0	0.0	0.0	0.0
Eastbound			.902		169	886	0	0	1075	17.5	82.4	.0

CITY OF ROHNERT PARK

All Traffic Data
 5092 Foothills Blvd. 3-302
 Roseville, CA. 95678
 (916) 771-8700

Site Code : 00000000
 Start Date: 08/24/05
 File I.D. : R22
 Page : 2

ROBERTS LAKE ROAD

172	0	116	189
			0
			47
			=====
			236
Inbound		288	
Outbound		236	
Total		524	

47

0
655 483
172
=====
189

483

Inbound	1075
Outbound	655
886 Total	1730

Inbound	530
Outbound	1002 0
Total	1532

0

116
886 1002
0

Inbound	0
Outbound	0
Total	0

0	0	0
0		
0		
0		
=====		
0		

GOLF COURSE DRIVE

REDWOOD DRIVE					BUSINESS PARK DRIVE												
Southbound					Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	0	29	36	65	0	0	0	0	3	17	0	20	3	0	0	3	88
7:15	0	31	39	70	0	0	0	0	2	20	0	22	13	0	2	15	107
7:30	0	59	25	84	0	0	0	0	3	21	0	24	4	0	2	6	114
7:45	0	49	53	102	0	0	0	0	3	30	0	33	11	0	2	13	148
Hour Total	0	168	153	321	0	0	0	0	11	88	0	99	31	0	6	37	457
8:00am	0	48	49	97	0	0	0	0	5	26	0	31	13	0	4	17	146
8:15	0	36	29	65	0	0	0	0	3	28	0	31	3	0	3	6	102
8:30	0	54	17	71	0	0	0	0	3	36	0	39	13	0	1	14	124
8:45	0	46	15	61	0	0	0	0	1	51	0	52	11	0	3	14	127
Hour Total	0	184	110	294	0	0	0	0	12	141	0	153	40	0	11	51	498
Grand	0	352	263	615	0	0	0	0	23	229	0	252	71	0	17	88	955
% of Total	0.0%	36.9%	27.5%		0.0%	0.0%	0.0%		2.4%	24.0%	0.0%		7.4%	0.0%	1.8%		
Approch %				64.4%								26.4%					9.2%
% of Approch	0.0%	57.2%	42.8%		0.0%	0.0%	0.0%		9.1%	90.9%	0.0%		80.7%	0.0%	19.3%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	07:45am	.821	0	187	148	335	.0	55.8	44.1
Westbound			.0	0	0	0	0	0.0	0.0	0.0
Northbound			.859	14	120	0	134	10.4	89.5	.0
Eastbound	BUSINESS PARK DRIVE		.735	40	0	10	50	80.0	.0	20.0

Site Code : 00000000
Start Date: 07/19/05
File I.D. : 17
Page : 2

Inbound	0		
Outbound	0	0	
Total	0		

	0		
	0		0
	0		

0

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 17

Page : 1

REDWOOD DRIVE					BUSINESS PARK DRIVE												
Southbound					Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	0	99	11	110	0	0	0	0	4	101	0	105	36	0	13	49	264
4:15	0	115	11	126	0	0	0	0	6	102	0	108	30	0	6	36	270
4:30	0	143	11	154	0	0	0	0	3	110	0	113	42	0	10	52	319
4:45	0	135	15	150	0	0	0	0	3	116	0	119	23	0	3	26	295
Hour Total	0	492	48	540	0	0	0	0	16	429	0	445	131	0	32	163	1148
5:00pm	0	103	4	107	0	0	0	0	2	124	0	126	43	0	3	46	279
5:15	0	123	13	136	0	0	0	0	2	85	0	87	21	0	2	23	246
5:30	0	107	10	117	0	0	0	0	3	99	0	102	27	0	4	31	250
5:45	0	115	8	123	0	0	0	0	0	101	0	101	15	0	3	18	242
Hour Total	0	448	35	483	0	0	0	0	7	409	0	416	106	0	12	118	1017
Grand	0	940	83	1023	0	0	0	0	23	838	0	861	237	0	44	281	2165
% of Total	0.0%	43.4%	3.8%		0.0%	0.0%	0.0%		1.1%	38.7%	0.0%		10.9%	0.0%	2.0%		
Approch %			47.3%									39.8%				13.0%	
% of Approach	0.0%	91.9%	8.1%		0.0%	0.0%	0.0%		2.7%	97.3%	0.0%		84.3%	0.0%	15.7%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	04:15pm	.872	0	496	41	537	.0	92.3	7.6
Westbound			.0	0	0	0	0	0.0	0.0	0.0
Northbound			.925	14	452	0	466	3.0	96.9	.0
Eastbound	BUSINESS PARK DRIVE		.769	138	0	22	160	86.2	.0	13.7

Inbound	0	
Outbound	0	0
Total	0	

	0	
	0	0
	0	

0

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File J.D. : 7

Page : 1

	REDWOOD DRIVE				SR 101 SB RAMPS				WILFRED AVENUE								
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	52	22	1	75	43	3	77	123	1	17	5	23	0	1	5	6	227
7:15	63	42	4	109	38	0	100	138	2	29	2	33	3	0	2	5	285
7:30	73	53	2	128	46	0	123	169	2	26	1	29	0	5	0	5	331
7:45	59	49	6	114	59	3	163	225	0	41	3	44	4	1	5	10	393
Hour Total	247	166	13	426	186	6	463	655	5	113	11	129	7	7	12	26	1236
8:00am	57	38	1	96	50	0	120	170	0	32	3	35	1	3	2	6	307
8:15	61	42	2	105	32	1	111	144	1	36	4	43	2	1	4	7	299
8:30	64	49	4	117	21	1	99	121	1	43	8	52	1	1	1	3	293
8:45	54	39	3	96	34	1	115	150	1	50	4	55	0	2	0	2	303
Hour Total	236	168	10	414	137	3	445	585	3	163	19	185	4	7	7	18	1202
Grand	483	334	23	840	323	9	908	1240	8	276	30	314	11	14	19	44	2438
% of Total	19.8%	13.7%	.9%		13.2%	.4%	37.2%		.3%	11.3%	1.2%		.5%	.6%	.8%		
Approch %				34.5%				50.9%				12.9%					1.8%
% of Approach	57.5%	39.8%	2.7%		26.0%	.7%	73.2%		2.5%	87.9%	9.6%		25.0%	31.8%	43.2%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	07:30am	.865	250	182	11	443	56.4	41.0	2.4
Westbound	SR 101 SB RAMPS		.787	187	4	517	708	26.4	.5	73.0
Northbound			.858	3	137	11	151	1.9	90.7	7.2
Eastbound	WILFRED AVENUE		.700	7	10	11	28	25.0	35.7	39.2

[illegible]

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 7

Page : 1

	REDWOOD DRIVE				SR 101 SB RAMPS				WILFRED AVENUE								
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	48	101	6	155	53	2	144	199	14	120	6	140	2	1	6	9	503
4:15	53	74	11	138	60	5	119	184	4	143	9	156	1	3	3	7	485
4:30	56	93	9	158	71	1	160	232	8	158	15	181	1	3	3	7	578
4:45	33	61	5	99	65	3	116	184	4	88	10	102	1	0	8	9	394
Hour Total	190	329	31	550	249	11	539	799	30	509	40	579	5	7	20	32	1960
5:00pm	65	76	9	150	44	2	131	177	10	147	12	169	2	4	5	11	507
5:15	54	108	8	170	53	1	142	196	6	122	15	143	1	1	2	4	513
5:30	58	97	5	160	43	1	140	184	9	137	18	164	1	1	4	6	514
5:45	44	83	13	140	47	5	157	209	10	109	14	133	0	3	2	5	487
Hour Total	221	364	35	620	187	9	570	766	35	515	59	609	4	9	13	26	2021
Grand	411	693	66	1170	436	20	1109	1565	65	1024	99	1188	9	16	33	58	3981
% of Total	10.3%	17.4%	1.7%		11.0%	.5%	27.9%		1.6%	25.7%	2.5%		.2%	.4%	.8%		
Approch %				29.4%				39.3%				29.8%				1.5%	
% of Approach	35.1%	59.2%	5.6%		27.9%	1.3%	70.9%		5.5%	86.2%	8.3%		15.5%	27.6%	56.9%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	REDWOOD DRIVE	05:00pm	.912	221	364	35	620	35.6	58.7	5.6
Westbound	SR 101 SB RAMPS		.916	187	9	570	766	24.4	1.1	74.4
Northbound			.901	35	515	59	609	5.7	84.5	9.6
Eastbound	WILFRED AVENUE		.591	4	9	13	26	15.3	34.6	50.0

				REDWOOD DRIVE					
				35	364	221		4	
								515	
								570	
								=====	
								1089	
					Inbound	620			
					Outbound	1089			
					Total	1709			
									570
									9
					Inbound	26			
					Outbound	79			
					9	Total	105		
									221
									9
									289
									59
									SR 101 SB RAMPS
					Inbound	609			
					Outbound	564			
					Total	1173			
					187	35	515		59
					364				
					13				
					=====				
					564				

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 21

Page : 1

STONY POINT ROAD					GRAVENSTEIN HWY (SR 116)											
Southbound					Westbound				Northbound				Eastbound			
Start																
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
7:00am	4	66	3	73	37	53	9	99	11	29	19	59	21	68	54	143
7:15	9	60	14	83	26	63	10	99	16	45	18	79	24	75	69	168
7:30	13	83	14	110	22	38	14	74	16	54	22	92	19	81	77	177
7:45	15	53	11	79	49	77	20	146	26	51	23	100	31	117	66	214
Hour Total	38	262	42	342	134	231	53	418	69	179	82	330	95	341	266	702
8:00am	12	69	16	97	37	63	7	107	33	42	17	92	32	82	53	177
8:15	21	60	12	93	28	69	5	102	22	53	20	95	23	93	79	195
8:30	11	69	11	91	42	74	12	128	35	46	23	104	28	97	68	193
8:45	15	61	10	86	34	69	11	114	36	39	21	96	32	101	59	192
Hour Total	59	259	49	367	141	275	35	451	126	180	81	387	115	373	269	757
Grand	97	521	91	709	275	506	88	869	195	359	163	717	210	714	535	1459
% of Total	2.6%	13.9%	2.4%		7.3%	13.5%	2.3%		5.2%	9.6%	4.3%		5.6%	19.0%	14.3%	
Approch %	18.9%				23.1%				19.1%				38.9%			
% of Approach	13.7%	73.5%	12.8%		31.6%	58.2%	10.1%		27.2%	50.1%	22.7%		14.4%	48.9%	36.7%	

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	STONY POINT ROAD	07:45am	.920	56	251	50	357	15.6	70.3	14.0
Westbound	GRAVENSTEIN HWY (SR 116)		.827	156	283	44	483	32.2	58.5	9.1
Northbound			.940	116	192	83	391	29.6	49.1	21.2
Eastbound			.910	114	389	276	779	14.6	49.9	35.4

STONY	POINT	ROAD	
50	251	56	114
			192
			44
			=====
			350
	Inbound	357	
	Outbound	350	
	Total	707	

	116
449	283
	50

114

	Inbound	779
	Outbound	449
389	Total	1228

276

	Inbound	391
	Outbound	683
	Total	1074
156		116
251		192
276		
=====		
683		

GRAVENSTEIN HWY (SR 116)

83

44

283

Inbound	483
Outbound	528
Total	1011

56
389
83
528

	STONY POINT ROAD				GRAVENSTEIN HWY (SR 116)																	
	Southbound				Westbound				Northbound				Eastbound									
Start																						
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total					
4:00pm	21	77	52	150	21	124	28	173	79	135	32	246	36	94	31	161	730					
4:15	25	74	41	140	17	118	31	166	88	132	29	249	39	89	27	155	710					
4:30	18	83	55	156	20	131	18	169	67	125	30	222	28	117	39	184	731					
4:45	19	78	49	146	32	119	13	164	88	120	38	246	20	73	49	142	698					
Hour Total	83	312	197	592	90	492	90	672	322	512	129	963	123	373	146	642	2869					
5:00pm	22	83	53	158	26	134	29	189	67	107	13	187	27	107	39	173	707					
5:15	28	94	52	174	32	125	26	183	94	133	20	247	40	82	36	158	762					
5:30	14	71	47	132	25	132	25	182	70	149	30	249	26	111	48	185	748					
5:45	24	61	24	109	21	108	22	151	105	98	25	228	12	93	43	148	636					
Hour Total	88	309	176	573	104	499	102	705	336	487	88	911	105	393	166	664	2853					
Grand	171	621	373	1165	194	991	192	1377	658	999	217	1874	228	766	312	1306	5722					
% of Total	3.0%	10.9%	6.5%		3.4%	17.3%	3.4%		11.5%	17.5%	3.8%		4.0%	13.4%	5.5%							
Approch %				20.4%				24.1%				32.8%				22.8%						
% of Appren	14.7%	53.3%	32.0%		14.1%	72.0%	13.9%		35.1%	53.3%	11.6%		17.5%	58.7%	23.9%							

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	STONY POINT ROAD	04:45pm	.876	83	326	201	610	13.6	53.4	32.9
Westbound	GRAVENSTEIN HWY (SR 116)		.950	115	510	93	718	16.0	71.0	12.9
Northbound			.933	319	509	101	929	34.3	54.7	10.8
Eastbound			.889	113	373	172	658	17.1	56.6	26.1

STONY POINT ROAD

201	326	83	113
			509
			93
			=====
			715
	Inbound	610	
	Outbound	715	
	Total	1325	

	319
1030	510
	201
=====	
	113

93

510

	Inbound	658
	Outbound	1030
373	Total	1688

	Inbound	718
	Outbound	557
	Total	1275

172

83
373
101
557

	Inbound	929
	Outbound	613
	Total	1542

GRAVENSTEIN HWY (SR 116)

115	319	509
326		
172		
=====		
613		

101

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 5

Page : 1

LABATH AVENUE				WILFRED AVENUE				Northbound				Eastbound					
Southbound				Westbound													
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	0	0	0	0	0	5	0	5	1	1	0	2	2	4	0	6	13
7:15	1	0	0	1	2	4	0	6	0	0	1	1	0	3	0	3	11
7:30	0	0	0	0	0	5	0	5	0	0	0	0	0	4	1	5	10
7:45	2	0	0	2	0	5	0	5	0	0	0	0	0	6	0	6	13
Hour Total	3	0	0	3	2	19	0	21	1	1	1	3	2	17	1	20	47
8:00am	0	0	1	1	0	1	1	2	0	0	0	0	0	4	0	4	7
8:15	1	0	0	1	0	4	0	4	0	0	1	1	0	4	0	4	10
8:30	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	6
8:45	1	0	0	1	0	8	0	8	0	0	0	0	0	2	0	2	11
Hour Total	2	0	1	3	0	19	1	20	0	0	1	1	0	10	0	10	34
Grand	5	0	1	6	2	38	1	41	1	1	2	4	2	27	1	30	81
% of Total	6.2%	0.0%	1.2%		2.5%	46.9%	1.2%		1.2%	1.2%	2.5%		2.5%	33.3%	1.2%		
Approch %				7.4%				50.6%				4.9%				37.0%	
% of Approach	83.3%	0.0%	16.7%		4.9%	92.7%	2.4%		25.0%	25.0%	50.0%		6.7%	90.0%	3.3%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	LABATH AVENUE	07:00am	.375	3	0	0	3	100.0	.0	.0
Westbound	WILFRED AVENUE		.875	2	19	0	21	9.5	90.4	.0
Northbound			.375	1	1	1	3	33.3	33.3	33.3
Eastbound			.833	2	17	1	20	10.0	85.0	5.0

LABATH AVENUE

0	0	3	2
			1
			0
			=====
			3
	Inbound	3	
	Outbound	3	
	Total	6	

0

19

	1
20	19
	0
=====	
	2

Inbound	20
Outbound	20
17 Total	40

1

Inbound	21
Outbound	21
Total	42

2

3	
17	21
1	

Inbound	3
Outbound	3
Total	6

1

1

2
0
1
=====
3

WILFRED AVENUE

1

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 5

Page : 1

LABATH AVENUE					WILFRED AVENUE												
Southbound					Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	0	0	0	0	0	19	0	19	0	0	0	0	0	6	0	6	25
4:15	1	0	0	1	1	17	2	20	0	0	0	0	0	4	0	4	25
4:30	1	0	0	1	2	16	0	18	0	0	1	1	0	4	0	4	24
4:45	2	1	0	3	0	10	1	11	0	0	0	0	0	2	0	2	16
Hour Total	4	1	0	5	3	62	3	68	0	0	1	1	0	16	0	16	90
5:00pm	0	1	0	1	0	18	1	19	0	0	1	1	0	4	0	4	25
5:15	3	0	0	3	0	15	1	16	0	0	0	0	0	0	0	0	19
5:30	1	0	0	1	0	16	0	16	1	0	0	1	0	3	0	3	21
5:45	2	0	0	2	0	22	2	24	0	0	1	1	0	1	0	1	28
Hour Total	6	1	0	7	0	71	4	75	1	0	2	3	0	8	0	8	93
Grand	10	2	0	12	3	133	7	143	1	0	3	4	0	24	0	24	183
% of Total	5.5%	1.1%	0.0%		1.6%	72.7%	3.8%		.5%	0.0%	1.6%		0.0%	13.1%	0.0%		
Approch %				6.6%				78.1%				2.2%					13.1%
% of Approch	83.3%	16.7%	0.0%		2.1%	93.0%	4.9%		25.0%	0.0%	75.0%		0.0%	100.0%	0.0%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	LABATH AVENUE	05:00pm	.583	6	1	0	7	85.7	14.2	.0
Westbound	WILFRED AVENUE		.781	0	71	4	75	.0	94.6	5.3
Northbound			.750	1	0	2	3	33.3	.0	66.6
Eastbound			.500	0	8	0	8	.0	100.0	.0

LABATH AVENUE

0	1	6	0
			0
			4
			=====
			4
	Inbound	7	
	Outbound	4	
	Total	11	

4

	1
72	71
	0
=====	
	0

71

	Inbound	8
	Outbound	72
8	Total	80

	Inbound	75
	Outbound	16
	Total	91

6
8
2
16

	Inbound	3
	Outbound	1
	Total	4

0	1	0
1		
0		
=====		
1		

WILFRED AVENUE

2

	DOWDELL AVENUE				WILFRED AVENUE													
	Southbound				Westbound				Northbound				Eastbound					
Start																		
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total	
7:00am	4	0	0	4	0	5	0	5	0	0	0	0	0	3	0	3	12	
7:15	0	0	2	2	0	4	1	5	0	0	0	0	1	5	0	6	13	
7:30	1	0	0	1	0	5	0	5	0	0	0	0	0	4	0	4	10	
7:45	2	1	0	3	2	5	2	9	0	0	0	0	0	8	0	8	20	
Hour Total	7	1	2	10	2	19	3	24	0	0	0	0	1	20	0	21	55	
8:00am	3	1	1	5	0	1	0	1	0	1	0	1	1	3	0	4	11	
8:15	0	0	1	1	1	3	0	4	0	0	1	1	0	6	0	6	12	
8:30	2	0	0	2	0	6	0	6	0	0	1	1	0	0	0	0	9	
8:45	0	0	2	2	0	5	0	5	0	0	0	0	0	3	0	3	10	
Hour Total	5	1	4	10	1	15	0	16	0	1	2	3	1	12	0	13	42	
Grand	12	2	6	20	3	34	3	40	0	1	2	3	2	32	0	34	97	
% of Total	12.4%	2.1%	6.2%		3.1%	35.1%	3.1%		0.0%	1.0%	2.1%		2.1%	33.0%	0.0%			
Approch %				20.6%				41.2%				3.1%				35.1%		
% of Approch	60.0%	10.0%	30.0%		7.5%	85.0%	7.5%		0.0%	33.3%	66.7%		5.9%	94.1%	0.0%			

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	DOWDELL AVENUE	07:00am	.625	7	1	2	10	70.0	10.0	20.0
Westbound	WILFRED AVENUE		.667	2	19	3	24	8.3	79.1	12.5
Northbound			.0	0	0	0	0	0.0	0.0	0.0
Eastbound			.656	1	20	0	21	4.7	95.2	.0

DOWDELL AVENUE

2	1	7	1
			0
			3
			=====
			4
	Inbound	10	
	Outbound	4	
	Total	14	

3

21 0
 19
 2

1

19

Inbound	21
Outbound	21
Total	42

20

Inbound	24
Outbound	27
Total	51

2

0

7
 20
 0

27

Inbound	0
Outbound	3
Total	3

0

0

0

2
 1
 0
 =====
 3

WILFRED AVENUE

	DOWDELL AVENUE				WILFRED AVENUE															
	Southbound				Westbound				Northbound				Eastbound							
Start																				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total			
4:00pm	3	0	0	3	0	19	3	22	0	0	0	0	0	6	0	6	31			
4:15	1	2	2	5	0	18	2	20	1	1	2	4	1	4	0	5	34			
4:30	0	0	2	2	0	16	2	18	0	1	1	2	0	6	0	6	28			
4:45	5	0	0	5	0	11	1	12	0	0	0	0	0	4	0	4	21			
Hour Total	9	2	4	15	0	64	8	72	1	2	3	6	1	20	0	21	114			
5:00pm	5	0	2	7	0	17	4	21	0	1	2	3	0	4	1	5	36			
5:15	1	0	2	3	0	14	1	15	0	0	0	0	0	3	0	3	21			
5:30	2	0	2	4	0	14	1	15	0	0	0	0	0	4	0	4	23			
5:45	3	0	0	3	2	24	2	28	0	0	0	0	2	2	0	4	35			
Hour Total	11	0	6	17	2	69	8	79	0	1	2	3	2	13	1	16	115			
Grand	20	2	10	32	2	133	16	151	1	3	5	9	3	33	1	37	229			
% of Total	8.7%	.9%	4.4%		.9%	58.1%	7.0%		.4%	1.3%	2.2%		1.3%	14.4%	.4%					
Approch %			14.0%				65.9%				3.9%					16.2%				
% of Approach	62.5%	6.2%	31.2%		1.3%	88.1%	10.6%		11.1%	33.3%	55.6%		8.1%	89.2%	2.7%					

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	DOWDELL AVENUE	04:15pm	.679	11	2	6	19	57.8	10.5	31.5
Westbound	WILFRED AVENUE		.845	0	62	9	71	.0	87.3	12.6
Northbound			.562	1	3	5	9	11.1	33.3	55.5
Eastbound			.833	1	18	1	20	5.0	90.0	5.0

DOWDELL AVENUE

6	2	11	1
			3
			9
			=====
			13
	Inbound	19	
	Outbound	13	
	Total	32	

9

1
 69 62
 6

1

62

Inbound 20
 Outbound 69
 18 Total 89

1

Inbound 71
 Outbound 34 0
 Total 105

11
 18 34
 5

Inbound 9
 Outbound 3
 Total 12

0
 2
 1
 =====
 3

1 3

5

WILFRED AVENUE

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 10

Page : 1

	COMMERCE BLVD.				AUTO CENTER				SR 101 NB RAMPS								
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
7:00am	0	83	84	167	0	0	0	0	93	29	0	122	37	0	5	42	331
7:15	2	90	90	182	0	0	0	0	123	25	1	149	31	0	7	38	369
7:30	0	131	105	236	0	0	0	0	146	46	0	192	20	0	11	31	459
7:45	3	198	99	300	0	0	0	0	97	41	1	139	31	0	14	45	484
Hour Total	5	502	378	885	0	0	0	0	459	141	2	602	119	0	37	156	1643
8:00am	2	119	89	210	1	0	0	1	118	49	2	169	22	0	8	30	410
8:15	1	114	92	207	2	2	2	6	104	51	4	159	36	0	8	44	416
8:30	2	96	88	186	3	1	2	6	110	42	2	154	23	0	13	36	382
8:45	1	101	81	183	0	0	1	1	85	46	2	133	35	0	8	43	360
Hour Total	6	430	350	786	6	3	5	14	417	188	10	615	116	0	37	153	1568
Grand	11	932	728	1671	6	3	5	14	876	329	12	1217	235	0	74	309	3211
% of Total	.3%	29.0%	22.7%		.2%	.1%	.2%		27.3%	10.2%	.4%		7.3%	0.0%	2.3%		
Approch %				52.0%				.4%				37.9%					9.6%
% of Approach	.7%	55.8%	43.6%		42.9%	21.4%	35.7%		72.0%	27.0%	1.0%		76.1%	0.0%	23.9%		

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	COMMERCE BLVD.	07:30am	.794	6	562	385	953	.6	58.9	40.3
Westbound	AUTO CENTER		.292	3	2	2	7	42.8	28.5	28.5
Northbound			.858	465	187	7	659	70.5	28.3	1.0
Eastbound	SR 101 NB RAMPS		.833	109	0	41	150	72.6	.0	27.3

COMMERCE BLVD.

385	562	6	109
			187
			2
			=====
			298
	Inbound	953	
	Outbound	298	
	Total	1251	

SR 101 NB RAMPS

	465
852	2
	385

109

Inbound	150
Outbound	852
0	Total

41

Inbound	659
Outbound	606
Total	1265
3	465
562	187
41	
=====	
606	

7
6
0
7
13
AUTO CENTER

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 10

Page : 1

COMMERCE BLVD. Southbound				AUTO CENTER Westbound				Northbound				SR 101 NB RAMPS Eastbound					
Start	Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
	4:00pm	1	120	125	246	4	1	1	6	111	125	1	237	62	1	9	72
	4:15	3	118	119	240	4	1	2	7	98	131	2	231	68	1	8	77
	4:30	3	102	125	230	1	0	2	3	143	146	0	289	77	1	5	83
	4:45	0	102	101	203	1	1	0	2	112	134	0	246	68	0	7	75
Hour Total		7	442	470	919	10	3	5	18	464	536	3	1003	275	3	29	307
	5:00pm	1	107	123	231	2	1	1	4	148	137	0	285	82	1	9	92
	5:15	1	90	105	196	0	0	1	1	105	122	1	228	93	0	4	97
	5:30	1	104	124	229	1	0	0	1	127	130	0	257	78	0	8	86
	5:45	1	101	97	199	1	0	1	2	84	131	0	215	94	0	5	99
Hour Total		4	402	449	855	4	1	3	8	464	520	1	985	347	1	26	374
Grand		11	844	919	1774	14	4	8	26	928	1056	4	1988	622	4	55	681
% of Total		.2%	18.9%	20.6%		.3%	.1%	.2%		20.8%	23.6%	.1%		13.9%	.1%	1.2%	
Approch %				39.7%				.6%				44.5%				15.2%	
% of Approach		.6%	47.6%	51.8%		53.8%	15.4%	30.8%		46.7%	53.1%	.2%		91.3%	.6%	8.1%	

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	COMMERCE BLVD.	04:15pm	.942	7	429	468	904	.7	47.4	51.7
Westbound	AUTO CENTER		.571	8	3	5	16	50.0	18.7	31.2
Northbound			.909	501	548	2	1051	47.6	52.1	.1
Eastbound	SR 101 NB RAMPS		.889	295	3	29	327	90.2	.9	8.8

COMMERCE BLVD.

468	429	7	295
			548
			5
			=====
			848
	Inbound	904	
	Outbound	848	
	Total	1752	

SR 101 NB RAMPS

501
972 3
468
=====
295

5

3

Inbound	327
Outbound	972
3 Total	1299

Inbound	16
Outbound	12 8
Total	28

29

7

3

12

2

Inbound	1051
Outbound	466
Total	1517
8	501 548
429	
29	
=====	
466	

AUTO CENTER

2

CITY OF ROHNERT PARK

Site Code : 00000000

Start Date: 07/19/05

File I.D. : 9

Page : 1

COMMERCE BLVD.				GOLF COURSE DRIVE															
Southbound				Westbound				Northbound				Eastbound							
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total		
7:00am	19	78	0	97	89	0	65	154	0	36	30	66	0	0	0	0	317		
7:15	32	86	0	118	95	0	80	175	0	17	39	56	0	0	0	0	349		
7:30	40	105	0	145	131	0	106	237	0	32	34	66	0	0	0	0	448		
7:45	59	150	0	209	148	0	117	265	0	31	41	72	0	0	0	0	546		
Hour Total	150	419	0	569	463	0	368	831	0	116	144	260	0	0	0	0	1660		
8:00am	48	103	0	151	107	0	91	198	0	41	30	71	0	0	0	0	420		
8:15	44	97	0	141	112	0	83	195	0	43	43	86	0	0	0	0	422		
8:30	44	90	0	134	91	0	73	164	0	32	36	68	0	0	0	0	366		
8:45	41	90	0	131	93	0	66	159	0	37	45	82	0	0	0	0	372		
Hour Total	177	380	0	557	403	0	313	716	0	153	154	307	0	0	0	0	1580		
Grand	327	799	0	1126	866	0	681	1547	0	269	298	567	0	0	0	0	3240		
% of Total	10.1%	24.7%	0.0%		26.7%	0.0%	21.0%		0.0%	8.3%	9.2%		0.0%	0.0%	0.0%				
Approch %				34.8%				47.7%				17.5%							
% of Approch	29.0%	71.0%	0.0%		56.0%	0.0%	44.0%		0.0%	47.4%	52.6%		0.0%	0.0%	0.0%				

Peak Hour Analysis By Entire Intersection for the Period: 07:00am to 08:45am on 07/19/05

Direction	Street Name	Start	Peak Hr	..... Volumes .....				..... Percentages		
		Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	COMMERCE BLVD.	07:30am	.773	191	455	0	646	29.5	70.4	.0
Westbound	GOLF COURSE DRIVE		.844	498	0	397	895	55.6	.0	44.3
Northbound			.858	0	147	148	295	.0	49.8	50.1
Eastbound			.0	0	0	0	0	0.0	0.0	0.0

COMMERCE BLVD.

0	455	191	0
			147
			397
			=====
			544
	Inbound	646	
	Outbound	544	
	Total	1190	

397

0	0
0	0
	0

0

0

Inbound	0
Outbound	0
0 Total	0

0

Inbound	895	
Outbound	339	498
Total	1234	

191

0

339

148

Inbound	295
Outbound	953
Total	1248

498

0

147

148

455

0

=====

953

GOLF COURSE DRIVE

	COMMERCE BLVD.				GOLF COURSE DRIVE												
	Southbound				Westbound				Northbound				Eastbound				
Start																	
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00pm	110	156	0	266	90	0	77	167	0	72	116	188	0	0	0	0	621
4:15	103	144	0	247	96	0	72	168	0	75	128	203	0	0	0	0	618
4:30	125	141	0	266	91	0	78	169	0	98	129	227	0	0	0	0	662
4:45	145	128	0	273	73	0	99	172	0	48	154	202	0	0	0	0	647
Hour Total	483	569	0	1052	350	0	326	676	0	293	527	820	0	0	0	0	2548
5:00pm	147	130	0	277	100	0	103	203	0	80	143	223	0	0	0	0	703
5:15	122	111	0	233	84	0	117	201	0	76	145	221	0	0	0	0	655
5:30	139	115	0	254	114	0	114	228	0	70	140	210	0	0	0	0	692
5:45	139	107	0	246	92	0	113	205	0	83	143	226	0	0	0	0	677
Hour Total	547	463	0	1010	390	0	447	837	0	309	571	880	0	0	0	0	2727
Grand	1030	1032	0	2062	740	0	773	1513	0	602	1098	1700	0	0	0	0	5275
% of Total	19.5%	19.6%	0.0%		14.0%	0.0%	14.7%		0.0%	11.4%	20.8%		0.0%	0.0%	0.0%		
Approch %				39.1%				28.7%				32.2%					
% of Approach	50.0%	50.0%	0.0%		48.9%	0.0%	51.1%		0.0%	35.4%	64.6%		0.0%	0.0%	0.0%		

Peak Hour Analysis By Entire Intersection for the Period: 04:00pm to 05:45pm on 07/19/05

		Start	Peak Hr	..... Volumes .....				..... Percentages		
Direction	Street Name	Peak Hour	Factor	Left	Thru	Right	Total	Left	Thru	Right
Southbound	COMMERCE BLVD.	05:00pm	.912	547	463	0	1010	54.1	45.8	.0
Westbound	GOLF COURSE DRIVE		.918	390	0	447	837	46.5	.0	53.4
Northbound			.973	0	309	571	880	.0	35.1	64.8
Eastbound			.0	0	0	0	0	0.0	0.0	0.0

COMMERCE BLVD.

0	463	547	0
			309
			447
			=====
			756
	Inbound	1010	
	Outbound	756	
	Total	1766	

447

0	0
0	0
0	0

0

0

Inbound	0
Outbound	0
0 Total	0

Inbound	837
Outbound	1118 390
Total	1955

0

547

0

1118

571

GOLF COURSE DRIVE

Inbound	880
Outbound	853
Total	1733

390	0	309	571
-----	---	-----	-----

463

0

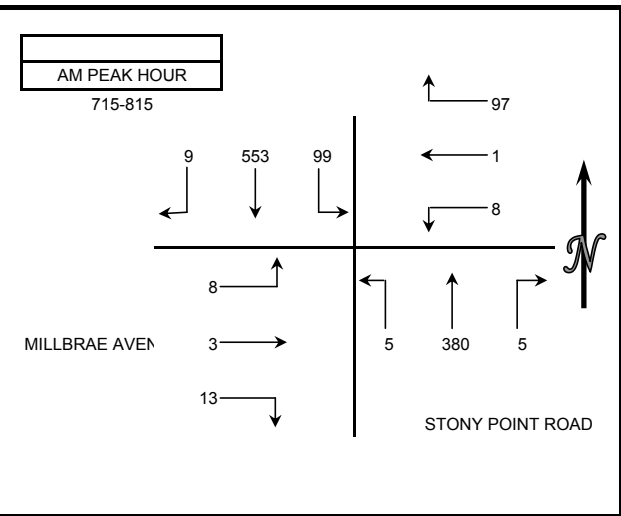
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853

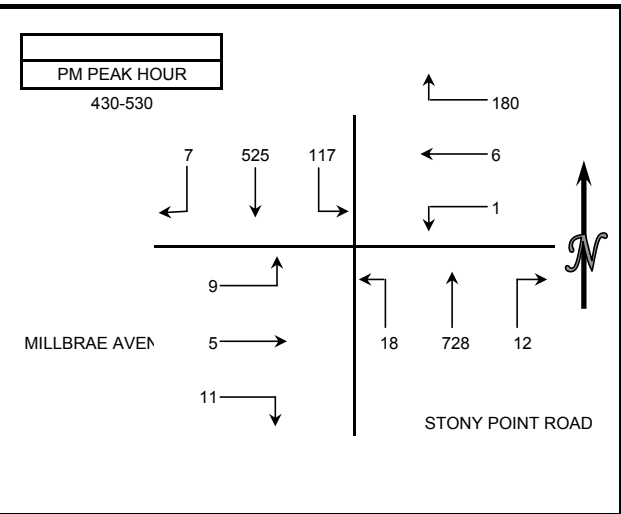
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN AND ASSOCIATES
 PROJECT: ROHNERT PARK
 DATE: WEDNESDAY, NOVEMBER 8TH 2006
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
 INTERSECTION: N/S STONY POINT ROAD
 E/W MILLBRAE AVENUE

15 MIN COUNTS													
7:00 AM TO 9:00 AM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	1	102	27	24	1	4	1	79	1	2	0	0	242
715-730	2	125	26	28	0	3	1	105	2	4	1	1	298
730-745	3	138	27	23	1	3	1	96	0	5	0	4	301
745-800	3	149	22	24	0	1	1	88	2	4	0	1	295
800-815	1	141	24	22	0	1	2	91	1	0	2	2	287
815-830	1	123	21	19	0	1	0	79	0	5	0	1	250
830-845	2	107	22	18	1	2	1	86	1	0	1	0	241
845-900	0	83	18	10	0	1	1	71	0	1	1	1	187
HOURLY TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	9	514	102	99	2	11	4	368	5	15	1	6	1136
715-815	9	553	99	97	1	8	5	380	5	13	3	8	1181
730-830	8	551	94	88	1	6	4	354	3	14	2	8	1133
745-845	7	520	89	83	1	5	4	344	4	9	3	4	1073
800-900	4	454	85	69	1	5	4	327	2	6	4	4	965



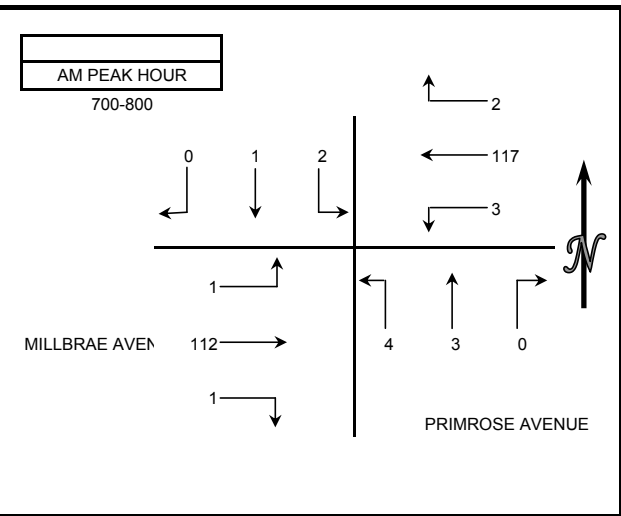
15 MIN COUNTS													
4:00 PM TO 6:00 PM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	2	118	20	31	0	2	3	182	7	3	0	0	368
415-430	2	110	21	37	1	1	4	176	3	1	0	1	357
430-445	2	121	31	43	1	0	2	188	4	3	2	3	400
445-500	4	135	30	48	3	0	2	186	6	4	1	1	420
500-515	0	138	30	43	2	0	3	177	3	1	1	2	400
515-530	1	131	26	46	0	1	5	177	5	3	1	3	399
530-545	1	123	28	38	0	1	1	183	4	0	1	1	381
545-600	3	114	26	38	2	2	5	163	5	1	1	0	360
HOURLY TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	10	484	102	159	5	3	11	732	20	11	3	5	1545
415-515	8	504	112	171	7	1	11	727	16	9	4	7	1577
430-530	7	525	117	180	6	1	12	728	18	11	5	9	1619
445-545	6	527	114	175	5	2	11	723	18	8	4	7	1600
500-600	5	506	110	165	4	4	14	700	17	5	4	6	1540



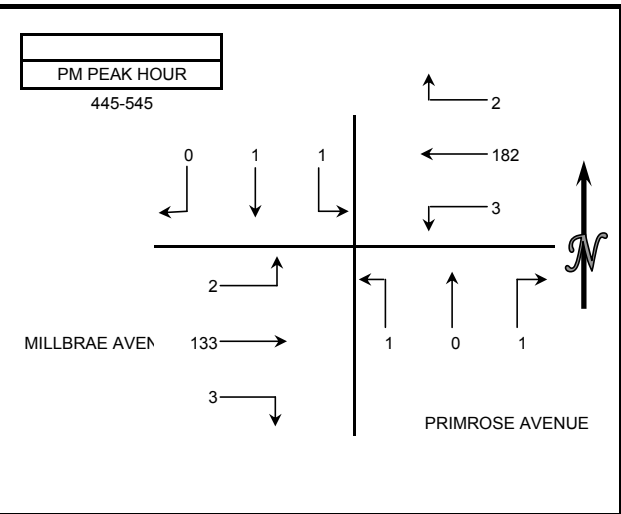
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN AND ASSOCIATES
 PROJECT: ROHNERT PARK
 DATE: WEDNESDAY, NOVEMBER 8TH 2006
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
 INTERSECTION: N/S PRIMROSE AVENUE
 E/W MILLBRAE AVENUE

15 MIN COUNTS													
7:00 AM TO 9:00 AM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	0	0	1	2	26	1	0	2	2	0	26	0	60
715-730	0	0	0	0	35	1	0	1	1	0	34	1	73
730-745	0	1	1	0	32	1	0	0	1	0	33	0	69
745-800	0	0	0	0	24	0	0	0	0	1	19	0	44
800-815	0	1	0	0	19	0	1	1	0	1	23	0	46
815-830	0	1	0	0	19	0	0	0	0	2	23	0	45
830-845	0	0	1	0	22	0	0	0	0	0	27	0	50
845-900	0	0	0	2	15	0	0	0	0	0	23	2	42
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	0	1	2	2	117	3	0	3	4	1	112	1	246
715-815	0	2	1	0	110	2	1	2	2	2	109	1	232
730-830	0	3	1	0	94	1	1	1	1	4	98	0	204
745-845	0	2	1	0	84	0	1	1	0	4	92	0	185
800-900	0	2	1	2	75	0	1	1	0	3	96	2	183



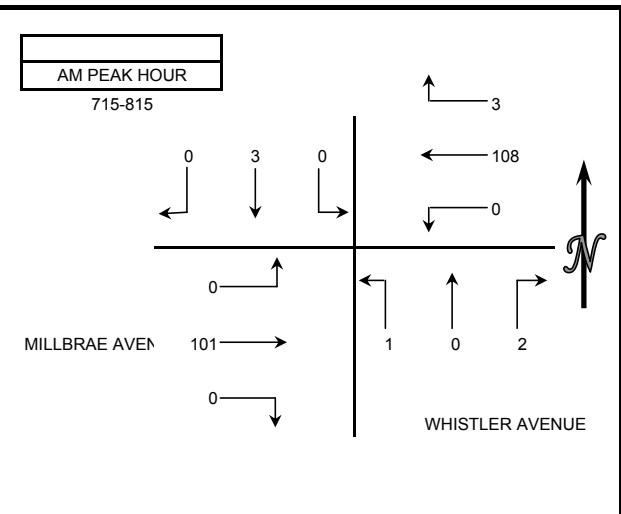
15 MIN COUNTS													
4:00 PM TO 6:00 PM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	0	0	0	0	34	0	0	1	0	1	24	0	60
415-430	0	0	0	0	47	0	0	0	1	0	30	0	78
430-445	0	0	0	1	46	0	2	0	0	3	31	1	84
445-500	0	0	0	1	47	2	0	0	1	0	36	1	88
500-515	0	0	0	0	48	1	0	0	0	2	25	0	76
515-530	0	1	1	0	45	0	0	0	0	1	32	0	80
530-545	0	0	0	1	42	0	1	0	0	0	40	1	85
545-600	1	0	1	0	33	0	0	0	3	0	27	0	65
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	0	0	0	2	174	2	2	1	2	4	121	2	310
415-515	0	0	0	2	188	3	2	0	2	5	122	2	326
430-530	0	1	1	2	186	3	2	0	1	6	124	2	328
445-545	0	1	1	2	182	3	1	0	1	3	133	2	329
500-600	1	1	2	1	168	1	1	0	3	3	124	1	306



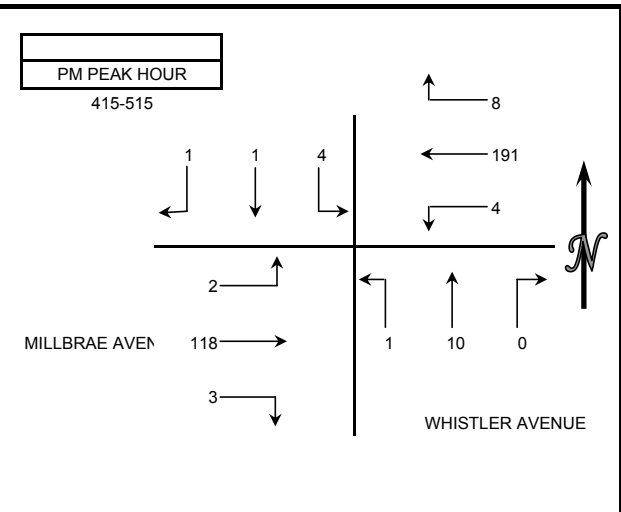
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN AND ASSOCIATES
 PROJECT: ROHNERT PARK
 DATE: WEDNESDAY, NOVEMBER 8TH 2006
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
 INTERSECTION: N/S WHISTLER AVENUE
 E/W MILLBRAE AVENUE

15 MIN COUNTS													
7:00 AM TO 9:00 AM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	0	0	0	0	19	0	0	1	1	0	17	0	38
715-730	0	1	0	0	34	0	1	0	0	0	27	0	63
730-745	0	1	0	0	27	0	0	0	0	0	33	0	61
745-800	0	0	0	0	24	0	0	0	1	0	21	0	46
800-815	0	1	0	3	23	0	1	0	0	0	20	0	48
815-830	0	0	0	0	20	1	0	0	0	0	24	1	46
830-845	0	0	1	1	22	0	0	1	0	1	12	0	38
845-900	0	0	0	0	16	0	0	0	1	0	19	0	36
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	0	2	0	0	104	0	1	1	2	0	98	0	208
715-815	0	3	0	3	108	0	2	0	1	0	101	0	218
730-830	0	2	0	3	94	1	1	0	1	0	98	1	201
745-845	0	1	1	4	89	1	1	1	1	1	77	1	178
800-900	0	1	1	4	81	1	1	1	1	1	75	1	168



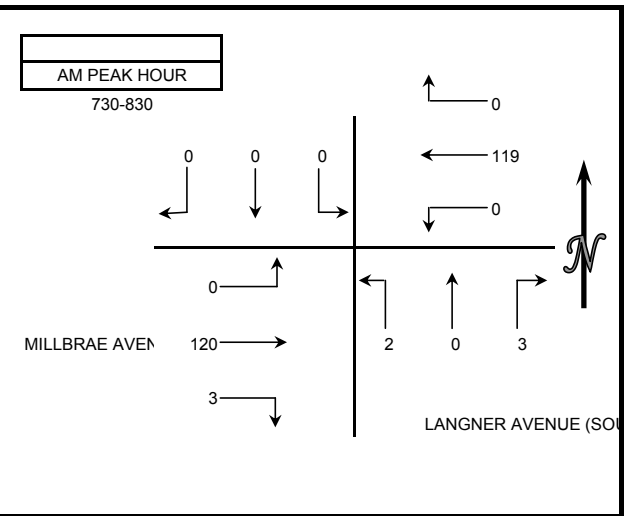
15 MIN COUNTS													
4:00 PM TO 6:00 PM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	0	0	0	3	38	1	0	0	0	0	16	0	58
415-430	0	0	1	1	41	1	0	8	0	1	32	0	85
430-445	0	0	2	2	43	3	0	2	0	1	34	1	88
445-500	0	0	1	1	49	0	0	0	0	0	31	0	82
500-515	1	1	0	4	58	0	0	0	1	1	21	1	88
515-530	0	0	0	5	41	1	0	0	0	0	36	0	83
530-545	2	1	1	0	37	0	2	2	0	0	37	0	82
545-600	0	0	3	0	40	0	0	2	0	0	25	0	70
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	0	0	4	7	171	5	0	10	0	2	113	1	313
415-515	1	1	4	8	191	4	0	10	1	3	118	2	343
430-530	1	1	3	12	191	4	0	2	1	2	122	2	341
445-545	3	2	2	10	185	1	2	2	1	1	125	1	335
500-600	3	2	4	9	176	1	2	4	1	1	119	1	323



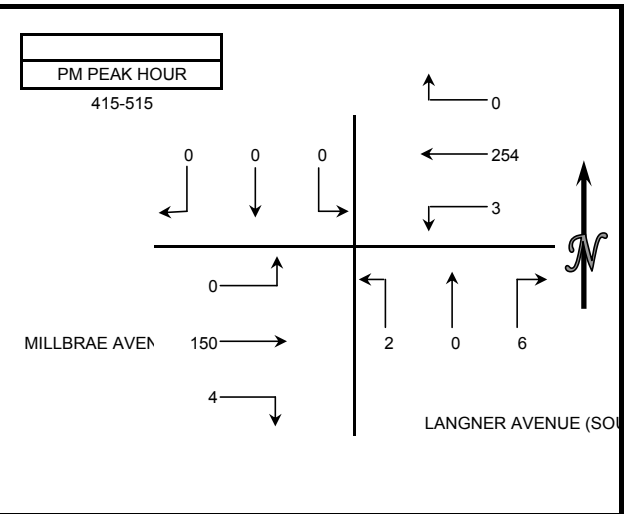
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN AND ASSOCIATES
 PROJECT: ROHNERT PARK
 DATE: WEDNESDAY, NOVEMBER 8TH 2006
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
 INTERSECTION: N/S LANGNER AVENUE (SOUTH)
 E/W MILLBRAE AVENUE

15 MIN COUNTS													
7:00 AM TO 9:00 AM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	0	0	0	0	13	0	0	0	1	0	16	0	30
715-730	0	0	0	0	20	0	2	0	0	0	29	0	51
730-745	0	0	0	0	33	0	2	0	1	0	29	0	65
745-800	0	0	0	0	33	0	1	0	0	1	34	0	69
800-815	0	0	0	0	29	0	0	0	1	0	29	0	59
815-830	0	0	0	0	24	0	0	0	0	2	28	0	54
830-845	0	0	0	0	19	1	0	0	0	2	27	0	49
845-900	0	0	0	0	18	1	1	0	0	4	25	0	49
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	0	0	0	0	99	0	5	0	2	1	108	0	215
715-815	0	0	0	0	115	0	5	0	2	1	121	0	244
730-830	0	0	0	0	119	0	3	0	2	3	120	0	247
745-845	0	0	0	0	105	1	1	0	1	5	118	0	231
800-900	0	0	0	0	90	2	1	0	1	8	109	0	211



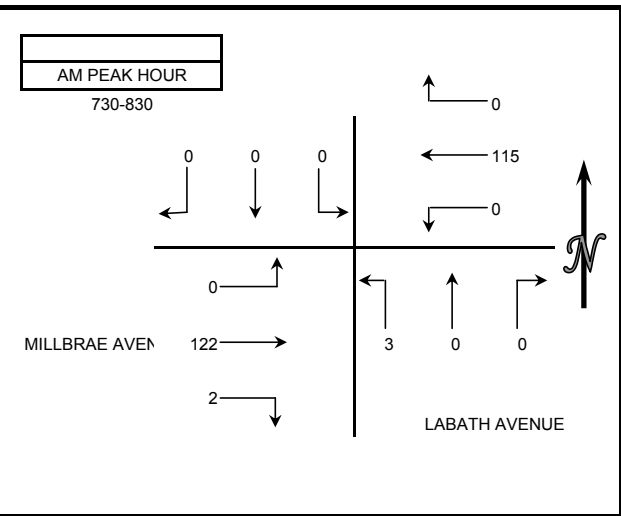
15 MIN COUNTS													
4:00 PM TO 6:00 PM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	0	0	0	0	54	0	0	0	1	0	18	0	73
415-430	0	0	0	0	60	0	2	0	0	2	36	0	100
430-445	0	0	0	0	65	1	1	0	0	1	36	0	104
445-500	0	0	0	0	66	1	3	0	0	1	41	0	112
500-515	0	0	0	0	63	1	0	0	2	0	37	0	103
515-530	0	0	0	0	59	0	2	0	2	1	33	0	97
530-545	0	0	0	0	55	0	0	0	0	0	41	0	96
545-600	0	0	0	0	51	0	0	0	0	2	32	0	85
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	0	0	0	0	245	2	6	0	1	4	131	0	389
415-515	0	0	0	0	254	3	6	0	2	4	150	0	419
430-530	0	0	0	0	253	3	6	0	4	3	147	0	416
445-545	0	0	0	0	243	2	5	0	4	2	152	0	408
500-600	0	0	0	0	228	1	2	0	4	3	143	0	381



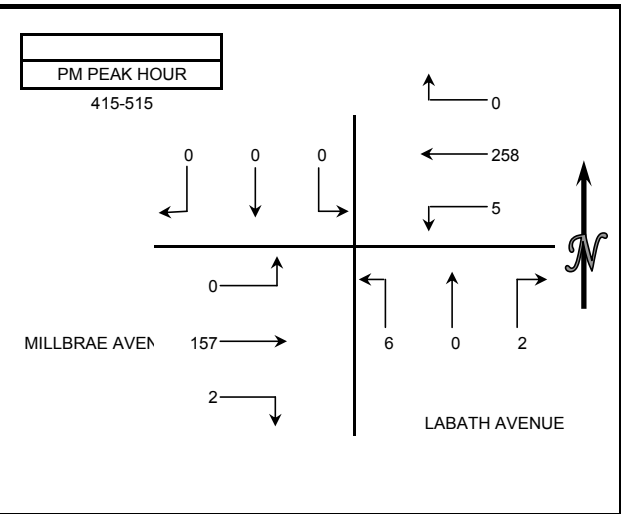
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN AND ASSOCIATES
 PROJECT: ROHNERT PARK
 DATE: WEDNESDAY, NOVEMBER 8TH 2006
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
 INTERSECTION: N/S LABATH AVENUE
 E/W MILLBRAE AVENUE

15 MIN COUNTS													
7:00 AM TO 9:00 AM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	0	0	0	0	16	0	0	0	2	0	13	0	31
715-730	0	0	0	0	20	1	0	0	0	0	25	0	46
730-745	0	0	0	0	35	0	0	0	0	1	34	0	70
745-800	0	0	0	0	28	0	0	0	0	1	38	0	67
800-815	0	0	0	0	25	0	0	0	3	0	23	0	51
815-830	0	0	0	0	27	0	0	0	0	0	27	0	54
830-845	0	0	0	0	21	0	0	0	0	1	28	0	50
845-900	0	0	0	0	28	0	2	0	0	2	29	0	61
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	0	0	0	0	99	1	0	0	2	2	110	0	214
715-815	0	0	0	0	108	1	0	0	3	2	120	0	234
730-830	0	0	0	0	115	0	0	0	3	2	122	0	242
745-845	0	0	0	0	101	0	0	0	3	2	116	0	222
800-900	0	0	0	0	101	0	2	0	3	3	107	0	216



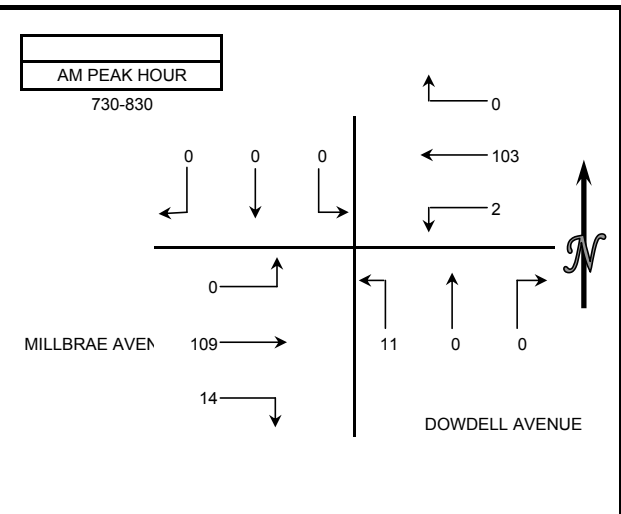
15 MIN COUNTS													
4:00 PM TO 6:00 PM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	0	0	0	0	52	5	1	0	0	2	26	0	86
415-430	0	0	0	0	58	1	0	0	1	0	38	0	98
430-445	0	0	0	0	69	1	0	0	2	0	42	0	114
445-500	0	0	0	0	53	0	0	0	1	2	40	0	96
500-515	0	0	0	0	78	3	2	0	2	0	37	0	122
515-530	0	0	0	0	50	0	1	0	1	0	33	0	85
530-545	0	0	0	0	50	0	0	0	1	4	39	0	94
545-600	0	0	0	0	48	1	0	0	3	0	39	0	91
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	0	0	0	0	232	7	1	0	4	4	146	0	394
415-515	0	0	0	0	258	5	2	0	6	2	157	0	430
430-530	0	0	0	0	250	4	3	0	6	2	152	0	417
445-545	0	0	0	0	231	3	3	0	5	6	149	0	397
500-600	0	0	0	0	226	4	3	0	7	4	148	0	392



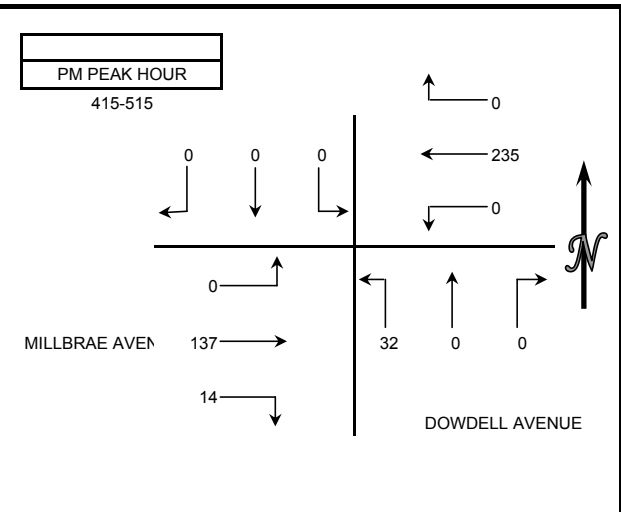
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY-HORN AND ASSOCIATES
 PROJECT: ROHNERT PARK
 DATE: WEDNESDAY, NOVEMBER 8TH 2006
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
 INTERSECTION: N/S DOWDELL AVENUE
 E/W MILLBRAE AVENUE

15 MIN COUNTS													
7:00 AM TO 9:00 AM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-715	0	0	0	0	16	0	0	0	2	2	14	0	34
715-730	0	0	0	0	25	1	1	0	3	1	24	0	55
730-745	0	0	0	0	31	0	0	0	2	2	29	0	64
745-800	0	0	0	0	27	1	0	0	1	4	30	0	63
800-815	0	0	0	0	22	0	0	0	1	3	24	0	50
815-830	0	0	0	0	23	1	0	0	7	5	26	0	62
830-845	0	0	0	0	22	0	0	0	1	5	15	0	43
845-900	0	0	0	0	20	0	1	0	2	2	19	0	44
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
700-800	0	0	0	0	99	2	1	0	8	9	97	0	216
715-815	0	0	0	0	105	2	1	0	7	10	107	0	232
730-830	0	0	0	0	103	2	0	0	11	14	109	0	239
745-845	0	0	0	0	94	2	0	0	10	17	95	0	218
800-900	0	0	0	0	87	1	1	0	11	15	84	0	199



15 MIN COUNTS													
4:00 PM TO 6:00 PM													
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-415	0	0	0	0	51	1	1	0	7	2	25	0	87
415-430	0	0	0	0	50	0	0	0	9	7	30	0	96
430-445	0	0	0	0	62	0	0	0	6	3	35	0	106
445-500	0	0	0	0	64	0	0	0	6	3	35	0	108
500-515	0	0	0	0	59	0	0	0	11	1	37	0	108
515-530	0	0	0	0	38	2	0	0	6	4	37	0	87
530-545	0	0	0	0	46	2	0	0	8	4	36	0	96
545-600	0	0	0	0	42	0	1	0	9	3	32	0	87
HOOR TOTALS													
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL
400-500	0	0	0	0	227	1	1	0	28	15	125	0	397
415-515	0	0	0	0	235	0	0	0	32	14	137	0	418
430-530	0	0	0	0	223	2	0	0	29	11	144	0	409
445-545	0	0	0	0	207	4	0	0	31	12	145	0	399
500-600	0	0	0	0	185	4	1	0	34	12	142	0	378



**EXISTING CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	4	11	63	5	54	10	852	46	53	523	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	4	12	66	5	57	11	897	48	56	551	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1612	1629	552	1618	1606	921	553			945		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1612	1629	552	1618	1606	921	553			945		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	98	10	95	83	99			92		
cM capacity (veh/h)	62	93	534	73	96	328	1017			726		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	16	128	11	945	56	553						
Volume Left	0	66	11	0	56	0						
Volume Right	12	57	0	48	0	2						
cSH	236	118	1017	1700	726	1700						
Volume to Capacity	0.07	1.09	0.01	0.56	0.08	0.33						
Queue Length 95th (ft)	5	191	1	0	6	0						
Control Delay (s)	21.4	180.8	8.6	0.0	10.4	0.0						
Lane LOS	C	F	A		B							
Approach Delay (s)	21.4	180.8	0.1		1.0							
Approach LOS	C	F										
Intersection Summary												
Average Delay		14.2										
Intersection Capacity Utilization		64.7%		ICU Level of Service		C						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	17	10	10	51	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	18	11	11	54	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	64			28			140	129	23	140	129	59
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			28			140	129	23	140	129	59
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	99	99	99	99	99
cM capacity (veh/h)	1538			1585			804	751	1054	805	751	1007
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	39	75	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1538	1585	851	841								
Volume to Capacity	0.01	0.01	0.04	0.04								
Queue Length 95th (ft)	1	1	3	3								
Control Delay (s)	2.0	1.1	9.4	9.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	2.0	1.1	9.4	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay		4.3										
Intersection Capacity Utilization		14.4%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	17	10	10	51	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	18	11	11	54	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	64			28			140	129	23	140	129	59
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			28			140	129	23	140	129	59
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	99	99	99	99	99
cM capacity (veh/h)	1538			1585			804	751	1054	805	751	1007
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	39	75	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1538	1585	851	841								
Volume to Capacity	0.01	0.01	0.04	0.04								
Queue Length 95th (ft)	1	1	3	3								
Control Delay (s)	2.0	1.1	9.4	9.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	2.0	1.1	9.4	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			14.4%		ICU Level of Service		A					
Analysis Period (min)			15									

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	17	10	10	51	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	18	11	11	54	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	64			28			140	129	23	140	129	59
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			28			140	129	23	140	129	59
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	99	99	99	99	99
cM capacity (veh/h)	1538			1585			804	751	1054	805	751	1007
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	39	75	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1538	1585	851	841								
Volume to Capacity	0.01	0.01	0.04	0.04								
Queue Length 95th (ft)	1	1	3	3								
Control Delay (s)	2.0	1.1	9.4	9.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	2.0	1.1	9.4	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			14.4%		ICU Level of Service		A					
Analysis Period (min)			15									

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	8	0	0	71	4	1	0	2	6	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	0	0	75	4	1	0	2	6	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	79			8			86	87	8	87	85	77
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	79			8			86	87	8	87	85	77
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1519			1612			899	803	1073	896	805	984
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	79	3	7								
Volume Left	0	0	1	6								
Volume Right	0	4	2	0								
cSH	1519	1612	1008	882								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (ft)	0	0	0	1								
Control Delay (s)	0.0	0.0	8.6	9.1								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	8.6	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization		14.0%		ICU Level of Service		A						
Analysis Period (min)		15										






















6: Wilfred Ave &
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	18	1	0	62	9	1	3	5	11	2	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	19	1	0	65	9	1	3	5	12	2	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked												
vC, conflicting volume	75			20			99	96	19	98	92	70
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			20			99	96	19	98	92	70
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	99
cM capacity (veh/h)	1525			1596			875	793	1059	876	797	993
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	21	75	9	20								
Volume Left	1	0	1	12								
Volume Right	1	9	5	6								
cSH	1525	1596	933	900								
Volume to Capacity	0.00	0.00	0.01	0.02								
Queue Length 95th (ft)	0	0	1	2								
Control Delay (s)	0.4	0.0	8.9	9.1								
Lane LOS	A		A	A								
Approach Delay (s)	0.4	0.0	8.9	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization		14.2%		ICU Level of Service		A						
Analysis Period (min)		15										
























7: Wilfred Ave & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		1.00			1.00	0.88	1.00	0.95	1.00	1.00	0.95		
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1720			1778	2787	1770	3539	1583	1770	3492		
Flt Permitted		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)		1720			1778	2787	1770	3539	1583	1770	3492		
Volume (vph)	4	9	13	187	9	570	35	515	59	221	364	35	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	4	9	14	197	9	600	37	542	62	233	383	37	
RTOR Reduction (vph)	0	13	0	0	0	373	0	0	50	0	8	0	
Lane Group Flow (vph)	0	14	0	0	206	227	37	542	12	233	412	0	
Turn Type	Split			Split		Perm	Prot		Perm	Prot			
Protected Phases	4	4		8	8		5	2		1	6		
Permitted Phases						8			2				
Actuated Green, G (s)		2.9			29.8	29.8	4.8	15.2	15.2	14.1	24.5		
Effective Green, g (s)		3.4			30.3	30.3	5.3	15.7	15.7	14.6	25.0		
Actuated g/C Ratio		0.04			0.38	0.38	0.07	0.20	0.20	0.18	0.31		
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		73			673	1056	117	695	311	323	1091		
v/s Ratio Prot		c0.01			c0.12		0.02	c0.15		c0.13	0.12		
v/s Ratio Perm						0.08			0.01				
v/c Ratio		0.19			0.31	0.22	0.32	0.78	0.04	0.72	0.38		
Uniform Delay, d1		37.0			17.5	16.8	35.6	30.5	26.0	30.8	21.4		
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.72	0.62		
Incremental Delay, d2		1.2			1.2	0.5	1.6	5.5	0.1	4.4	0.1		
Delay (s)		38.2			18.6	17.3	37.2	36.1	26.1	26.6	13.5		
Level of Service		D			B	B	D	D	C	C	B		
Approach Delay (s)		38.2			17.6			35.2			18.1		
Approach LOS		D			B			D			B		
Intersection Summary													
HCM Average Control Delay		23.3			HCM Level of Service				C				
HCM Volume to Capacity ratio		0.51											
Actuated Cycle Length (s)		80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization		54.0%			ICU Level of Service				A				
Analysis Period (min)		15											
c Critical Lane Group													













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3269		1770	3539	1583	1770	3529	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3269		1770	3539	1583	1770	3529	
Volume (vph)	4	127	36	268	235	244	40	121	618	261	149	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	134	38	282	247	257	42	127	651	275	157	3
RTOR Reduction (vph)	0	0	32	0	197	0	0	0	352	0	1	0
Lane Group Flow (vph)	4	134	6	282	307	0	42	127	299	275	159	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.3	12.9	12.9	6.5	18.1		3.5	25.8	25.8	16.8	39.1	
Effective Green, g (s)	1.8	13.4	13.4	7.0	18.6		4.0	26.3	26.3	17.3	39.6	
Actuated g/C Ratio	0.02	0.17	0.17	0.09	0.23		0.05	0.33	0.33	0.22	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	312	265	155	760		89	1163	520	383	1747	
v/s Ratio Prot	0.00	0.07		c0.16	c0.09		0.02	0.04		c0.16	0.05	
v/s Ratio Perm			0.00						c0.19			
v/c Ratio	0.10	0.43	0.02	1.82	0.40		0.47	0.11	0.57	0.72	0.09	
Uniform Delay, d1	38.3	29.9	27.8	36.5	26.0		37.0	18.7	22.2	29.1	10.7	
Progression Factor	1.00	1.00	1.00	1.29	1.20		0.91	0.97	1.99	1.00	1.00	
Incremental Delay, d2	1.1	1.0	0.0	389.0	0.3		3.2	0.2	3.8	6.3	0.1	
Delay (s)	39.4	30.8	27.9	436.0	31.6		36.8	18.3	48.1	35.4	10.8	
Level of Service	D	C	C	F	C		D	B	D	D	B	
Approach Delay (s)		30.4			176.7			42.9			26.3	
Approach LOS		C			F			D			C	
Intersection Summary												
HCM Average Control Delay			86.1			HCM Level of Service				F		
HCM Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			69.4%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												












10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	1863	1583	1770	1863
Volume (vph)	390	447	309	571	547	463
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	411	471	325	601	576	487
RTOR Reduction (vph)	0	380	0	331	0	0
Lane Group Flow (vph)	411	91	325	270	576	487
Turn Type	Perm		Perm		Prot	
Protected Phases	3		2		1	
Permitted Phases	3		2			
Actuated Green, G (s)	15.0	15.0	35.5	35.5	16.0	56.0
Effective Green, g (s)	15.5	15.5	36.0	36.0	16.5	56.5
Actuated g/C Ratio	0.19	0.19	0.45	0.45	0.21	0.71
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	665	307	838	712	365	1316
v/s Ratio Prot	c0.12		0.17		c0.33	
v/s Ratio Perm	0.06		0.17			
v/c Ratio	0.62	0.30	0.39	0.38	1.58	0.37
Uniform Delay, d1	29.5	27.6	14.7	14.6	31.8	4.7
Progression Factor	1.31	5.16	0.95	3.74	0.95	0.62
Incremental Delay, d2	1.7	0.5	1.3	1.5	269.5	0.6
Delay (s)	40.4	143.0	15.2	56.0	299.8	3.5
Level of Service	D	F	B	E	F	A
Approach Delay (s)	95.2		41.7		164.1	
Approach LOS	F		D		F	
Intersection Summary						
HCM Average Control Delay			103.4	HCM Level of Service		F
HCM Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			80.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			72.3%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3493		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3493		1770	1583
Volume (vph)	189	886	483	47	116	172
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	199	933	508	49	122	181
RTOR Reduction (vph)	0	0	8	0	0	133
Lane Group Flow (vph)	199	933	549	0	122	48
Turn Type	Prot			Perm		
Protected Phases	7			6		
Permitted Phases				6		
Actuated Green, G (s)	14.2	50.5	31.8		20.5	20.5
Effective Green, g (s)	14.7	51.0	32.3		21.0	21.0
Actuated g/C Ratio	0.18	0.64	0.40		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	325	2256	1410		465	416
v/s Ratio Prot	c0.11	c0.26	0.16		c0.07	
v/s Ratio Perm						0.03
v/c Ratio	0.61	0.41	0.39		0.26	0.11
Uniform Delay, d1	30.0	7.1	16.9		23.4	22.4
Progression Factor	1.38	0.60	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.1	0.8		1.4	0.6
Delay (s)	41.9	4.3	17.7		24.7	23.0
Level of Service	D	A	B		C	C
Approach Delay (s)	10.9		17.7		23.7	
Approach LOS	B		B		C	
Intersection Summary						
HCM Average Control Delay	14.8		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.40					
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	41.7%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1687	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	295	3	29	8	3	5	501	548	2	7	429	468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	311	3	31	8	3	5	527	577	2	7	452	493
RTOR Reduction (vph)	0	0	26	0	5	0	0	0	0	0	0	361
Lane Group Flow (vph)	156	158	5	0	11	0	527	579	0	7	452	132
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.5	12.5	12.5		1.5		27.1	46.5		1.5	20.9	20.9
Effective Green, g (s)	13.0	13.0	13.0		2.0		27.6	47.0		2.0	21.4	21.4
Actuated g/C Ratio	0.16	0.16	0.16		0.02		0.35	0.59		0.02	0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	273	274	257		44		611	2078		44	947	423
v/s Ratio Prot	0.09	c0.09			c0.01		c0.30	0.16		0.00	c0.13	
v/s Ratio Perm			0.00									0.08
v/c Ratio	0.57	0.58	0.02		0.25		0.86	0.28		0.16	0.48	0.31
Uniform Delay, d1	30.9	31.0	28.1		38.3		24.4	8.1		38.2	24.6	23.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.19	0.81	1.82
Incremental Delay, d2	2.9	2.9	0.0		3.0		12.0	0.3		1.5	1.6	1.7
Delay (s)	33.8	33.9	28.2		41.3		36.4	8.5		47.0	21.4	44.5
Level of Service	C	C	C		D		D	A		D	C	D
Approach Delay (s)		33.3			41.3			21.8			33.5	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		28.2										
HCM Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		70.1%										
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	WBL	WBR	NBT	NBR	SBL	SBT
Movement						
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	908	0	0	597
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	956	0	0	628
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1584	956			956	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1584	956			956	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	119	313			719	
Direction, Lane #						
Volume Total	0	956	628			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.56	0.37			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			51.1%		ICU Level of Service	A
Analysis Period (min)			15			

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↱	↱
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	138	22	14	452	496	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	145	23	15	476	522	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	811	283	565			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	811	283	565			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	54	97	99			
cM capacity (veh/h)	313	714	1003			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	145	23	15	238	238	348 217
Volume Left	145	0	15	0	0	0 0
Volume Right	0	23	0	0	0	0 43
cSH	313	714	1003	1700	1700	1700 1700
Volume to Capacity	0.46	0.03	0.01	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	59	3	1	0	0	0 0
Control Delay (s)	26.1	10.2	8.6	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	23.9		0.3			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization		29.3%		ICU Level of Service		A
Analysis Period (min)		15				

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	289	321	523	251	204	340
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	304	338	551	264	215	358
RTOR Reduction (vph)	0	261	0	151	0	0
Lane Group Flow (vph)	304	77	551	113	215	358
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1 6	
Permitted Phases	8		2			
Actuated Green, G (s)	14.0	14.0	26.7	26.7	9.3	40.5
Effective Green, g (s)	14.5	14.5	27.2	27.2	9.8	41.0
Actuated g/C Ratio	0.23	0.23	0.43	0.43	0.15	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	361	798	678	273	1203
v/s Ratio Prot	c0.17		c0.30		c0.12 0.19	
v/s Ratio Perm	0.05		0.07			
v/c Ratio	0.75	0.21	0.69	0.17	0.79	0.30
Uniform Delay, d1	22.8	19.9	14.7	11.2	25.8	4.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7	0.3	4.9	0.5	13.9	0.6
Delay (s)	30.6	20.2	19.6	11.7	39.8	5.6
Level of Service	C	C	B	B	D	A
Approach Delay (s)	25.1		17.0			18.4
Approach LOS	C		B			B
Intersection Summary						
HCM Average Control Delay		20.0		HCM Level of Service		B
HCM Volume to Capacity ratio		0.73				
Actuated Cycle Length (s)		63.5		Sum of lost time (s)		12.0
Intersection Capacity Utilization		64.8%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1553	1504	1770	1669	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1553	1504	1770	1669	
Volume (vph)	36	531	44	116	490	51	61	13	123	236	45	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	559	46	122	516	54	64	14	129	248	47	106
RTOR Reduction (vph)	0	0	36	0	0	42	0	49	53	0	57	0
Lane Group Flow (vph)	38	559	10	122	516	12	64	27	14	248	96	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	16.5	16.5	4.4	17.6	17.6	4.5	16.8	16.8	24.3	36.6	
Effective Green, g (s)	3.8	17.0	17.0	4.9	18.1	18.1	5.0	17.3	17.3	24.8	37.1	
Actuated g/C Ratio	0.05	0.21	0.21	0.06	0.23	0.23	0.06	0.22	0.22	0.31	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	752	336	210	801	358	215	336	325	549	774	
v/s Ratio Prot	0.02	c0.16		0.04	c0.15		c0.02	0.02		c0.14	c0.06	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.45	0.74	0.03	0.58	0.64	0.03	0.30	0.08	0.04	0.45	0.12	
Uniform Delay, d1	37.1	29.5	25.0	36.6	28.0	24.1	35.8	25.0	24.8	22.1	12.2	
Progression Factor	1.00	1.00	1.00	0.73	0.56	0.22	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	4.0	0.0	3.6	1.6	0.0	0.8	0.5	0.3	0.6	0.3	
Delay (s)	40.9	33.5	25.0	30.3	17.1	5.3	36.6	25.5	25.1	22.7	12.5	
Level of Service	D	C	C	C	B	A	D	C	C	C	B	
Approach Delay (s)		33.3			18.5			28.8			18.8	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM Average Control Delay		24.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		47.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												
























18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3126	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3126	1441	3433	1863	1583
Volume (vph)	203	748	113	317	563	361	89	157	340	432	205	232
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	214	787	119	334	593	380	94	165	358	455	216	244
RTOR Reduction (vph)	0	0	82	0	0	263	0	156	156	0	0	188
Lane Group Flow (vph)	214	787	37	334	593	117	94	188	23	455	216	56
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	24.6	24.6	11.5	24.1	24.1	8.2	10.0	10.0	15.9	17.7	17.7
Effective Green, g (s)	12.5	25.1	25.1	12.0	24.6	24.6	8.7	10.5	10.5	16.4	18.2	18.2
Actuated g/C Ratio	0.16	0.31	0.31	0.15	0.31	0.31	0.11	0.13	0.13	0.20	0.23	0.23
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	1595	497	515	1088	487	192	410	189	704	424	360
v/s Ratio Prot	c0.12	0.15		0.10	c0.17		0.05	0.06		c0.13	c0.12	
v/s Ratio Perm			0.02			0.07			0.02			0.04
v/c Ratio	0.77	0.49	0.08	0.65	0.55	0.24	0.49	0.46	0.12	0.65	0.51	0.15
Uniform Delay, d1	32.4	22.3	19.3	32.0	23.0	20.7	33.6	32.1	30.7	29.1	27.0	24.7
Progression Factor	0.73	0.62	0.48	0.78	0.67	1.19	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	1.0	0.3	2.4	1.7	1.0	2.0	0.8	0.3	2.0	1.0	0.2
Delay (s)	34.7	14.8	9.4	27.3	17.1	25.7	35.5	32.9	31.0	31.2	28.0	24.9
Level of Service	C	B	A	C	B	C	D	C	C	C	C	C
Approach Delay (s)		18.1			22.2			32.8			28.8	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay		24.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		60.4%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												
























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4968		1610	3327	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4968		1610	3327	1583	1610	3390	1583
Volume (vph)	268	1120	542	117	766	140	377	275	203	102	230	157
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	282	1179	571	123	806	147	397	289	214	107	242	165
RTOR Reduction (vph)	0	0	383	0	30	0	0	0	172	0	0	140
Lane Group Flow (vph)	282	1179	188	123	923	0	221	465	42	107	242	25
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.6	25.8	25.8	9.4	22.6		15.3	15.3	15.3	11.5	11.5	11.5
Effective Green, g (s)	13.1	26.3	26.3	9.9	23.1		15.8	15.8	15.8	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.33	0.33	0.12	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	562	1163	520	219	1435		318	657	313	242	509	237
v/s Ratio Prot	0.08	c0.33		0.07	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.12						0.03			0.02
v/c Ratio	0.50	1.01	0.36	0.56	0.64		0.69	0.71	0.14	0.44	0.48	0.10
Uniform Delay, d1	30.5	26.9	20.4	33.0	24.9		29.9	29.9	26.5	31.0	31.1	29.4
Progression Factor	0.79	0.80	2.93	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	28.9	1.8	3.3	2.2		6.5	3.5	0.2	1.3	0.7	0.2
Delay (s)	24.7	50.4	61.8	36.3	27.1		36.3	33.4	26.7	32.2	31.8	29.6
Level of Service	C	D	E	D	C		D	C	C	C	C	C
Approach Delay (s)		50.0			28.1			32.5			31.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay	39.2			HCM Level of Service						D		
HCM Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	69.5%			ICU Level of Service						C		
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3372		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3372		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	113	373	172	115	510	93	319	509	101	83	326	201
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	393	181	121	537	98	336	536	106	87	343	212
RTOR Reduction (vph)	0	80	0	0	0	77	0	0	65	0	0	157
Lane Group Flow (vph)	119	494	0	121	537	21	336	536	41	87	343	55
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.5	14.5		5.5	14.5	14.5	13.5	25.9	25.9	5.1	17.5	17.5
Effective Green, g (s)	6.0	15.0		6.0	15.0	15.0	14.0	26.4	26.4	5.6	18.0	18.0
Actuated g/C Ratio	0.09	0.22		0.09	0.22	0.22	0.20	0.38	0.38	0.08	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	154	733		154	769	344	359	713	606	144	486	413
v/s Ratio Prot	0.07	0.15		c0.07	c0.15		c0.19	c0.29		0.05	0.18	
v/s Ratio Perm						0.01			0.03			0.03
v/c Ratio	0.77	0.67		0.79	0.70	0.06	0.94	0.75	0.07	0.60	0.71	0.13
Uniform Delay, d1	30.8	24.8		30.9	24.9	21.4	27.1	18.5	13.5	30.6	23.1	19.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.0	2.5		22.6	2.8	0.1	31.2	7.2	0.2	7.0	8.4	0.7
Delay (s)	51.9	27.2		53.5	27.7	21.5	58.3	25.6	13.7	37.6	31.5	20.2
Level of Service	D	C		D	C	C	E	C	B	D	C	C
Approach Delay (s)		31.4			31.0			35.6			28.6	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay	32.1			HCM Level of Service				C				
HCM Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	69.0			Sum of lost time (s)				12.0				
Intersection Capacity Utilization	70.3%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3508		1770	3539	1583	1770	1656		1770	1654	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3508		1770	3539	1583	1770	1656		1770	1654	
Volume (vph)	78	525	32	53	663	249	48	22	63	376	28	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	553	34	56	698	262	51	23	66	396	29	86
RTOR Reduction (vph)	0	4	0	0	0	101	0	61	0	0	58	0
Lane Group Flow (vph)	82	583	0	56	698	161	51	28	0	396	57	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.2	35.7		4.4	32.9	32.9	3.3	6.2		25.7	28.6	
Effective Green, g (s)	7.7	36.2		4.9	33.4	33.4	3.8	6.7		26.2	29.1	
Actuated g/C Ratio	0.09	0.40		0.05	0.37	0.37	0.04	0.07		0.29	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	1411		96	1313	587	75	123		515	535	
v/s Ratio Prot	c0.05	0.17		0.03	c0.20		c0.03	0.02		c0.22	c0.03	
v/s Ratio Perm						0.10						
v/c Ratio	0.54	0.41		0.58	0.53	0.27	0.68	0.23		0.77	0.11	
Uniform Delay, d1	39.5	19.3		41.6	22.2	19.8	42.5	39.2		29.1	21.3	
Progression Factor	1.00	1.00		0.68	0.54	0.16	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	0.9		8.3	1.5	1.1	22.4	0.9		6.8	0.1	
Delay (s)	43.4	20.2		36.5	13.5	4.2	64.9	40.2		35.9	21.4	
Level of Service	D	C		D	B	A	E	D		D	C	
Approach Delay (s)		23.0			12.3			49.2			32.7	
Approach LOS		C			B			D			C	
Intersection Summary												
HCM Average Control Delay		22.1							C			
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		90.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		60.1%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	687	285	99	767	0	0	0	0	617	0	182
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	723	300	104	807	0	0	0	0	649	0	192
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	0	0	123	0
Lane Group Flow (vph)	0	723	210	104	807	0	0	0	0	649	69	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.20		0.06	c0.23					c0.19	0.04	
v/s Ratio Perm			0.13									
v/c Ratio		0.50	0.32	0.44	0.39					0.59	0.14	
Uniform Delay, d1		19.7	18.1	35.8	9.9					25.5	21.6	
Progression Factor		0.73	0.75	1.28	1.68					1.00	1.00	
Incremental Delay, d2		1.0	1.1	1.2	0.5					0.8	0.6	
Delay (s)		15.4	14.6	46.9	17.1					26.3	22.2	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		15.2			20.5			0.0			25.4	
Approach LOS		B			C			A			C	
Intersection Summary												
HCM Average Control Delay			20.0						B			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)		8.0				
Intersection Capacity Utilization			60.5%			ICU Level of Service		B				
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Volume (vph)	1303	0	0	545	321	199
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1372	0	0	574	338	209
RTOR Reduction (vph)	0	0	0	0	0	29
Lane Group Flow (vph)	1372	0	0	574	338	180
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	59.4			59.4	21.6	21.6
Effective Green, g (s)	59.9			59.9	22.1	22.1
Actuated g/C Ratio	0.67			0.67	0.25	0.25
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2355			2355	435	389
v/s Ratio Prot	c0.39			0.16	c0.19	
v/s Ratio Perm						0.11
v/c Ratio	0.58			0.24	0.78	0.46
Uniform Delay, d1	8.2			6.0	31.7	28.9
Progression Factor	0.71			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.2	8.5	0.9
Delay (s)	6.7			6.3	40.1	29.8
Level of Service	A			A	D	C
Approach Delay (s)	6.7			6.3	36.2	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay	13.1				HCM Level of Service	B
HCM Volume to Capacity ratio	0.64					
Actuated Cycle Length (s)	90.0				Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.5%				ICU Level of Service	B
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↑↑	↕	↕	↕	↕
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	9	5	11	1	6	180	18	728	12	117	525	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	5	12	1	6	189	19	766	13	123	553	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1322	1619	280	1341	1611	383	560			779		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1322	1619	280	1341	1611	383	560			779		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	94	98	99	93	69	98			85		
cM capacity (veh/h)	65	85	717	91	87	615	1007			834		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	26	197	19	383	383	13	123	368	192			
Volume Left	9	1	19	0	0	0	123	0	0			
Volume Right	12	189	0	0	0	13	0	0	7			
cSH	118	639	1007	1700	1700	1700	834	1700	1700			
Volume to Capacity	0.22	0.31	0.02	0.23	0.23	0.01	0.15	0.22	0.11			
Queue Length 95th (ft)	20	33	1	0	0	0	13	0	0			
Control Delay (s)	43.9	14.8	8.6	0.0	0.0	0.0	10.1	0.0	0.0			
Lane LOS	E	B	A				B					
Approach Delay (s)	43.9	14.8	0.2				1.8					
Approach LOS	E	B										
Intersection Summary												
Average Delay				3.2								
Intersection Capacity Utilization			44.7%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	133	3	3	182	2	1	0	1	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	140	3	3	192	2	1	0	1	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	194			143			345	346	142	346	346	193
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	194			143			345	346	142	346	346	193
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1380			1439			606	575	906	606	575	849
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	145	197	2	2								
Volume Left	2	3	1	1								
Volume Right	3	2	1	0								
cSH	1380	1439	727	590								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.1	10.0	11.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.1	0.1	10.0	11.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			21.4%		ICU Level of Service		A					
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	118	3	4	191	8	1	10	0	4	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	124	3	4	201	8	1	11	0	4	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	209			127			345	348	126	349	345	205
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			127			345	348	126	349	345	205
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1361			1459			605	573	925	595	575	835
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	129	214	12	6								
Volume Left	2	4	1	4								
Volume Right	3	8	0	1								
cSH	1361	1459	576	621								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.2	11.4	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.4	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			22.7%		ICU Level of Service		A					
Analysis Period (min)			15									

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	150	4	3	254	2	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	4	3	267	2	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			162		434	160
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			162		434	160
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1417		578	885
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	162	271	8			
Volume Left	0	3	2			
Volume Right	4	0	6			
cSH	1700	1417	781			
Volume to Capacity	0.10	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.1	9.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.7			
Approach LOS		A				
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization		25.8%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	157	2	5	258	0	6	0	2	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	165	2	5	272	0	6	0	2	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	272			167			448	448	166	451	449	272
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272			167			448	448	166	451	449	272
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1292			1410			519	504	878	516	503	767
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	167	277	8	0								
Volume Left	0	5	6	0								
Volume Right	2	0	2	0								
cSH	1292	1410	578	1700								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.0	0.2	11.3	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.2	11.3	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization		27.6%		ICU Level of Service	A							
Analysis Period (min)		15										

31: Millbrae Ave &
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	137	14	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	144	15	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			159		399	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		399	152
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1420		607	895
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	159	247	34			
Volume Left	0	0	34			
Volume Right	15	0	0			
cSH	1700	1420	607			
Volume to Capacity	0.09	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Ave & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	206	600	37	542	62	233	420
v/c Ratio	0.17	0.27	0.39	0.22	0.78	0.17	0.82	0.38
Control Delay	24.6	17.9	2.7	36.0	39.1	9.0	39.8	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	17.9	2.7	36.0	39.1	9.0	39.8	14.4
Queue Length 50th (ft)	6	57	0	17	134	0	125	54
Queue Length 95th (ft)	29	134	36	44	189	30	m136	m55
Internal Link Dist (ft)	550	220			110			270
Turn Bay Length (ft)				150		100	275	
Base Capacity (vph)	366	772	1550	266	730	376	290	1099
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.27	0.39	0.14	0.74	0.16	0.80	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	↖	→	↘	↙	←	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	4	134	38	282	504	42	127	651	275	160
v/c Ratio	0.03	0.48	0.14	1.82	0.53	0.25	0.10	0.71	0.72	0.08
Control Delay	34.2	36.0	10.4	418.1	16.3	33.2	16.0	13.0	46.7	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	36.0	10.4	418.1	16.3	33.2	16.0	13.0	46.7	11.4
Queue Length 50th (ft)	2	63	0	~223	37	18	27	173	132	14
Queue Length 95th (ft)	11	103	23	m#372	82	m25	m44	m259	#342	47
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	405	155	1046	398	1327	922	382	2030
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.30	0.09	1.82	0.48	0.11	0.10	0.71	0.72	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.


95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	411	471	325	601	576	487
v/c Ratio	0.62	0.69	0.39	0.58	1.58	0.37
Control Delay	42.2	20.5	15.6	7.7	295.2	4.0
Queue Delay	0.0	0.1	0.0	0.3	0.0	0.0
Total Delay	42.2	20.7	15.6	8.0	295.2	4.0
Queue Length 50th (ft)	109	91	133	103	~399	56
Queue Length 95th (ft)	153	198	104	93	#646	96
Internal Link Dist (ft)	345		380			270
Turn Bay Length (ft)	150				200	
Base Capacity (vph)	901	763	838	1043	365	1316
Starvation Cap Reductn	0	20	0	97	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.63	0.39	0.64	1.58	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

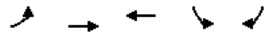
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK












Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	199	933	557	122	181
v/c Ratio	0.61	0.41	0.39	0.26	0.33
Control Delay	41.2	4.4	18.4	25.3	5.8
Queue Delay	0.0	0.3	0.0	0.0	0.0
Total Delay	41.2	4.7	18.4	25.3	5.8
Queue Length 50th (ft)	105	52	98	48	0
Queue Length 95th (ft)	m123	m74	157	93	46
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	465	2256	1417	465	549
Starvation Cap Reductn	0	652	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.58	0.39	0.26	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	156	158	31	16	527	579	7	452	493
v/c Ratio	0.57	0.58	0.11	0.11	0.99	0.24	0.05	0.36	0.56
Control Delay	38.5	38.6	10.7	29.3	67.7	8.0	40.3	18.4	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	38.5	38.6	10.7	29.3	67.7	8.0	40.3	18.4	8.1
Queue Length 50th (ft)	76	77	0	5	261	37	3	87	86
Queue Length 95th (ft)	127	128	21	23	#461	157	m9	#176	148
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	438	179	531	2397	177	1266	883
Starvation Cap Reductn	0	0	0	0	0	0	0	0	30
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.36	0.07	0.09	0.99	0.24	0.04	0.36	0.58
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									












16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	304	338	551	264	215	358
v/c Ratio	0.75	0.54	0.69	0.32	0.78	0.30
Control Delay	36.2	6.5	20.9	3.1	48.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	6.5	20.9	3.1	48.9	6.0
Queue Length 50th (ft)	110	0	174	0	83	56
Queue Length 95th (ft)	#210	57	282	38	#186	93
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	644	798	829	278	1204
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.52	0.69	0.32	0.77	0.30
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK













											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	559	46	122	516	54	64	76	67	248	153
v/c Ratio	0.28	0.78	0.13	0.47	0.64	0.13	0.24	0.18	0.16	0.47	0.17
Control Delay	40.8	38.8	9.4	31.7	19.3	2.4	37.3	11.0	8.4	26.3	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	38.8	9.4	31.7	19.3	2.4	37.3	11.0	8.4	26.3	5.7
Queue Length 50th (ft)	18	138	0	15	95	0	15	6	0	100	13
Queue Length 95th (ft)	47	194	26	43	141	m1	34	41	32	168	46
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	134	752	373	257	834	415	263	432	424	531	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.74	0.12	0.47	0.62	0.13	0.24	0.18	0.16	0.47	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	214	787	119	334	593	380	94	344	179	455	216	244
v/c Ratio	0.78	0.48	0.20	0.65	0.53	0.50	0.43	0.61	0.52	0.68	0.51	0.44
Control Delay	42.2	14.4	2.7	30.6	16.7	5.2	39.3	19.6	10.8	38.3	33.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	14.4	2.7	30.6	16.7	5.2	39.3	19.6	10.8	38.3	33.2	6.8
Queue Length 50th (ft)	60	64	2	90	127	45	43	42	0	109	101	0
Queue Length 95th (ft) m#137	76	m8	134	162	60	91	79	56	#210	165	56	56
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1653	595	515	1129	764	229	805	447	666	457	572
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.48	0.20	0.65	0.53	0.50	0.41	0.43	0.40	0.68	0.47	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1553	72	1035	209	24	364	365	336
v/c Ratio	0.66	0.51	0.51	0.13	0.05	0.84	0.88	0.58
Control Delay	8.6	49.9	10.5	0.2	9.4	43.0	48.8	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	49.9	10.5	0.2	9.4	43.0	48.8	20.2
Queue Length 50th (ft)	133	39	152	0	2	165	169	96
Queue Length 95th (ft)	168	m#56	220	m0	17	#311	#323	175
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2341	142	2017	1583	572	476	455	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.51	0.51	0.13	0.04	0.76	0.80	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	16	1744	260	1037	332	276	138	138	18
v/c Ratio	0.12	0.42	0.16	0.33	0.21	0.79	0.37	0.37	0.05
Control Delay	38.7	8.6	0.1	6.1	0.2	43.7	25.3	25.3	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	8.6	0.1	6.1	0.2	43.7	25.3	25.3	16.9
Queue Length 50th (ft)	8	167	0	68	0	131	60	60	6
Queue Length 95th (ft)	m11	m202	m0	121	m0	183	93	93	18
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	4162	1583	3176	1583	730	791	791	813
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.42	0.16	0.33	0.21	0.38	0.17	0.17	0.02

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	282	1179	571	123	953	221	465	214	107	242	165
v/c Ratio	0.51	1.01	0.63	0.56	0.65	0.69	0.71	0.44	0.44	0.48	0.44
Control Delay	27.4	54.4	10.4	46.1	27.7	42.1	36.3	7.4	35.9	33.6	8.8
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	54.4	10.8	46.1	27.7	42.1	36.3	7.4	35.9	33.6	8.8
Queue Length 50th (ft)	70	~386	116	56	146	112	117	0	54	62	0
Queue Length 95th (ft)	106	#504	279	#152	#234	#196	170	53	98	91	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1166	905	218	1472	342	707	505	342	720	466
Starvation Cap Reductn	0	0	76	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.01	0.69	0.56	0.65	0.65	0.66	0.42	0.31	0.34	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	574	121	537	98	336	536	106	87	343	212
v/c Ratio	0.76	0.70	0.78	0.69	0.23	0.92	0.74	0.16	0.51	0.74	0.38
Control Delay	63.8	24.8	65.4	29.3	6.8	61.6	28.2	4.6	40.4	35.5	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	24.8	65.4	29.3	6.8	61.6	28.2	4.6	40.4	35.5	5.9
Queue Length 50th (ft)	51	95	52	108	0	141	204	0	36	135	0
Queue Length 95th (ft)	#135	146	#138	157	33	#294	#375	29	78	#256	48
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	156	896	156	859	459	364	721	677	177	465	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.64	0.78	0.63	0.21	0.92	0.74	0.16	0.49	0.74	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	↗	→	↖	←	↗	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	587	56	698	262	51	89	396	115
v/c Ratio	0.47	0.39	0.47	0.49	0.36	0.43	0.44	0.80	0.19
Control Delay	48.8	21.8	40.4	14.4	3.0	52.2	21.4	41.7	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	21.8	40.4	14.4	3.0	52.2	21.4	41.7	7.3
Queue Length 50th (ft)	44	122	33	56	2	28	13	210	12
Queue Length 95th (ft)	#118	212	#76	272	12	65	55	273	40
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	176	1520	118	1420	731	118	366	578	765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.39	0.47	0.49	0.36	0.43	0.24	0.69	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	↘	↖	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	723	300	104	807	649	192
v/c Ratio	0.49	0.40	0.40	0.39	0.59	0.30
Control Delay	16.0	8.8	47.6	17.3	28.1	5.6
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	8.8	47.6	17.3	28.1	5.6
Queue Length 50th (ft)	205	102	59	188	157	4
Queue Length 95th (ft)	134	m67	m99	242	213	50
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	753	295	2084	1106	633
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	78	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.40	0.35	0.39	0.59	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

Existing Conditions
PM PEAK

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1372	574	338	209
v/c Ratio	0.58	0.24	0.78	0.50
Control Delay	7.6	7.1	43.6	26.5
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	7.7	7.1	43.6	26.5
Queue Length 50th (ft)	192	59	181	83
Queue Length 95th (ft)	246	110	244	132
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)				275
Base Capacity (vph)	2355	2355	629	588
Starvation Cap Reductn	188	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.24	0.54	0.36
Intersection Summary				

**NEAR-TERM 2008 No ACTION
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	8	14	106	13	97	12	758	62	75	514	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	112	14	102	13	798	65	79	541	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1582	1589	543	1574	1558	831	544			863		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1582	1589	543	1574	1558	831	544			863		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	91	97	0	86	72	99			90		
cM capacity (veh/h)	52	96	540	74	100	370	1025			779		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	227	13	863	79	544						
Volume Left	0	112	13	0	79	0						
Volume Right	15	102	0	65	0	3						
cSH	201	120	1025	1700	779	1700						
Volume to Capacity	0.12	1.90	0.01	0.51	0.10	0.32						
Queue Length 95th (ft)	10	454	1	0	8	0						
Control Delay (s)	25.3	495.5	8.6	0.0	10.1	0.0						
Lane LOS	D	F	A		B							
Approach Delay (s)	25.3	495.5	0.1		1.3							
Approach LOS	D	F										
Intersection Summary												
Average Delay		65.3										
Intersection Capacity Utilization		71.0%		ICU Level of Service		C						
Analysis Period (min)		15										

















2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	10	131	10	10	201	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	11	11	212	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	222			148			418	407	143	418	407	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			148			418	407	143	418	407	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	98	98	99
cM capacity (veh/h)	1347			1433			524	525	904	525	525	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	159	233	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1347	1433	610	597								
Volume to Capacity	0.01	0.01	0.05	0.05								
Queue Length 95th (ft)	1	1	4	4								
Control Delay (s)	0.6	0.4	11.2	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.6	0.4	11.2	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay		2.0										
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

















3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Volume (veh/h)	10	131	10	10	200	20	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	11	11	211	21	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232			148			422	417	143	422	412	221
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			148			422	417	143	422	412	221
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	98	98	99
cM capacity (veh/h)	1336			1433			521	519	904	521	522	819
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	159	242	32	32								
Volume Left	11	11	11	11								
Volume Right	11	21	11	11								
cSH	1336	1433	606	593								
Volume to Capacity	0.01	0.01	0.05	0.05								
Queue Length 95th (ft)	1	1	4	4								
Control Delay (s)	0.6	0.4	11.3	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.6	0.4	11.3	11.4								
Approach LOS				B	B							
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	24.6%			ICU Level of Service					A			
Analysis Period (min)	15											

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Volume (veh/h)	10	130	10	10	200	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	137	11	11	211	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	221			147			416	405	142	416	405	216
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	221			147			416	405	142	416	405	216
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	98	98	99
cM capacity (veh/h)	1348			1434			526	527	906	526	527	824
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	158	232	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1348	1434	612	599								
Volume to Capacity	0.01	0.01	0.05	0.05								
Queue Length 95th (ft)	1	1	4	4								
Control Delay (s)	0.6	0.4	11.2	11.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.6	0.4	11.2	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay	2.0											
Intersection Capacity Utilization	24.0%			ICU Level of Service			A					
Analysis Period (min)	15											

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	60	13	77	116	159	99	35	6	266	112	21	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	14	81	122	167	104	37	6	280	118	22	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	272			95			670	696	54	927	685	219
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272			95			670	696	54	927	685	219
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			92			88	98	72	26	93	98
cM capacity (veh/h)	1292			1499			312	319	1013	160	324	820
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	158	394	323	155								
Volume Left	63	122	37	118								
Volume Right	81	104	280	15								
cSH	1292	1499	780	188								
Volume to Capacity	0.05	0.08	0.41	0.82								
Queue Length 95th (ft)	4	7	51	145								
Control Delay (s)	3.4	2.9	12.8	77.4								
Lane LOS	A	A	B	F								
Approach Delay (s)	3.4	2.9	12.8	77.4								
Approach LOS			B	F								
Intersection Summary												
Average Delay			17.3									
Intersection Capacity Utilization		61.7%		ICU Level of Service		B						
Analysis Period (min)		15										






















6: Wilfred Ave &
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	52	191	148	187	247	89	80	45	222	88	13	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	55	201	156	197	260	94	84	47	234	93	14	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)				630								
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	354			357			1145	1136	279	1346	1167	307
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			357			1160	1150	279	1382	1184	235
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			84			26	67	69	0	90	93
cM capacity (veh/h)	1156			1202			114	143	760	48	137	729
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	412	551	365	156								
Volume Left	55	197	84	93								
Volume Right	156	94	234	49								
cSH	1156	1202	265	75								
Volume to Capacity	0.05	0.16	1.38	2.09								
Queue Length 95th (ft)	4	15	489	356								
Control Delay (s)	1.5	4.2	229.1	623.3								
Lane LOS	A	A	F	F								
Approach Delay (s)	1.5	4.2	229.1	623.3								
Approach LOS			F	F								
Intersection Summary												
Average Delay			123.9									
Intersection Capacity Utilization		81.4%		ICU Level of Service		D						
Analysis Period (min)		15										































7: Wilfred Ave & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1763		1681	1770	1583	1770	3539	1583	3433	1742	
Flt Permitted		0.99		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1763		1681	1770	1583	1770	3539	1583	3433	1742	
Volume (vph)	94	240	166	181	219	540	204	155	265	451	131	100
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	253	175	191	231	568	215	163	279	475	138	105
RTOR Reduction (vph)	0	11	0	0	0	376	0	0	256	0	17	0
Lane Group Flow (vph)	0	516	0	191	231	192	215	163	23	475	226	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		47.3		53.7	53.7	53.7	19.5	12.7	12.7	28.3	21.5	
Effective Green, g (s)		47.8		54.2	54.2	54.2	20.0	13.2	13.2	28.8	22.0	
Actuated g/C Ratio		0.30		0.34	0.34	0.34	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		527		569	600	536	221	292	131	618	240	
v/s Ratio Prot		c0.29		0.11	c0.13		c0.12	0.05		0.14	c0.13	
v/s Ratio Perm						0.12			0.01			
v/c Ratio		0.98		0.34	0.39	0.36	0.97	0.56	0.18	0.77	0.94	
Uniform Delay, d1		55.6		39.5	40.2	39.8	69.7	70.6	68.3	62.4	68.4	
Progression Factor		1.00		0.92	0.92	2.03	1.00	1.00	1.00	0.96	0.96	
Incremental Delay, d2		33.4		1.4	1.7	1.7	52.5	2.3	0.6	5.7	41.8	
Delay (s)		89.0		37.6	38.5	82.4	122.2	72.9	69.0	65.7	107.4	
Level of Service		F		D	D	F	F	E	E	E	F	
Approach Delay (s)		89.0			63.5			87.4			79.8	
Approach LOS		F			E			F			E	
Intersection Summary												
HCM Average Control Delay	77.6			HCM Level of Service					E			
HCM Volume to Capacity ratio	0.75											
Actuated Cycle Length (s)	160.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	77.1%			ICU Level of Service					D			
Analysis Period (min)	15											
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00		
Flt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00		1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00		1.00		
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527		1770		
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00		1.00		
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527		1770		
Volume (vph)	5	30	140	5	95	95	164	150	5	30	200	5			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	158	5	32	211	5			
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	2	0			
Lane Group Flow (vph)	5	32	17	5	111	0	173	158	3	32	214	0			
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot					
Protected Phases	7	4			3	8		5	2		1	6			
Permitted Phases				4						2					
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		13.9	48.9	48.9	3.3	38.3				
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		14.4	49.4	49.4	3.8	38.8				
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.18	0.62	0.62	0.05	0.48				
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	40	210	178	40	368		319	2185	978	84	1711				
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.04		0.02	c0.06				
v/s Ratio Perm			0.01						0.00						
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.54	0.07	0.00	0.38	0.13				
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		29.8	6.1	5.9	37.0	11.3				
Progression Factor	1.00	1.00	1.00	0.85	1.36		1.04	0.86	0.78	1.00	1.00				
Incremental Delay, d2	1.4	0.3	0.2	1.3	0.4		1.4	0.0	0.0	2.9	0.2				
Delay (s)	39.7	32.4	32.1	33.7	44.9		32.4	5.3	4.6	39.8	11.4				
Level of Service	D	C	C	C	D		C	A	A	D	B				
Approach Delay (s)		32.3			44.7			19.3			15.1				
Approach LOS		C			D			B			B				
Intersection Summary															
HCM Average Control Delay	26.0			HCM Level of Service				C							
HCM Volume to Capacity ratio	0.24														
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0							
Intersection Capacity Utilization	30.5%			ICU Level of Service				A							
Analysis Period (min)	15														
c Critical Lane Group															





























9: Wilfred Ave & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↓	↓↑	↓
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3092	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3092	
Volume (vph)	0	737	219	89	476	0	0	0	0	328	324	459
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	776	231	94	501	0	0	0	0	345	341	483
RTOR Reduction (vph)	0	0	124	0	0	0	0	0	0	0	238	0
Lane Group Flow (vph)	0	776	107	94	501	0	0	0	0	345	586	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8				6		
Permitted Phases		4						6				
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	1005	
v/s Ratio Prot		c0.22		c0.03		0.14						
v/s Ratio Perm		0.07								c0.21	0.19	
v/c Ratio		0.47	0.15	0.45	0.25					0.66	0.58	
Uniform Delay, d1		14.7	12.3	36.2	8.4					23.2	22.5	
Progression Factor		1.27	3.97	0.99	0.84					1.00	1.00	
Incremental Delay, d2		0.5	0.2	1.4	0.3					6.4	2.5	
Delay (s)		19.3	49.2	37.4	7.3					29.6	25.0	
Level of Service		B	D	D	A					C	C	
Approach Delay (s)		26.1		12.1		0.0				26.3		
Approach LOS		C		B		A				C		
Intersection Summary												
HCM Average Control Delay		23.2		HCM Level of Service				C				
HCM Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		55.9%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												












10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3405		1681	1738	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3405		1681	1738	2787	1770	1814	
Volume (vph)	0	558	507	413	344	117	222	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	587	534	435	362	123	234	114	599	44	43	9
RTOR Reduction (vph)	0	0	414	0	34	0	0	0	475	0	7	0
Lane Group Flow (vph)	0	587	120	435	451	0	170	178	124	44	45	0
Turn Type	Prot	Perm		Prot			Split	Perm		Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4						2					
Actuated Green, G (s)	17.5	17.5	12.5	34.5			16.0	16.0	16.0	16.0		
Effective Green, g (s)	18.0	18.0	13.0	35.0			16.5	16.5	16.5	16.5		
Actuated g/C Ratio	0.22	0.22	0.16	0.44			0.21	0.21	0.21	0.21		
Clearance Time (s)	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1144	356	558	1490			347	358	575	365	374	
v/s Ratio Prot	c0.12		c0.13		0.13		0.10		c0.10		c0.02	
v/s Ratio Perm	0.08									0.04		
v/c Ratio	0.51	0.34	0.78	0.30			0.49	0.50	0.21	0.12	0.12	
Uniform Delay, d1	27.2	26.0	32.1	14.6			28.0	28.1	26.4	25.8	25.8	
Progression Factor	1.45	9.38	1.18	1.22			0.87	0.86	1.58	0.86	0.84	
Incremental Delay, d2	1.4	2.2	6.3	0.5			4.6	4.5	0.8	0.7	0.7	
Delay (s)	40.7	246.1	44.2	18.3			28.8	28.8	42.4	22.9	22.3	
Level of Service	D		F		D		C		C		C	
Approach Delay (s)	138.6			30.5			37.4			22.6		
Approach LOS	F			C			D			C		
Intersection Summary												
HCM Average Control Delay	71.7			HCM Level of Service					E			
HCM Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	56.5%			ICU Level of Service					B			
Analysis Period (min)	15											
c Critical Lane Group												
























11: Wilfred Ave & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	970	637	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1021	671	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1021	702	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	9.9	50.5	36.1		20.5	20.5
Effective Green, g (s)	10.4	51.0	36.6		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	446	2256	1607		465	416
v/s Ratio Prot	0.06	c0.29	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.46	0.45	0.44		0.21	0.16
Uniform Delay, d1	32.2	7.4	14.7		23.0	22.7
Progression Factor	0.94	2.06	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	0.9		1.0	0.8
Delay (s)	30.8	15.8	15.6		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)	18.3	15.6			23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		18.3		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.38				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		39.9%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1687	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	387	3	40	8	3	5	514	489	2	7	435	512
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	407	3	42	8	3	5	541	515	2	7	458	539
RTOR Reduction (vph)	0	0	34	0	5	0	0	0	0	0	0	409
Lane Group Flow (vph)	204	206	8	0	11	0	541	517	0	7	458	130
Turn Type	Split		Perm		Split		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	14.6	14.6	14.6		1.5		27.1	44.4		1.5	18.8	18.8
Effective Green, g (s)	15.1	15.1	15.1		2.0		27.6	44.9		2.0	19.3	19.3
Actuated g/C Ratio	0.19	0.19	0.19		0.02		0.35	0.56		0.02	0.24	0.24
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	317	318	299		44		611	1985		44	854	382
v/s Ratio Prot	0.12	c0.12			c0.01		c0.31	0.15		0.00	c0.13	
v/s Ratio Perm			0.01									0.08
v/c Ratio	0.64	0.65	0.03		0.25		0.89	0.26		0.16	0.54	0.34
Uniform Delay, d1	30.0	30.0	26.5		38.3		24.7	9.0		38.2	26.5	25.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.31	1.17	4.44
Incremental Delay, d2	4.4	4.5	0.0		3.0		14.4	0.3		1.2	1.7	1.7
Delay (s)	34.4	34.5	26.5		41.3		39.1	9.3		51.1	32.6	113.2
Level of Service	C	C	C		D		D	A		D	C	F
Approach Delay (s)	33.7				41.3		24.6				76.0	
Approach LOS		C			D			C				E
Intersection Summary												
HCM Average Control Delay		46.7		HCM Level of Service	D							
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	16.0							
Intersection Capacity Utilization		73.5%		ICU Level of Service	D							
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	832	0	0	634
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	876	0	0	667
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1543	876			876	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1543	876			876	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	126	348			771	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	876	667			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.52	0.39			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		47.1%		ICU Level of Service	A	
Analysis Period (min)		15				













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6			0.0
Approach LOS	D					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization		37.7%		ICU Level of Service	A	
Analysis Period (min)		15				

























16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	286	546	251	212	421
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	301	575	264	223	443
RTOR Reduction (vph)	0	235	0	150	0	0
Lane Group Flow (vph)	271	66	575	114	223	443
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.7	26.7	9.4	40.6
Effective Green, g (s)	13.8	13.8	27.2	27.2	9.9	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	806	685	279	1217
v/s Ratio Prot	c0.15		c0.31		c0.13	
v/s Ratio Perm	0.04		0.07			
v/c Ratio	0.70	0.19	0.71	0.17	0.80	0.36
Uniform Delay, d1	22.6	20.0	14.7	10.9	25.5	5.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.3	5.3	0.5	14.7	0.8
Delay (s)	28.0	20.3	20.0	11.4	40.3	5.8
Level of Service	C	C	B	B	D	A
Approach Delay (s)	24.0		17.3		17.3	
Approach LOS	C		B		B	
Intersection Summary						
HCM Average Control Delay	19.1		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.73					
Actuated Cycle Length (s)	62.9		Sum of lost time (s)		12.0	
Intersection Capacity Utilization	64.7%		ICU Level of Service		C	
Analysis Period (min)	15					
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	600	36	202	575	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	120	0	63	69	0	59	0
Lane Group Flow (vph)	53	632	9	213	605	42	67	34	16	284	90	0
Turn Type	Prot		Perm		Prot		Perm		Prot		Prot	
Protected Phases	7		4		3		8		5		2	
Permitted Phases			4				8				2	
Actuated Green, G (s)	3.3	18.0	18.0	5.5	20.2	20.2	4.4	14.1	14.1	24.4	34.1	
Effective Green, g (s)	3.8	18.5	18.5	6.0	20.7	20.7	4.9	14.6	14.6	24.9	34.6	
Actuated g/C Ratio	0.05	0.23	0.23	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	257	916	410	210	285	274	551	721	
v/s Ratio Prot	0.03	c0.18		c0.06	0.17		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.77	0.02	0.83	0.66	0.10	0.32	0.12	0.06	0.52	0.12	
Uniform Delay, d1	37.4	28.8	23.8	36.5	26.5	22.6	36.0	27.3	27.0	22.6	13.6	
Progression Factor	1.00	1.00	1.00	0.80	0.56	0.27	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	16.3	1.5	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	33.3	23.8	45.5	16.4	6.1	36.8	28.2	27.4	23.4	14.0	
Level of Service	D	C	C	D	B	A	D	C	C	C	B	
Approach Delay (s)	34.2		21.0		30.2		20.2		20.2			
Approach LOS	C		C		C		C		C			
Intersection Summary												
HCM Average Control Delay	25.8			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	54.8%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	701	146	371	656	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	738	154	391	691	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	255	0	117	227	0	0	206
Lane Group Flow (vph)	245	738	51	391	691	122	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.15		c0.11	c0.20		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.88	0.44	0.10	0.76	0.60	0.24	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	20.9	18.5	32.6	22.7	19.8	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.76	0.54	0.46	0.79	0.69	1.06	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.5	0.6	0.3	5.4	2.0	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	45.6	12.0	8.7	31.2	17.8	21.9	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	B	C	D	C	C	D	D	C
Approach Delay (s)		18.8			22.4			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		66.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												





















19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00				1.00	0.95	0.95
Frt		0.97		1.00	1.00	0.85				0.90	1.00	1.00
Flt Protected		1.00		0.95	1.00	1.00				0.99	0.95	0.95
Satd. Flow (prot)		4942		1770	3539	1583				1658	1681	1686
Flt Permitted		1.00		0.95	1.00	1.00				0.91	0.74	0.71
Satd. Flow (perm)		4942		1770	3539	1583				1529	1311	1254
Volume (vph)	0	1208	278	68	1024	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1272	293	72	1078	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	44	0	0	0	0	0	12	0	0	0	50
Lane Group Flow (vph)	0	1521	0	72	1078	209	0	13	0	370	370	319
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free	2				6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2218		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.31		0.04	c0.30							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.20
v/c Ratio		0.69		0.62	0.54	0.13		0.03		0.84	0.88	0.60
Uniform Delay, d1		17.6		36.4	10.9	0.0		17.8		24.6	25.1	22.2
Progression Factor		0.44		1.09	0.85	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.5		8.4	0.9	0.2		0.0		13.7	18.9	1.9
Delay (s)		9.1		47.9	10.2	0.2		17.9		38.4	44.0	24.1
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.1			10.7			17.9			35.5	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.9			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		69.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												





















20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	0.98
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	0.96
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	1748
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.81	0.81
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1476	1476
Volume (vph)	17	1631	273	0	985	350	303	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1717	287	0	1037	368	319	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1717	287	0	1037	368	319	160	160	0	16	0
Turn Type	Prot		Free			Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases			Free			Free	2		2		6	
Actuated Green, G (s)	2.2	48.9	80.0		42.2	80.0	22.1	22.1	22.1		22.1	
Effective Green, g (s)	2.7	49.4	80.0		42.7	80.0	22.6	22.6	22.6		22.6	
Actuated g/C Ratio	0.03	0.62	1.00		0.53	1.00	0.28	0.28	0.28		0.28	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3957	1583		2714	1583	392	425	425		417	
v/s Ratio Prot	0.01	c0.27			0.20			0.11				
v/s Ratio Perm			0.18			0.23	c0.23		0.11		0.01	
v/c Ratio	0.30	0.43	0.18		0.38	0.23	0.81	0.38	0.38		0.04	
Uniform Delay, d1	37.7	8.0	0.0		10.9	0.0	26.7	23.0	23.0		20.8	
Progression Factor	1.08	1.10	1.00		0.62	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.8	0.2	0.2		0.3	0.3	12.2	0.6	0.6		0.0	
Delay (s)	42.5	9.0	0.2		7.1	0.3	38.9	23.6	23.6		20.9	
Level of Service	D	A	A		A	A	D	C	C		C	
Approach Delay (s)		8.1			5.3			31.2			20.9	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM Average Control Delay	10.8			HCM Level of Service				B				
HCM Volume to Capacity ratio	0.55											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				8.0				
Intersection Capacity Utilization	49.6%			ICU Level of Service				A				
Analysis Period (min)	15											
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4948		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4948		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1138	545	141	771	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1198	574	148	812	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	40	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1198	179	148	951	0	226	475	47	107	242	29
Turn Type	Prot	Perm		Prot	Split			Perm	Split		Perm	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases		4							2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.34		0.08	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	1.08	0.36	0.60	0.67		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.0		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.75	0.77	2.73	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	51.6	1.9	4.1	2.5		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	23.8	72.9	60.0	36.5	27.5		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	C	E	E	D	C		D	C	C	C	C	C
Approach Delay (s)		62.5		28.7			32.7			31.1		
Approach LOS		E		C			C			C		
Intersection Summary												
HCM Average Control Delay	44.6			HCM Level of Service				D				
HCM Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	71.6%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

	↖	→	↗	↖	←	↖	↖	↑	↗	↗	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	103	321	494	108	96	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	108	338	520	114	101	360	231
RTOR Reduction (vph)	0	67	0	0	83	0	0	71	0	0	172	
Lane Group Flow (vph)	140	655	0	135	620	25	338	520	43	101	360	59
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	25.8	25.8	5.2	17.5	17.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	26.3	26.3	5.7	18.0	18.0
Actuated g/C Ratio	0.09	0.23		0.09	0.23	0.23	0.20	0.37	0.37	0.08	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	151	784		151	821	367	352	697	592	144	477	405
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.06	0.19	
v/s Ratio Perm					0.02			0.03			0.04	
v/c Ratio	0.93	0.84		0.89	0.76	0.07	0.96	0.75	0.07	0.70	0.75	0.15
Uniform Delay, d1	31.9	25.7		31.8	25.1	21.1	27.9	19.1	14.2	31.5	24.1	20.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	51.5	7.7		43.4	4.0	0.1	37.4	7.1	0.2	14.3	10.6	0.8
Delay (s)	83.4	33.4		75.2	29.1	21.2	65.3	26.2	14.4	45.8	34.7	21.0
Level of Service	F	C		E	C	C	E	C	B	D	C	C
Approach Delay (s)		41.5			35.3			38.4			31.7	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay		37.1			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		70.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												














23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

	↖	→	↗	↖	←	↖	↖	↑	↗	↗	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.85	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3513		1770	3539	1583	1770	1660	1583	1770	1649	1583
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3513		1770	3539	1583	1770	1660	1583	1770	1649	1583
Volume (vph)	102	625	32	53	738	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	658	34	56	777	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	4	0	0	139	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	688	0	56	777	212	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				6
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1124		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.20		0.03	c0.22		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.13							
v/c Ratio	0.67	0.61		0.58	0.77	0.47	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	25.9		41.6	29.5	26.6	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.67	0.58	0.22	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	2.5		8.0	5.3	3.2	22.4	1.0		5.7	0.1	
Delay (s)	50.4	28.4		35.9	22.4	9.1	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		31.3			19.1		49.1				27.8	
Approach LOS		C			B		D				C	
Intersection Summary												
HCM Average Control Delay		26.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		71.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↑	↓	↑↑					↓	↑	↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0		
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00		
Frt		1.00	0.85	1.00	1.00					1.00	0.85		
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00		
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583		
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00		
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583		
Volume (vph)	0	819	361	99	900	0	0	0	0	639	0	212	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	380	104	947	0	0	0	0	673	0	223	
RTOR Reduction (vph)	0	0	95	0	0	0	0	0	0	0	89	0	
Lane Group Flow (vph)	0	862	285	104	947	0	0	0	0	673	134	0	0
Turn Type		Perm		Prot						Prot			
Protected Phases		4		3		8				1		6	
Permitted Phases		4											
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5		
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0		
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32		
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5		
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0		
Lane Grp Cap (vph)		1451	649	238	2084					1106	510		
v/s Ratio Prot		c0.24		0.06		c0.27				c0.20	0.08		
v/s Ratio Perm		0.18											
v/c Ratio		0.59	0.44	0.44	0.45					0.61	0.26		
Uniform Delay, d1		20.7	19.1	35.8	10.4					25.7	22.6		
Progression Factor		0.60	0.54	1.33	1.85					1.00	1.00		
Incremental Delay, d2		1.4	1.6	1.2	0.7					1.0	1.3		
Delay (s)		13.7	11.9	48.8	19.9					26.7	23.8		
Level of Service		B		D		B				C		C	
Approach Delay (s)		13.1		22.8				0.0		26.0			
Approach LOS		B		C				A		C			
Intersection Summary													
HCM Average Control Delay		19.9		HCM Level of Service				B					
HCM Volume to Capacity ratio		0.56											
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0							
Intersection Capacity Utilization		61.7%		ICU Level of Service		B							
Analysis Period (min)		15											
c Critical Lane Group													

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	351	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	369	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	369	227
Turn Type				Perm		
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	63.2			63.2	17.8	17.8
Effective Green, g (s)	63.7			63.7	18.3	18.3
Actuated g/C Ratio	0.71			0.71	0.20	0.20
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2505			2505	698	322
v/s Ratio Prot	c0.43			0.18	0.11	
v/s Ratio Perm				c0.14		
v/c Ratio	0.61			0.26	0.53	0.71
Uniform Delay, d1	6.8			4.7	32.0	33.3
Progression Factor	0.53			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	0.7	6.9
Delay (s)	4.5			5.0	32.7	40.2
Level of Service	A			A	C	D
Approach Delay (s)	4.5			5.0	35.7	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			11.5	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			61.7%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

26: Redwood Drive & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	6	11	2	7	194	19	715	20	116	546	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	6	12	2	7	204	20	753	21	122	575	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1343	1635	289	1339	1616	376	579			774		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1343	1635	289	1339	1616	376	579			774		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	92	98	98	91	67	98			85		
cM capacity (veh/h)	61	84	707	90	86	621	991			838		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	214	20	376	376	21	122	383	196			
Volume Left	7	2	20	0	0	0	122	0	0			
Volume Right	12	204	0	0	0	21	0	0	4			
cSH	118	650	991	1700	1700	1700	838	1700	1700			
Volume to Capacity	0.21	0.33	0.02	0.22	0.22	0.01	0.15	0.23	0.12			
Queue Length 95th (ft)	19	36	2	0	0	0	13	0	0			
Control Delay (s)	43.5	15.3	8.7	0.0	0.0	0.0	10.0	0.0	0.0			
Lane LOS	E	C	A				B					
Approach Delay (s)	43.5	15.3	0.2				1.7					
Approach LOS	E	C										
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			45.1%			ICU Level of Service			A			
Analysis Period (min)			15									













27: Redwood Drive & Primrose Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	0	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	0	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	1	1								
Volume Left	1	4	0	0								
Volume Right	3	2	1	0								
cSH	1359	1432	899	557								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.2	9.0	11.5								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.1	0.2	9.0	11.5								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			23.3%			ICU Level of Service			A			
Analysis Period (min)			15									










28: Redwood Drive & Whistler Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕											
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization	24.0%		ICU Level of Service			A						
Analysis Period (min)			15									













29: Redwood Drive & Langner Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	  					
Sign Control	Free			Free	Stop	
Grade	0%		0%		0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			27.4%		ICU Level of Service A	
Analysis Period (min)			15			

30: Redwood Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization	32.1%		ICU Level of Service					A				
Analysis Period (min)			15									

31: Redwood Drive &
Graton Rancheria Casino & Hotel

2008
PM Peak

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165			154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165			154
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			100			100
cM capacity (veh/h)			1413			892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			22.4%		ICU Level of Service A	
Analysis Period (min)			15			

7: Wilfred Ave & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

	→	↘	←	↙	↖	↑	↗	↘	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	527	191	231	568	215	163	279	475	243
v/c Ratio	0.98	0.34	0.39	0.62	0.97	0.56	0.72	0.77	0.95
Control Delay	87.1	38.1	39.1	8.7	122.0	77.8	18.3	69.2	103.3
Queue Delay	9.9	4.8	7.3	1.2	0.0	0.0	0.3	1.7	0.0
Total Delay	97.0	42.9	46.4	10.0	122.0	77.8	18.5	70.9	103.3
Queue Length 50th (ft)	536	153	192	85	228	87	0	246	237
Queue Length 95th (ft)	#781	215	262	142	#402	127	95	#350	#420
Internal Link Dist (ft)	550		220			110			270
Turn Bay Length (ft)					150		100	275	
Base Capacity (vph)	540	569	599	912	221	376	418	618	257
Starvation Cap Reductn	0	307	317	163	0	0	0	0	0
Spillback Cap Reductn	22	0	0	0	0	0	10	49	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.73	0.82	0.76	0.97	0.43	0.68	0.83	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

	↘	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	158	5	32	216
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.54	0.06	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	29.0	25.6	35.2	5.3	4.6	35.8	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	29.0	25.6	35.2	5.3	4.6	35.8	11.9
Queue Length 50th (ft)	2	15	0	2	19	90	6	0	15	24
Queue Length 95th (ft)	13	39	49	m6	72	m114	m34	m1	40	63
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	399	2462	1102	184	1871
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.06	0.00	0.17	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Ave & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	776	231	94	501	345	824
v/c Ratio	0.46	0.26	0.37	0.25	0.66	0.66
Control Delay	19.2	6.1	38.8	7.4	30.4	15.8
Queue Delay	2.3	0.6	0.0	0.0	0.0	0.1
Total Delay	21.5	6.7	38.8	7.4	30.4	15.9
Queue Length 50th (ft)	268	94	21	32	161	107
Queue Length 95th (ft)	m342	m110	37	52	261	173
Internal Link Dist (ft)	220		466		348	
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	873	257	2035	523	1243
Starvation Cap Reductn	740	345	0	0	0	0
Spillback Cap Reductn	0	0	0	2	0	40
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.44	0.37	0.25	0.66	0.68
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	587	534	435	485	170	178	599	44	52
v/c Ratio	0.51	0.69	0.78	0.32	0.49	0.50	0.57	0.12	0.14
Control Delay	40.8	23.4	48.2	16.2	29.4	29.4	6.4	23.1	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	23.4	48.2	16.2	29.4	29.4	6.4	23.1	19.0
Queue Length 50th (ft)	155	220	120	105	56	58	0	22	23
Queue Length 95th (ft)	186	268	#181	142	m115	m120	82	41	43
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	770	558	1524	347	358	1050	365	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.69	0.78	0.32	0.49	0.50	0.57	0.12	0.14
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

11: Wilfred Ave & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1021	706	97	248
v/c Ratio	0.46	0.45	0.44	0.21	0.41
Control Delay	32.7	15.9	16.0	24.5	5.8
Queue Delay	0.0	0.5	0.0	0.0	0.0
Total Delay	32.7	16.4	16.0	24.5	5.8
Queue Length 50th (ft)	65	249	120	38	0
Queue Length 95th (ft)	92	274	175	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1610	465	598
Starvation Cap Reductn	0	742	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.67	0.44	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	204	206	42	16	541	517	7	458	539
v/c Ratio	0.65	0.65	0.13	0.11	1.02	0.22	0.05	0.39	0.61
Control Delay	38.9	39.1	9.0	29.3	74.3	8.9	44.0	27.4	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	38.9	39.1	9.0	29.3	74.3	8.9	44.0	27.4	12.2
Queue Length 50th (ft)	100	101	0	5	~278	37	4	128	139
Queue Length 95th (ft)	156	157	23	23	#478	147	m5	#224	162
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2306	177	1175	885
Starvation Cap Reductn	0	0	0	0	0	0	0	0	62
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	0.09	0.09	1.02	0.22	0.04	0.39	0.65
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	301	575	264	223	443
v/c Ratio	0.70	0.52	0.71	0.32	0.80	0.36
Control Delay	32.9	6.5	21.7	3.0	50.2	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	6.5	21.7	3.0	50.2	6.4
Queue Length 50th (ft)	96	0	182	0	86	70
Queue Length 95th (ft)	168	54	#305	38	#194	119
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	617	805	834	281	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.49	0.71	0.32	0.79	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	632	38	213	605	162	67	97	85	284	149
v/c Ratio	0.40	0.86	0.11	0.83	0.66	0.31	0.26	0.24	0.22	0.53	0.18
Control Delay	44.6	43.6	9.9	53.4	19.7	2.6	37.7	11.2	8.0	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	43.6	9.9	53.4	19.7	2.6	37.7	11.2	8.0	27.8	5.7
Queue Length 50th (ft)	26	160	0	37	120	0	16	8	0	118	13
Queue Length 95th (ft)	61	#245	23	m#105	#223	m5	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	915	529	257	398	393	531	833
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.84	0.10	0.83	0.66	0.31	0.26	0.24	0.22	0.53	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	738	154	391	691	377	144	435	274	383	278	256
v/c Ratio	0.88	0.44	0.25	0.76	0.60	0.49	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	52.7	12.1	2.4	35.4	18.2	4.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	12.1	2.4	35.4	18.2	4.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	72	55	4	107	165	38	71	74	0	95	129	0
Queue Length 95th (ft) m#178	m64	m8	#167	200	52	#157	118	65	#188	#230	58	
Internal Link Dist (ft)	320			520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1147	768	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.44	0.25	0.76	0.60	0.49	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1565	72	1078	209	25	370	370	369
v/c Ratio	0.68	0.51	0.54	0.13	0.05	0.84	0.88	0.64
Control Delay	9.0	51.0	10.9	0.2	9.8	43.2	48.5	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	51.0	10.9	0.2	9.8	43.2	48.5	22.7
Queue Length 50th (ft)	135	38	166	0	2	169	172	116
Queue Length 95th (ft)	172	m#64	235	m0	18	#318	#329	205
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2318	142	2000	1583	568	475	455	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.51	0.54	0.13	0.04	0.78	0.81	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1717	287	1037	368	319	161	161	18
v/c Ratio	0.14	0.43	0.18	0.36	0.23	0.81	0.38	0.38	0.04
Control Delay	39.2	10.2	0.2	7.6	0.3	42.1	23.5	23.5	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	10.2	0.2	7.6	0.3	42.1	23.5	23.5	15.1
Queue Length 50th (ft)	10	166	0	73	0	148	67	67	5
Queue Length 95th (ft)	m13	m216	m0	125	m0	201	98	98	17
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3957	1583	2886	1583	730	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.43	0.18	0.36	0.23	0.44	0.20	0.20	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008
PM Peak

	↗	→	↘	↖	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1198	574	148	991	226	475	236	107	242	193
v/c Ratio	0.51	1.08	0.64	0.60	0.67	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	26.4	76.0	10.1	46.8	28.0	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	76.0	10.6	46.8	28.0	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	70	~396	125	69	151	114	120	0	54	62	0
Queue Length 95th (ft)	107	#515	289	#187	#246	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1107	890	246	1471	342	707	522	342	720	488
Starvation Cap Reductn	0	0	77	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.08	0.71	0.60	0.67	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008
PM Peak

	↗	→	↖	←	↗	↖	↑	↗	↖	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	108	338	520	114	101	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.24	0.95	0.74	0.17	0.59	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.5	66.8	28.3	4.4	45.9	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.5	66.8	28.3	4.4	45.9	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	42	146	0
Queue Length 95th (ft)	#162	#221	#155	184	35	#296	#358	30	#100	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	466	357	706	671	173	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.23	0.95	0.74	0.17	0.58	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008
PM Peak

	↗	→	↖	←	↗	↖	↑	↗	↖	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT		
Lane Group Flow (vph)	107	692	56	777	351	51	91	511	132		
v/c Ratio	0.67	0.56	0.47	0.72	0.57	0.43	0.44	0.80	0.18		
Control Delay	64.2	28.7	39.7	22.1	6.4	52.2	21.8	35.9	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.2	28.7	39.7	22.1	6.4	52.2	21.8	35.9	5.8		
Queue Length 50th (ft)	61	186	33	235	10	28	14	237	10		
Queue Length 95th (ft)	#161	255	#75	#325	23	65	57	#388	43		
Internal Link Dist (ft)		6630		350			200		236		
Turn Bay Length (ft)	225		150		80	50		225			
Base Capacity (vph)	159	1233	118	1077	617	118	367	653	782		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.67	0.56	0.47	0.72	0.57	0.43	0.25	0.78	0.17		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	380	104	947	673	223
v/c Ratio	0.58	0.50	0.40	0.45	0.61	0.37
Control Delay	14.2	8.3	49.5	20.2	28.6	11.9
Queue Delay	0.3	0.2	0.0	0.4	0.0	0.0
Total Delay	14.4	8.5	49.5	20.6	28.6	11.9
Queue Length 50th (ft)	130	61	59	225	164	37
Queue Length 95th (ft)	160	m98	111	283	222	95
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	758	295	2084	1106	599
Starvation Cap Reductn	167	61	0	553	0	0
Spillback Cap Reductn	43	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.55	0.35	0.62	0.61	0.37
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	369	248
v/c Ratio	0.61	0.26	0.53	0.72
Control Delay	5.2	5.7	33.8	41.3
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	5.3	5.7	33.8	41.3
Queue Length 50th (ft)	190	58	97	119
Queue Length 95th (ft)	252	112	123	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2505	2505	1221	580
Starvation Cap Reductn	188	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.26	0.30	0.43
Intersection Summary				

**CUMULATIVE 2020 No ACTION
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	16	143	22	134	14	677	74	102	508	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	14	17	151	23	141	15	713	78	107	535	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1575	1571	536	1554	1534	752	538			791		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1575	1571	536	1554	1534	752	538			791		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	86	97	0	77	66	99			87		
cM capacity (veh/h)	43	95	544	71	100	410	1030			830		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	315	15	791	107	538						
Volume Left	0	151	15	0	107	0						
Volume Right	17	141	0	78	0	3						
cSH	174	117	1030	1700	830	1700						
Volume to Capacity	0.18	2.69	0.01	0.47	0.13	0.32						
Queue Length 95th (ft)	15	720	1	0	11	0						
Control Delay (s)	30.0	841.3	8.5	0.0	10.0	0.0						
Lane LOS	D	F	A		A							
Approach Delay (s)	30.0	841.3	0.2		1.7							
Approach LOS	D	F										
Intersection Summary												
Average Delay		148.6										
Intersection Capacity Utilization		71.5%		ICU Level of Service		C						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	170	10	9	280	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	11	9	295	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			189			539	528	184	539	529	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			189			539	528	184	539	529	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	98	98	99
cM capacity (veh/h)	1257			1384			433	449	858	434	448	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	200	314	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	1257	1384	526	510								
Volume to Capacity	0.01	0.01	0.06	0.06								
Queue Length 95th (ft)	1	1	5	5								
Control Delay (s)	0.5	0.3	12.3	12.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.5	0.3	12.3	12.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay		1.7										
Intersection Capacity Utilization		28.2%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	170	10	9	280	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	11	9	295	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			189			539	528	184	539	529	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			189			539	528	184	539	529	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	98	98	99
cM capacity (veh/h)	1257			1384			433	449	858	434	448	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	200	314	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	1257	1384	526	510								
Volume to Capacity	0.01	0.01	0.06	0.06								
Queue Length 95th (ft)	1	1	5	5								
Control Delay (s)	0.5	0.3	12.3	12.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.5	0.3	12.3	12.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay		1.7										
Intersection Capacity Utilization		28.2%			ICU Level of Service		A					
Analysis Period (min)		15										


















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	170	10	9	280	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	11	9	295	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			189			535	528	184	535	524	295
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			189			535	528	184	535	524	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	99	98	98	99
cM capacity (veh/h)	1257			1384			437	449	858	438	451	745
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	200	9	295	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	1257	1384	1700	1700	528	513						
Volume to Capacity	0.01	0.01	0.17	0.01	0.06	0.06						
Queue Length 95th (ft)	1	1	0	0	5	5						
Control Delay (s)	0.5	7.6	0.0	0.0	12.3	12.5						
Lane LOS	A	A			B	B						
Approach Delay (s)	0.5	0.2			12.3	12.5						
Approach LOS					B	B						
Intersection Summary												
Average Delay		1.6										
Intersection Capacity Utilization		27.8%			ICU Level of Service		A					
Analysis Period (min)		15										


















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	40	109	41	188	245	189	44	14	396	180	31	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	115	43	198	258	199	46	15	417	189	33	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	457			158			773	1073	79	1319	995	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	457			158			773	1073	79	1319	995	228
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			86			79	92	57	0	84	99
cM capacity (veh/h)	1100			1419			217	181	966	53	201	774
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	42	76	81	198	172	285	478	234				
Volume Left	42	0	0	198	0	0	46	189				
Volume Right	0	0	43	0	0	199	417	12				
cSH	1100	1700	1700	1419	1700	1700	658	63				
Volume to Capacity	0.04	0.04	0.05	0.14	0.10	0.17	0.73	3.74				
Queue Length 95th (ft)	3	0	0	12	0	0	156	Err				
Control Delay (s)	8.4	0.0	0.0	7.9	0.0	0.0	23.6	Err				
Lane LOS	A			A			C	F				
Approach Delay (s)	1.8			2.4			23.6	Err				
Approach LOS							C	F				
Intersection Summary												
Average Delay	1500.2											
Intersection Capacity Utilization	69.4%			ICU Level of Service			C					
Analysis Period (min)	15											

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop			Stop	
Grade	0%			0%			0%			0%		
Volume (veh/h)	53	359	273	509	360	273	143	105	559	217	41	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	378	287	536	379	287	151	111	588	228	43	125
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)	630											
pX, platoon unblocked												
vC, conflicting volume	666			665			2041	2371	333	2538	2371	333
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	666			665			2041	2371	333	2538	2371	333
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			42			0	0	11	0	0	81
cM capacity (veh/h)	919			920			0	13	663	0	13	663
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	56	252	413	536	253	414	849	397				
Volume Left	56	0	0	536	0	0	151	228				
Volume Right	0	0	287	0	0	287	588	125				
cSH	919	1700	1700	920	1700	1700	0	0				
Volume to Capacity	0.06	0.15	0.24	0.58	0.15	0.24	Err	Err				
Queue Length 95th (ft)	5	0	0	97	0	0	Err	Err				
Control Delay (s)	9.2	0.0	0.0	14.2	0.0	0.0	Err	Err				
Lane LOS	A			B			F	F				
Approach Delay (s)	0.7			6.3			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	112.3%			ICU Level of Service			H					
Analysis Period (min)	15											

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1650	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1650	
Volume (vph)	146	734	255	73	364	730	556	103	350	453	70	222
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	154	773	268	77	383	768	585	108	368	477	74	234
RTOR Reduction (vph)	0	0	104	0	0	405	0	0	342	0	71	0
Lane Group Flow (vph)	154	773	164	77	383	363	585	108	26	477	237	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	
Protected Phases	4	4		8	8	5	2		1	6		
Permitted Phases		4			8		2					
Actuated Green, G (s)	42.2	42.2	42.2	58.8	58.8	58.8	19.5	10.9	10.9	30.1	21.5	
Effective Green, g (s)	42.7	42.7	42.7	59.3	59.3	59.3	20.0	11.4	11.4	30.6	22.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.37	0.37	0.37	0.12	0.07	0.07	0.19	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	472	905	385	623	656	587	221	252	113	657	227	
v/s Ratio Prot	0.09	c0.23		0.05	0.22		c0.33	0.03		0.14	c0.14	
v/s Ratio Perm			0.11			c0.23		0.02				
v/c Ratio	0.33	0.85	0.43	0.12	0.58	0.62	2.65	0.43	0.23	0.73	1.05	
Uniform Delay, d1	47.1	55.7	48.5	33.2	40.4	41.1	70.0	71.2	70.2	60.8	69.0	
Progression Factor	1.00	1.00	1.00	0.87	0.87	1.41	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	7.9	0.8	0.4	3.3	4.3	754.0	1.2	1.1	4.0	72.1	
Delay (s)	47.5	63.6	49.3	29.3	38.6	62.4	824.0	72.4	71.2	64.8	141.1	
Level of Service	D	E	D	C	D	E	F	E	E	E	F	
Approach Delay (s)		58.3			52.9			486.4			94.7	
Approach LOS		E			D			F			F	
Intersection Summary												
HCM Average Control Delay		169.9									F	
HCM Volume to Capacity ratio		1.03										
Actuated Cycle Length (s)		160.0							16.0			
Intersection Capacity Utilization		103.6%							G			
Analysis Period (min)		15										
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.91	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3072	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3072	
Volume (vph)	0	1257	283	77	682	0	0	0	0	355	288	482
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1323	298	81	718	0	0	0	0	374	303	507
RTOR Reduction (vph)	0	0	160	0	0	0	0	0	0	0	144	0
Lane Group Flow (vph)	0	1323	138	81	718	0	0	0	0	374	666	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases		4										
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	998	
v/s Ratio Prot		c0.37		0.02	c0.20							
v/s Ratio Perm			0.09							c0.23	0.22	
v/c Ratio		0.81	0.19	0.39	0.35					0.72	0.67	
Uniform Delay, d1		18.4	12.6	36.1	9.1					23.7	23.3	
Progression Factor		1.53	3.53	1.01	0.86					1.00	1.00	
Incremental Delay, d2		2.5	0.3	1.1	0.5					8.1	3.5	
Delay (s)		30.6	44.8	37.7	8.2					31.9	26.8	
Level of Service		C	D	D	A					C	C	
Approach Delay (s)		33.2			11.2				0.0		28.4	
Approach LOS		C			B				A		C	
Intersection Summary												
HCM Average Control Delay		26.8								C		
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0								8.0		
Intersection Capacity Utilization		63.9%								B		
Analysis Period (min)		15										
c Critical Lane Group												













10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3519		1681	1694	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3519		1681	1694	2787	1770	1723	
Volume (vph)	0	759	854	499	443	17	319	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	799	899	525	466	18	336	19	601	9	9	9
RTOR Reduction (vph)	0	0	594	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	799	305	525	481	0	173	182	124	9	11	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)		17.5	17.5	12.5	34.5		16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)		18.0	18.0	13.0	35.0		16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio		0.22	0.22	0.16	0.44		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1144	356	558	1540		347	349	575	365	355	
v/s Ratio Prot		0.16		c0.15	0.14		0.10	c0.11		0.01	c0.01	
v/s Ratio Perm			c0.19						0.04			
v/c Ratio		0.70	0.86	0.94	0.31		0.50	0.52	0.22	0.02	0.03	
Uniform Delay, d1		28.5	29.8	33.1	14.7		28.1	28.2	26.4	25.3	25.4	
Progression Factor		1.46	5.62	1.23	1.25		0.89	0.88	1.37	1.00	1.00	
Incremental Delay, d2		2.2	14.9	21.7	0.5		4.6	5.0	0.8	0.1	0.2	
Delay (s)		43.8	182.1	62.3	18.8		29.4	29.9	36.8	25.5	25.5	
Level of Service		D	F	E	B		C	C	D	C	C	
Approach Delay (s)		117.0			41.4			34.2			25.5	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM Average Control Delay			74.2		HCM Level of Service				E			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			80.4%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3502		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3502		1770	1583
Volume (vph)	137	1205	855	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1268	900	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	80
Lane Group Flow (vph)	144	1268	962	0	107	28
Turn Type	Prot				Perm	
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	8.6	50.5	37.4		20.5	20.5
Effective Green, g (s)	9.1	51.0	37.9		21.0	21.0
Actuated g/C Ratio	0.11	0.64	0.47		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	391	2256	1659		465	416
v/s Ratio Prot	0.04	c0.36	0.27		c0.06	
v/s Ratio Perm						0.02
v/c Ratio	0.37	0.56	0.58		0.23	0.07
Uniform Delay, d1	32.8	8.2	15.3		23.2	22.2
Progression Factor	0.83	2.24	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.8	1.5		1.2	0.3
Delay (s)	27.6	19.1	16.8		24.3	22.5
Level of Service	C	B	B		C	C
Approach Delay (s)		20.0	16.8		23.4	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay			19.1		HCM Level of Service	B
HCM Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			45.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↲	↰	↱	↲	↰	↱	↲	↰	↱	↲
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	473	3	47	8	3	5	552	413	2	7	616	732
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	498	3	49	8	3	5	581	435	2	7	648	771
RTOR Reduction (vph)	0	0	39	0	5	0	0	0	0	0	0	529
Lane Group Flow (vph)	249	252	10	0	11	0	581	437	0	7	648	242
Turn Type	Split	Perm	Split		Prot		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	16.4	16.4	16.4		1.5		27.1	42.6		1.5	17.0	17.0
Effective Green, g (s)	16.9	16.9	16.9		2.0		27.6	43.1		2.0	17.5	17.5
Actuated g/C Ratio	0.21	0.21	0.21		0.02		0.35	0.54		0.02	0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	355	356	334		44		611	1906		44	774	346
v/s Ratio Prot	0.15	c0.15			c0.01		c0.33	0.12		0.00	c0.18	
v/s Ratio Perm			0.01									0.15
v/c Ratio	0.70	0.71	0.03		0.25		0.95	0.23		0.16	0.84	0.70
Uniform Delay, d1	29.2	29.3	25.0		38.3		25.5	9.7		38.2	29.9	28.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.25	1.15	3.30
Incremental Delay, d2	6.2	6.3	0.0		3.0		24.8	0.3		0.6	3.9	4.1
Delay (s)	35.4	35.6	25.1		41.3		50.3	10.0		48.5	38.3	99.1
Level of Service	D	D	C		D		D	A		D	D	F
Approach Delay (s)		34.5			41.3			33.0			71.2	
Approach LOS		C			D			C			E	
Intersection Summary												
HCM Average Control Delay		51.4										
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		89.2%										
Analysis Period (min)		15										
c Critical Lane Group												







13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↰	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	765	0	0	664
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	805	0	0	699
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1504	805			805	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1504	805			805	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	134	382			819	
Direction, Lane #						
Volume Total	0	805	699			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.47	0.41			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		43.6%			ICU Level of Service	A
Analysis Period (min)		15				













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	144	31	12	359	363	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	152	33	13	378	382	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609	204	408			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609	204	408			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	96	99			
cM capacity (veh/h)	422	803	1147			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	152	33	13	189	189	255 154
Volume Left	152	0	13	0	0	0 0
Volume Right	0	33	0	0	0	0 26
cSH	422	803	1147	1700	1700	1700 1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15 0.09
Queue Length 95th (ft)	40	3	1	0	0	0 0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	16.7		0.3			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization		25.5%		ICU Level of Service		A
Analysis Period (min)		15				

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	217	547	253	205	460
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	228	576	266	216	484
RTOR Reduction (vph)	0	178	0	150	0	0
Lane Group Flow (vph)	266	50	576	116	216	484
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1 6	
Permitted Phases	8		2			
Actuated Green, G (s)	13.2	13.2	26.8	26.8	9.3	40.6
Effective Green, g (s)	13.7	13.7	27.3	27.3	9.8	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	345	810	688	276	1219
v/s Ratio Prot	c0.15		c0.31		c0.12	
v/s Ratio Perm	0.03		0.07			
v/c Ratio	0.69	0.14	0.71	0.17	0.78	0.40
Uniform Delay, d1	22.6	19.8	14.5	10.8	25.5	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	0.2	5.3	0.5	13.5	1.0
Delay (s)	27.7	20.0	19.8	11.4	38.9	6.0
Level of Service	C	C	B	B	D	A
Approach Delay (s)	24.1		17.1		16.2	
Approach LOS	C		B		B	
Intersection Summary						
HCM Average Control Delay			18.5		HCM Level of Service B	
HCM Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			62.8		Sum of lost time (s) 12.0	
Intersection Capacity Utilization			64.2%		ICU Level of Service C	
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	585	53	116	492	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	616	56	122	518	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	44	0	0	77	0	56	69	0	54	0
Lane Group Flow (vph)	87	616	12	122	518	20	73	43	20	296	90	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.7	16.1	16.1	4.4	15.8	15.8	4.4	17.1	17.1	24.4	37.1	
Effective Green, g (s)	5.2	16.6	16.6	4.9	16.3	16.3	4.9	17.6	17.6	24.9	37.6	
Actuated g/C Ratio	0.07	0.21	0.21	0.06	0.20	0.20	0.06	0.22	0.22	0.31	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	115	734	328	210	721	323	210	347	331	551	783	
v/s Ratio Prot	0.05	c0.17		0.04	c0.15		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.76	0.84	0.04	0.58	0.72	0.06	0.35	0.12	0.06	0.54	0.11	
Uniform Delay, d1	36.8	30.4	25.3	36.6	29.7	25.7	36.0	25.0	24.7	22.8	11.9	
Progression Factor	1.00	1.00	1.00	0.77	0.58	0.33	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.3	8.4	0.0	3.3	2.8	0.1	1.0	0.7	0.3	1.0	0.3	
Delay (s)	61.1	38.8	25.4	31.6	19.9	8.6	37.0	25.7	25.0	23.8	12.2	
Level of Service	E	D	C	C	B	A	D	C	C	C	B	
Approach Delay (s)		40.3			20.4			28.6			20.0	
Approach LOS		D			C			C			B	
Intersection Summary												
HCM Average Control Delay		28.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.55										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		52.9%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												













18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3224	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3224	1441	3433	1863	1583
Volume (vph)	216	700	163	377	603	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	737	172	397	635	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	68	271	0	0	198
Lane Group Flow (vph)	227	737	57	397	635	108	182	442	99	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	625	279	438	377	321
v/s Ratio Prot	c0.13	0.14		c0.12	c0.18		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.44	0.11	0.77	0.56	0.21	0.87	0.71	0.36	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.1	18.7	32.7	22.5	19.8	34.6	30.1	27.9	34.0	30.7	26.3
Progression Factor	0.74	0.59	0.52	0.87	0.80	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.1	0.7	0.3	6.0	1.7	0.8	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	37.3	13.0	10.1	34.6	19.7	23.1	63.7	33.8	28.7	45.1	46.1	26.5
Level of Service	D	B	B	C	B	C	E	C	C	D	D	C
Approach Delay (s)		17.4			24.9			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		29.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		67.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												




























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↰	↑↑	↱		↕		↰	↑↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.97		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4939		1770	3539	1583		1653		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.92		0.74	0.71	1.00
Satd. Flow (perm)		4939		1770	3539	1583		1548		1312	1255	1583
Volume (vph)	0	1252	297	68	862	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1318	313	72	907	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	45	0	0	0	0	0	12	0	0	0	80
Lane Group Flow (vph)	0	1586	0	72	907	268	0	12	0	322	322	369
Turn Type	Prot			Free			Perm			Perm		
Protected Phases	4			3			2			6		
Permitted Phases				Free			2			6		
Actuated Green, G (s)	37.0			5.0			24.5			24.5		
Effective Green, g (s)	37.5			5.5			25.0			25.0		
Actuated g/C Ratio	0.47			0.07			0.31			0.31		
Clearance Time (s)	4.5			4.5			4.5			4.5		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	2315			122			2079			1583		
v/s Ratio Prot	c0.32			c0.04			0.26					
v/s Ratio Perm							0.17			0.01		
v/c Ratio	0.69			0.59			0.44			0.17		
Uniform Delay, d1	16.6			36.2			9.2			0.0		
Progression Factor	0.47			1.08			0.90			1.00		
Incremental Delay, d2	1.3			6.7			0.6			0.2		
Delay (s)	9.2			45.6			8.8			0.2		
Level of Service	A			D			A			B		
Approach Delay (s)	9.2			9.1			19.1			34.1		
Approach LOS	A			A			B			C		
Intersection Summary												
HCM Average Control Delay	16.0			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.73											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	68.2%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.81	
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1476	
Volume (vph)	21	1556	298	0	841	383	339	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1638	314	0	885	403	357	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	22	1638	314	0	885	403	357	180	181	0	16	0
Turn Type	Prot		Free		Free		Perm		Perm		Perm	
Protected Phases	7		4		8		2		2		6	
Permitted Phases			Free		Free		2		2		6	
Actuated Green, G (s)	2.2	46.5	80.0		39.8	80.0	24.5	24.5	24.5		24.5	
Effective Green, g (s)	2.7	47.0	80.0		40.3	80.0	25.0	25.0	25.0		25.0	
Actuated g/C Ratio	0.03	0.59	1.00		0.50	1.00	0.31	0.31	0.31		0.31	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3765	1583		2562	1583	434	470	470		461	
v/s Ratio Prot	0.01	c0.26			0.17			0.12				
v/s Ratio Perm			0.20			0.25	c0.26		0.12		0.01	
v/c Ratio	0.37	0.44	0.20		0.35	0.25	0.82	0.38	0.38		0.03	
Uniform Delay, d1	37.8	9.1	0.0		11.9	0.0	25.4	21.5	21.5		19.1	
Progression Factor	1.11	1.22	1.00		0.70	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.6	0.3	0.2		0.3	0.3	11.9	0.5	0.5		0.0	
Delay (s)	44.5	11.4	0.2		8.7	0.3	37.4	22.0	22.0		19.1	
Level of Service	D	B	A		A	A	D	C	C		B	
Approach Delay (s)	10.0				6.0			29.6			19.1	
Approach LOS	A				A			C			B	
Intersection Summary												
HCM Average Control Delay			12.3			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			50.3%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4911	1610	3330	1583	1610	3387	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4911	1610	3330	1583	1610	3387	1583	1583
Volume (vph)	235	1221	462	165	682	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1285	486	174	718	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	346	0	63	0	0	204	0	0	131	0
Lane Group Flow (vph)	247	1285	140	174	868	0	229	483	50	181	380	29
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Perm
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	12.6	22.6	22.6	10.0	20.0	15.4	15.4	15.4	14.0	14.0	14.0	14.0
Effective Green, g (s)	13.1	23.1	23.1	10.5	20.5	15.9	15.9	15.9	14.5	14.5	14.5	14.5
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.26	0.20	0.20	0.20	0.18	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	562	1022	457	232	1258	320	662	315	292	614	287	287
v/s Ratio Prot	0.07	c0.36	0.10	c0.18	0.14	c0.15	c0.11	0.11	0.11	0.11	0.11	0.11
v/s Ratio Perm	0.44	1.26	0.31	0.75	0.69	0.72	0.73	0.16	0.62	0.62	0.10	0.02
v/c Ratio	0.44	1.26	0.31	0.75	0.69	0.72	0.73	0.16	0.62	0.62	0.10	0.02
Uniform Delay, d1	30.1	28.4	22.2	33.5	26.9	29.9	30.0	26.5	30.2	30.2	27.3	27.3
Progression Factor	0.72	0.77	2.02	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	123.3	1.6	12.8	3.1	7.4	4.0	0.2	3.9	1.9	0.2	0.2
Delay (s)	22.2	145.1	46.6	46.2	30.0	37.4	34.1	26.8	34.1	32.1	27.5	27.5
Level of Service	C	F	D	D	C	D	C	C	C	C	C	C
Approach Delay (s)	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3
Approach LOS	F	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM Average Control Delay	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4
HCM Volume to Capacity ratio	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated Cycle Length (s)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Intersection Capacity Utilization	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%	79.1%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Volume (vph)	149	583	228	140	661	113	323	483	113	107	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	119	340	508	119	113	377	247
RTOR Reduction (vph)	0	59	0	0	0	90	0	75	0	0	179	0
Lane Group Flow (vph)	157	795	0	147	696	29	340	508	44	113	377	68
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	5.5	16.5	5.5	16.5	16.5	13.5	25.7	25.7	5.2	17.4	17.4	17.4
Effective Green, g (s)	6.0	17.0	6.0	17.0	17.0	14.0	26.2	26.2	5.7	17.9	17.9	17.9
Actuated g/C Ratio	0.08	0.24	0.08	0.24	0.24	0.20	0.37	0.37	0.08	0.25	0.25	0.25
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	813	150	849	380	350	688	585	142	470	400	400
v/s Ratio Prot	c0.09	c0.23	0.08	0.20	c0.19	c0.27	0.06	0.20	0.06	0.20	0.06	0.20
v/s Ratio Perm	1.05	0.98	0.98	0.82	0.08	0.97	0.74	0.08	0.80	0.80	0.04	0.17
v/c Ratio	1.05	0.98	0.98	0.82	0.08	0.97	0.74	0.08	0.80	0.80	0.04	0.17
Uniform Delay, d1	32.5	26.8	32.4	25.5	20.9	28.3	19.4	14.5	32.0	24.8	20.7	20.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	86.4	25.8	66.6	6.2	0.1	40.3	7.0	0.2	25.7	13.5	0.9	0.9
Delay (s)	118.9	52.6	99.0	31.7	20.9	68.5	26.3	14.7	57.7	38.3	21.6	21.6
Level of Service	F	D	F	C	C	E	C	B	E	D	C	C
Approach Delay (s)	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9	62.9
Approach LOS	E	E	E	E	E	E	E	E	E	E	E	E
Intersection Summary												
HCM Average Control Delay	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
HCM Volume to Capacity ratio	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Actuated Cycle Length (s)	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9	70.9
Intersection Capacity Utilization	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%	81.2%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3516		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3516		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	708	32	53	797	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	745	34	56	839	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	4	0	0	0	167	0	57	0	0	61	0
Lane Group Flow (vph)	128	775	0	56	839	260	51	34	0	623	84	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.5	21.8		4.4	20.7	20.7	3.3	6.4		39.4	42.5	
Effective Green, g (s)	6.0	22.3		4.9	21.2	21.2	3.8	6.9		39.9	43.0	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	871		96	834	373	75	128		785	783	
v/s Ratio Prot	0.07	c0.22		0.03	c0.24		c0.03	0.02		c0.35	c0.05	
v/s Ratio Perm						0.16						
v/c Ratio	1.08	0.89		0.58	1.01	0.70	0.68	0.26		0.79	0.11	
Uniform Delay, d1	42.0	32.7		41.6	34.4	31.5	42.5	39.2		21.5	12.9	
Progression Factor	1.00	1.00		0.68	0.61	0.24	1.00	1.00		1.00	1.00	
Incremental Delay, d2	107.4	13.2		7.7	30.7	9.2	22.4	1.1		5.5	0.1	
Delay (s)	149.4	45.9		35.8	51.6	16.9	64.9	40.3		27.1	13.0	
Level of Service	F	D		D	D	B	E	D		C	B	
Approach Delay (s)		60.5			39.7			49.1			24.4	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM Average Control Delay		42.4							D			
HCM Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		90.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		78.7%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	953	412	66	998	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	434	69	1051	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	94	0	0	0	0	0	0	0	69	0
Lane Group Flow (vph)	0	1003	340	69	1051	0	0	0	0	674	203	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.30					c0.20	0.13	
v/s Ratio Perm			0.21									
v/c Ratio		0.69	0.52	0.29	0.50					0.61	0.40	
Uniform Delay, d1		21.9	20.0	35.1	10.8					25.7	23.7	
Progression Factor		0.49	0.44	1.21	1.53					1.00	1.00	
Incremental Delay, d2		1.6	1.8	0.6	0.8					1.0	2.3	
Delay (s)		12.4	10.5	43.0	17.4					26.7	26.0	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		11.8			19.0				0.0		26.5	
Approach LOS		B			B				A		C	
Intersection Summary												
HCM Average Control Delay			18.1							B		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			67.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	375	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	395	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	395	273
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	60.8			60.8	20.2	20.2
Effective Green, g (s)	61.3			61.3	20.7	20.7
Actuated g/C Ratio	0.68			0.68	0.23	0.23
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2410			2410	790	364
v/s Ratio Prot	c0.47			0.20	0.12	
v/s Ratio Perm					c0.17	
v/c Ratio	0.70			0.30	0.50	0.75
Uniform Delay, d1	8.7			5.7	30.1	32.2
Progression Factor	0.35			1.00	1.00	1.00
Incremental Delay, d2	1.3			0.3	0.5	8.4
Delay (s)	4.3			6.1	30.6	40.7
Level of Service	A			A	C	D
Approach Delay (s)	4.3			6.1	34.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay	11.5				HCM Level of Service	B
HCM Volume to Capacity ratio	0.71					
Actuated Cycle Length (s)	90.0				Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.7%				ICU Level of Service	C
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↖	↖	↖	↖	↖
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	11	5	8	23	25	219	7	728	26	132	585	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	5	8	24	26	231	7	766	27	139	616	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)							5					
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC1, conflicting volume	1424	1706	312	1378	1682	383	623			794		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1424	1706	312	1378	1682	383	623			794		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	70	93	99	71	66	63	99			83		
cM capacity (veh/h)	39	75	684	84	77	615	954			823		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	281	7	383	383	27	139	411	213			
Volume Left	12	24	7	0	0	0	139	0	0			
Volume Right	8	231	0	0	0	27	0	0	7			
cSH	66	448	954	1700	1700	1700	823	1700	1700			
Volume to Capacity	0.38	0.63	0.01	0.23	0.23	0.02	0.17	0.24	0.13			
Queue Length 95th (ft)	36	105	1	0	0	0	15	0	0			
Control Delay (s)	90.2	30.8	8.8	0.0	0.0	0.0	10.3	0.0	0.0			
Lane LOS	F	D	A				B					
Approach Delay (s)	90.2	30.8	0.1				1.9					
Approach LOS	F	D										
Intersection Summary												
Average Delay				6.7								
Intersection Capacity Utilization				47.0%			ICU Level of Service			A		
Analysis Period (min)				15								

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	265	2	1	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	1	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	3	1								
Volume Left	1	7	1	0								
Volume Right	5	2	2	0								
cSH	1281	1402	699	488								
Volume to Capacity	0.00	0.01	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.2	10.2	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.2	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization		28.9%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel










2020
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↙	↘
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			193			493	493	181	521	505	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			193			493	493	181	521	505	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			75	100	97	100	100	100
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	193	275	147	0								
Volume Left	0	38	120	0								
Volume Right	24	0	27	0								
cSH	1330	1381	519	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	29	0								
Control Delay (s)	0.0	1.3	14.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.3	14.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		41.6%			ICU Level of Service				A			
Analysis Period (min)		15										

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	773	268	77	383	768	585	108	368	477	308
v/c Ratio	0.33	0.85	0.55	0.12	0.58	0.77	2.65	0.43	0.81	0.73	1.03
Control Delay	48.0	65.4	26.4	31.1	40.3	16.2	778.1	75.6	20.8	68.1	108.5
Queue Delay	0.0	4.6	0.0	0.0	22.2	1.5	0.0	0.0	5.1	172.0	0.0
Total Delay	48.0	70.0	26.4	31.1	62.4	17.8	778.1	75.6	25.8	240.0	108.5
Queue Length 50th (ft)	129	421	121	52	328	182	~1028	58	0	243	~267
Queue Length 95th (ft)	191	489	220	m82	413	257	#1271	89	110	#350	#471
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	532	623	656	992	221	376	497	656	298
Starvation Cap Reductn	0	0	0	0	270	94	0	0	0	0	0
Spillback Cap Reductn	0	176	0	0	0	0	0	0	78	309	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.92	0.50	0.12	0.99	0.86	2.65	0.29	0.88	1.37	1.03
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1323	298	81	718	374	810
v/c Ratio	0.79	0.33	0.32	0.35	0.72	0.71
Control Delay	30.3	5.1	38.9	8.3	32.9	21.2
Queue Delay	43.3	0.6	0.0	0.1	0.0	0.8
Total Delay	73.6	5.7	38.9	8.4	32.9	22.0
Queue Length 50th (ft)	675	55	18	42	179	141
Queue Length 95th (ft)	741	m50	m40	78	#292	210
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	908	257	2035	523	1142
Starvation Cap Reductn	465	311	0	0	0	0
Spillback Cap Reductn	0	0	0	258	0	117
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.50	0.32	0.40	0.72	0.79
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						
m Volume for 95th percentile queue is metered by upstream signal.						

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	799	899	525	484	173	182	601	9	18
v/c Ratio	0.70	0.95	0.94	0.31	0.50	0.52	0.57	0.02	0.05
Control Delay	43.9	36.0	65.1	18.8	30.1	30.5	5.7	25.7	18.8
Queue Delay	0.0	44.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	43.9	80.0	65.1	18.8	30.1	30.5	6.1	25.7	18.8
Queue Length 50th (ft)	185	345	148	123	53	56	0	4	4
Queue Length 95th (ft)	0	#488	#239	170	m109	m115	61	16	21
Internal Link Dist (ft)	466		345		380				270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	951	558	1542	347	349	1052	365	363
Starvation Cap Reductn	0	134	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	118	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.10	0.94	0.31	0.50	0.52	0.64	0.02	0.05
Intersection Summary									
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1268	967	107	108
v/c Ratio	0.37	0.56	0.58	0.23	0.22
Control Delay	28.9	19.3	17.2	24.8	6.3
Queue Delay	0.0	1.7	0.0	0.0	0.0
Total Delay	28.9	21.0	17.2	24.8	6.3
Queue Length 50th (ft)	43	303	174	42	0
Queue Length 95th (ft)	m56	323	246	83	36
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1665	465	495
Starvation Cap Reductn	0	762	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.85	0.58	0.23	0.22
Intersection Summary					
m	Volume for 95th percentile queue is metered by upstream signal.				







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	249	252	49	16	581	437	7	648	771
v/c Ratio	0.70	0.71	0.13	0.11	1.09	0.20	0.05	0.59	0.81
Control Delay	39.6	39.9	8.2	29.3	96.8	9.3	42.0	30.7	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Total Delay	39.6	39.9	8.2	29.3	96.8	9.3	42.0	30.7	15.2
Queue Length 50th (ft)	121	123	0	5	~333	34	4	171	180
Queue Length 95th (ft)	190	192	25	23	#524	124	m4	m#367	m#195
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	452	179	531	2224	177	1094	957
Starvation Cap Reductn	0	0	0	0	0	0	0	0	65
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.57	0.11	0.09	1.09	0.20	0.04	0.59	0.86
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	228	576	266	216	484
v/c Ratio	0.69	0.44	0.71	0.32	0.78	0.40
Control Delay	32.6	6.3	21.6	3.1	48.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	6.3	21.6	3.1	48.1	6.7
Queue Length 50th (ft)	94	0	180	0	82	78
Queue Length 95th (ft)	164	47	#307	38	#186	134
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	562	809	838	281	1219
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.41	0.71	0.32	0.77	0.40
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020
PM Peak

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	616	56	122	518	97	73	99	89	296	144
v/c Ratio	0.61	0.84	0.15	0.47	0.72	0.24	0.28	0.23	0.21	0.56	0.17
Control Delay	56.3	42.3	8.9	32.8	22.2	3.3	38.1	11.9	7.7	28.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	42.3	8.9	32.8	22.2	3.3	38.1	11.9	7.7	28.4	5.5
Queue Length 50th (ft)	43	155	0	18	98	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#236	29	m42	m135	m4	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	142	752	380	257	752	413	257	437	433	531	872
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.82	0.15	0.47	0.69	0.23	0.28	0.23	0.21	0.56	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	737	172	397	635	335	182	510	370	357	317	248
v/c Ratio	0.81	0.44	0.27	0.77	0.56	0.46	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	44.1	13.2	2.7	38.7	20.2	4.9	73.5	32.0	11.7	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	13.2	2.7	38.7	20.2	4.9	73.5	32.0	11.7	51.7	51.3	7.3
Queue Length 50th (ft)	67	57	5	109	137	37	92	107	15	92	151	0
Queue Length 95th (ft)	m#139	m67	m10	m#160	m202	m46	#210	162	104	#172	#279	57
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1134	735	210	751	571	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.44	0.27	0.77	0.56	0.46	0.87	0.68	0.65	0.81	0.80	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1631	72	907	268	24	322	322	449
v/c Ratio	0.68	0.49	0.44	0.17	0.05	0.78	0.82	0.78
Control Delay	9.3	49.5	9.7	0.2	9.5	38.5	42.5	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	49.5	9.7	0.2	9.5	38.5	42.5	27.8
Queue Length 50th (ft)	147	31	153	0	2	143	146	142
Queue Length 95th (ft)	223	m70	m94	m0	17	238	#267	247
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2413	147	2078	1583	576	476	455	648
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.49	0.44	0.17	0.04	0.68	0.71	0.69
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1638	314	885	403	357	181	182	18
v/c Ratio	0.17	0.44	0.20	0.32	0.25	0.82	0.38	0.39	0.04
Control Delay	40.7	13.1	0.2	9.5	0.3	40.0	21.7	21.8	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	13.1	0.2	9.5	0.3	40.0	21.7	21.8	13.3
Queue Length 50th (ft)	12	170	0	69	0	165	73	73	5
Queue Length 95th (ft)	m16	234	m0	116	m0	213	102	103	15
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3762	1583	2731	1583	730	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.44	0.20	0.32	0.25	0.49	0.23	0.23	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020
PM Peak

	↖	→	↗	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1285	486	174	931	229	483	254	181	380	160
v/c Ratio	0.44	1.26	0.61	0.75	0.70	0.71	0.73	0.49	0.62	0.62	0.38
Control Delay	24.3	148.2	8.4	60.0	29.0	43.2	36.9	7.4	39.4	34.4	7.7
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	148.2	8.8	60.0	29.0	43.2	36.9	7.4	39.4	34.4	7.7
Queue Length 50th (ft)	63	~447	114	88	145	116	123	0	91	96	0
Queue Length 95th (ft)	80	#571	6	#222	#213	#214	176	58	158	138	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1020	802	231	1323	342	707	536	342	720	462
Starvation Cap Reductn	0	0	63	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.26	0.66	0.75	0.70	0.67	0.68	0.47	0.53	0.53	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020
PM Peak

	↖	→	↗	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	119	340	508	119	113	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.25	0.96	0.73	0.18	0.66	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.3	70.2	28.0	4.4	50.7	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.3	70.2	28.0	4.4	50.7	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	48	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	36	#298	#346	31	#115	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	475	354	698	667	172	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.25	0.96	0.73	0.18	0.66	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020
PM Peak

	↖	→	↗	←	↖	↗	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	779	56	839	427	51	91	623	145
v/c Ratio	1.08	0.79	0.47	0.93	0.75	0.43	0.44	0.81	0.17
Control Delay	150.1	38.1	39.4	37.0	12.3	52.2	22.9	34.4	5.2
Queue Delay	0.0	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	150.1	38.4	39.4	37.0	12.8	52.2	22.9	34.4	5.2
Queue Length 50th (ft)	~82	221	32	242	5	28	16	310	9
Queue Length 95th (ft)	#194	#321	m60	#353	#103	65	59	#556	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	118	980	118	904	567	118	366	767	844
Starvation Cap Reductn	0	0	0	0	17	0	0	0	0
Spillback Cap Reductn	0	24	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.81	0.47	0.93	0.78	0.43	0.25	0.81	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	→	↗	↖	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	434	69	1051	674	272
v/c Ratio	0.67	0.57	0.27	0.50	0.61	0.47
Control Delay	12.7	8.0	42.4	17.7	28.6	17.9
Queue Delay	0.4	0.3	0.0	0.3	0.0	0.0
Total Delay	13.1	8.3	42.4	18.0	28.6	17.9
Queue Length 50th (ft)	155	81	37	246	164	73
Queue Length 95th (ft)	191	m118	m79	307	222	147
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	757	295	2084	1106	579
Starvation Cap Reductn	137	63	0	404	0	0
Spillback Cap Reductn	34	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.63	0.23	0.63	0.61	0.47
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	395	287
v/c Ratio	0.70	0.30	0.50	0.76
Control Delay	4.9	7.0	31.3	42.5
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	4.9	7.0	31.3	42.5
Queue Length 50th (ft)	189	75	100	143
Queue Length 95th (ft)	250	137	125	205
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2409	2409	1221	574
Starvation Cap Reductn	61	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.30	0.32	0.50
Intersection Summary				

TRIP GENERATION – ALTERNATIVES A, B, & C

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Casino 450,000 s.f.	17,744	930	398	1,328	1,181	1,047	2,228
Hotel 300 Room*	817	34	22	56	31	28	59
Net New Vehicle Trips	18,261	964	420	1,384	1,212	1,075	2,287

*Trip rate is ITE Land Use Code 310 – Hotel. Rate reduced by 2/3 to account for internal capture to/from casino.

TRIP GENERATION – ALTERNATIVES D & H

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Casino 315,100 s.f.	12,424	651	279	930	827	733	1,560
Hotel 100 Room*	272	12	7	19	11	9	20
Net New Vehicle Trips	12,696	663	286	949	838	742	1,580

*Trip rate is ITE Land Use Code 310 – Hotel. Rate reduced by 2/3 to account for internal capture to/from casino.

TRIP GENERATION – ALTERNATIVE E

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Light Industrial 400,000 s.f.	2,788	324	44	368	47	345	392
Commercial 100,000 s.f.	4,294	63	40	103	180	195	375
Subtotal	7,082	387	84	471	227	540	767
Commercial Pass-by Reduction	N/A	N/A	N/A	N/A	-70	-76	-146
Net New Vehicle Trips	7,082	387	84	471	157	464	621

TRIP GENERATION – VARIANT H-SUB1

LAND USE	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total
Casino 359,600 s.f.	14,179	743	318	1,061	943	837	1,780
Hotel 200 Rooms*	545	23	14	37	21	18	39
Net New Vehicle Trips	14,724	766	332	1,098	964	855	1,819

*Trip rate is ITE Land Use Code 310 – Hotel. Rate reduced by 2/3 to account for internal capture to/from casino.

**NEAR-TERM 2008 + ALTERNATIVE A
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Avenue & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	8	14	139	11	155	11	754	116	185	514	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	146	12	163	12	794	122	195	541	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1838	1873	544	1827	1815	855	547			916		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1838	1873	544	1827	1815	855	547			916		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	84	97	0	80	54	99			74		
cM capacity (veh/h)	21	53	539	40	57	358	1022			745		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	321	12	916	195	547						
Volume Left	0	146	12	0	195	0						
Volume Right	15	163	0	122	0	6						
cSH	123	75	1022	1700	745	1700						
Volume to Capacity	0.19	4.29	0.01	0.54	0.26	0.32						
Queue Length 95th (ft)	16	Err	1	0	26	0						
Control Delay (s)	40.8	Err	8.6	0.0	11.5	0.0						
Lane LOS	E	F	A		B							
Approach Delay (s)	40.8	Err	0.1		3.0							
Approach LOS	E	F										
Intersection Summary												
Average Delay		1595.8										
Intersection Capacity Utilization		81.9%		ICU Level of Service		D						
Analysis Period (min)		15										

2: Wilfred Avenue & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	10	289	10	8	284	8	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	304	11	8	299	8	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	307			315			666	655	309	666	656	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	307			315			666	655	309	666	656	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	99	97	97	99
cM capacity (veh/h)	1253			1245			356	380	731	355	379	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	325	316	32	32								
Volume Left	11	8	11	11								
Volume Right	11	8	11	11								
cSH	1253	1245	440	441								
Volume to Capacity	0.01	0.01	0.07	0.07								
Queue Length 95th (ft)	1	1	6	6								
Control Delay (s)	0.3	0.3	13.8	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	13.8	13.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay		1.5										
Intersection Capacity Utilization		30.4%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Avenue & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	288	10	7	280	15	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	303	11	7	295	16	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	311			314			663	655	308	663	652	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311			314			663	655	308	663	652	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	99	97	97	99
cM capacity (veh/h)	1250			1247			358	380	732	358	382	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	324	318	32	32								
Volume Left	11	7	11	11								
Volume Right	11	16	11	11								
cSH	1250	1247	442	443								
Volume to Capacity	0.01	0.01	0.07	0.07								
Queue Length 95th (ft)	1	0	6	6								
Control Delay (s)	0.3	0.2	13.8	13.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	13.8	13.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			30.6%		ICU Level of Service			A				
Analysis Period (min)			15									












4: Wilfred Avenue & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	138	159	194	185	8	118	21	160	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	145	167	204	195	8	124	22	168	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	203			313			873	862	229	1037	941	199
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	203			313			873	862	229	1037	941	199
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			84			45	91	79	92	95	99
cM capacity (veh/h)	1369			1248			224	243	810	134	218	842
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	323	407	315	32								
Volume Left	11	204	124	11								
Volume Right	167	8	168	11								
cSH	1369	1248	369	227								
Volume to Capacity	0.01	0.16	0.85	0.14								
Queue Length 95th (ft)	1	15	200	12								
Control Delay (s)	0.3	5.0	51.3	23.4								
Lane LOS	A	A	F	C								
Approach Delay (s)	0.3	5.0	51.3	23.4								
Approach LOS			F	C								
Intersection Summary												
Average Delay			17.7									
Intersection Capacity Utilization			72.6%		ICU Level of Service			C				
Analysis Period (min)			15									












5: Wilfred Avenue & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↕													
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Volume (veh/h)	15	229	63	591	361	25	26	24	532	17	3	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	16	241	66	622	380	26	27	25	560	18	3	1		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type							None			None				
Median storage (veh)														
Upstream signal (ft)														
pX, platoon unblocked														
vC, conflicting volume	406				307				1946	1956	274	2516	1976	393
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	406				307				1946	1956	274	2516	1976	393
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				50				0	20	27	0	90	100
cM capacity (veh/h)	1152				1253				27	32	765	1	31	656
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	323	1028	613	22										
Volume Left	16	622	27	18										
Volume Right	66	26	560	1										
cSH	1152	1253	242	1										
Volume to Capacity	0.01	0.50	2.53	15.89										
Queue Length 95th (ft)	1	71	1271	Err										
Control Delay (s)	0.5	9.2	733.2	Err										
Lane LOS	A	A	F	F										
Approach Delay (s)	0.5	9.2	733.2	Err										
Approach LOS			F	F										
Intersection Summary														
Average Delay	342.3													
Intersection Capacity Utilization	114.9%			ICU Level of Service					H					
Analysis Period (min)	15													

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↕													
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Volume (veh/h)	11	708	59	82	950	23	21	14	75	14	2	6		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	12	745	62	86	1000	24	22	15	79	15	2	6		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type							None			None				
Median storage veh														
Upstream signal (ft)	630													
pX, platoon unblocked	0.67							0.67	0.67	0.67	0.67	0.67		
vC, conflicting volume	1024				807				1992	1996	776	2071	2015	1012
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	1036				807				2480	2487	776	2598	2516	1018
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97				89				0	14	80	0	87	97
cM capacity (veh/h)	449				818				11	17	397	2	16	193
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	819	1111	116	23										
Volume Left	12	86	22	15										
Volume Right	62	24	79	6										
cSH	449	818	37	3										
Volume to Capacity	0.03	0.11	3.14	6.84										
Queue Length 95th (ft)	2	9	Err	Err										
Control Delay (s)	0.8	3.2	Err	Err										
Lane LOS	A	A	F	F										
Approach Delay (s)	0.8	3.2	Err	Err										
Approach LOS			F	F										
Intersection Summary														
Average Delay	673.7													
Intersection Capacity Utilization	113.3%			ICU Level of Service					H					
Analysis Period (min)	15													

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.97	1.00	
Frt	0.99	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	1.00	0.93	
Flt Protected	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1836	1681	1770	1583	1770	3539	1583	3433	1738			
Flt Permitted	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1836	1681	1770	1583	1770	3539	1583	3433	1738			
Volume (vph)	50	681	67	180	778	541	172	154	267	425	128	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	717	71	189	819	569	181	162	281	447	135	109
RTOR Reduction (vph)	0	2	0	0	172	0	0	258	0	18	0	0
Lane Group Flow (vph)	0	839	0	189	819	397	181	162	23	447	226	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases					8				2			
Actuated Green, G (s)	48.3			53.6	53.6	53.6	18.6	12.6	12.6	27.5	21.5	
Effective Green, g (s)	48.8			54.1	54.1	54.1	19.1	13.1	13.1	28.0	22.0	
Actuated g/C Ratio	0.30			0.34	0.34	0.34	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)	4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	560			568	598	535	211	290	130	601	239	
v/s Ratio Prot	c0.46			0.11	c0.46		c0.10	0.05		0.13	c0.13	
v/s Ratio Perm					0.25			0.01				
v/c Ratio	1.50			0.33	1.37	0.74	0.86	0.56	0.18	0.74	0.95	
Uniform Delay, d1	55.6			39.5	53.0	46.8	69.1	70.7	68.4	62.6	68.4	
Progression Factor	1.00			0.76	0.78	0.82	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	233.4			1.2	174.4	6.9	27.4	2.3	0.7	4.9	42.7	
Delay (s)	289.0			31.1	215.5	45.4	96.5	73.0	69.1	64.6	107.9	
Level of Service	F			C	F	D	F	E	E	E	F	
Approach Delay (s)	289.0			132.0			78.1			79.9		
Approach LOS	F			F			E			E		
Intersection Summary												
HCM Average Control Delay	148.7											
HCM Volume to Capacity ratio	1.28											
Actuated Cycle Length (s)	160.0											
Intersection Capacity Utilization	114.0%											
Analysis Period (min)	15											
c Critical Lane Group												



















8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Volume (vph)	5	30	138	5	95	95	164	151	5	30	237	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	145	5	100	100	173	159	5	32	249	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	1	0
Lane Group Flow (vph)	5	32	15	5	111	0	173	159	3	32	253	0
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot		
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases			4							2		
Actuated Green, G (s)	1.3	8.0	8.0	1.3	8.0		12.7	49.4	49.4	3.3	40.0	
Effective Green, g (s)	1.8	8.5	8.5	1.8	8.5		13.2	49.9	49.9	3.8	40.5	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.16	0.62	0.62	0.05	0.51	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	198	168	40	348		292	2207	987	84	1787	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.04		0.02	c0.07	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.16	0.09	0.12	0.32		0.59	0.07	0.00	0.38	0.14	
Uniform Delay, d1	38.3	32.5	32.3	38.3	33.1		30.9	5.9	5.7	37.0	10.5	
Progression Factor	1.00	1.00	1.00	0.86	0.93		1.02	0.67	0.59	1.00	1.00	
Incremental Delay, d2	1.4	0.4	0.2	1.0	0.4		1.8	0.0	0.0	2.9	0.2	
Delay (s)	39.7	32.9	32.5	33.9	31.2		33.3	4.0	3.4	39.8	10.7	
Level of Service	D	C	C	C	C		C	A	A	D	B	
Approach Delay (s)	32.8			31.3			19.0			13.9		
Approach LOS	C			C			B			B		
Intersection Summary												
HCM Average Control Delay	22.5											
HCM Volume to Capacity ratio	0.26											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	31.5%											
Analysis Period (min)	15											
c Critical Lane Group												





























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3057	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3057	
Volume (vph)	0	814	557	93	880	0	0	0	0	327	327	619
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	857	586	98	926	0	0	0	0	344	344	652
RTOR Reduction (vph)	0	0	140	0	0	0	0	0	0	0	88	0
Lane Group Flow (vph)	0	857	446	98	926	0	0	0	0	344	908	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8						6
Permitted Phases		4						6				
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	994	
v/s Ratio Prot		0.24		0.03		c0.26						
v/s Ratio Perm		c0.28						0.21		0.30		
v/c Ratio		0.52	0.61	0.47	0.46					0.66	1.13dr	
Uniform Delay, d1		15.2	16.0	36.3	9.8					23.2	25.9	
Progression Factor		1.17	1.69	1.42	2.06					1.00	1.00	
Incremental Delay, d2		0.1	0.3	0.8	0.3					6.4	14.1	
Delay (s)		17.8	27.5	52.4	20.5					29.5	40.0	
Level of Service		B	C	D	C					C	D	
Approach Delay (s)		21.7		23.6		0.0		37.3				
Approach LOS		C		C		A		D				
Intersection Summary												
HCM Average Control Delay		27.7		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0		D				
Intersection Capacity Utilization		73.5%		ICU Level of Service								
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		 	 			 	 		 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3393		1681	1708	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3393		1681	1708	2787	1770	1814	
Volume (vph)	0	499	643	409	305	116	659	107	572	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	525	677	431	321	122	694	113	602	44	43	9
RTOR Reduction (vph)	0	0	516	0	50	0	0	0	478	0	7	0
Lane Group Flow (vph)	0	525	161	431	394	0	393	414	124	44	45	0
Turn Type	Perm	Perm		Prot		Split		Perm		Split		
Protected Phases		4		3		8		2		2		6
Permitted Phases	4	4						2				6
Actuated Green, G (s)		18.5	18.5	11.5	34.5		16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)		19.0	19.0	12.0	35.0		16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio		0.24	0.24	0.15	0.44		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1208	376	515	1484		347	352	575	365	374	
v/s Ratio Prot		c0.10		c0.13		0.12		0.23		c0.24		c0.02
v/s Ratio Perm		0.10						0.04				
v/c Ratio		0.43	0.43	0.84	0.27		1.13	1.18	0.22	0.12	0.12	
Uniform Delay, d1		25.9	25.9	33.0	14.3		31.8	31.8	26.4	25.8	25.8	
Progression Factor		0.88	5.42	1.42	1.88		0.64	0.64	0.66	1.12	1.15	
Incremental Delay, d2		1.0	3.0	10.6	0.4		80.8	97.3	0.6	0.7	0.7	
Delay (s)		23.7	143.3	57.4	27.4		101.2	117.7	18.0	29.7	30.3	
Level of Service		C	F	E	C		F	F	B	C	C	
Approach Delay (s)		91.1		42.2		70.5		30.0				
Approach LOS		F		D		E		C				
Intersection Summary												
HCM Average Control Delay		69.4		HCM Level of Service				E				
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)				16.0				
Intersection Capacity Utilization		64.8%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												






















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↖	↗↗	↖↖		↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3510		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3510		1770	1583
Volume (vph)	187	926	614	35	93	217
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	975	646	37	98	228
RTOR Reduction (vph)	0	0	4	0	0	168
Lane Group Flow (vph)	197	975	679	0	98	60
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.7	50.5	36.3		20.5	20.5
Effective Green, g (s)	10.2	51.0	36.8		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	438	2256	1615		465	416
v/s Ratio Prot	0.06	c0.28	0.19		c0.06	
v/s Ratio Perm						0.04
v/c Ratio	0.45	0.43	0.42		0.21	0.14
Uniform Delay, d1	32.3	7.3	14.5		23.0	22.6
Progression Factor	0.79	1.15	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.5	0.8		1.0	0.7
Delay (s)	26.2	8.9	15.3		24.1	23.3
Level of Service	C	A	B		C	C
Approach Delay (s)	11.8	15.3			23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		14.6		HCM Level of Service		B
HCM Volume to Capacity ratio		0.37				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		38.6%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	858	3	40	8	3	5	514	475	2	7	408	679
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	903	3	42	8	3	5	541	500	2	7	429	715
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	569
Lane Group Flow (vph)	452	454	11	0	11	0	541	501	0	7	429	146
Turn Type	Split		Perm	Split			Prot			Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.5	20.5	20.5		1.5		27.1	38.5		1.5	12.9	12.9
Effective Green, g (s)	21.0	21.0	21.0		2.0		27.6	39.0		2.0	13.4	13.4
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	441	443	416		44		611	1724		44	593	265
v/s Ratio Prot	0.27	c0.27			c0.01		c0.31	0.14		0.00	c0.12	
v/s Ratio Perm			0.01									0.09
v/c Ratio	1.02	1.02	0.03		0.25		0.89	0.29		0.16	0.72	0.55
Uniform Delay, d1	29.5	29.5	21.9		38.3		24.7	12.2		38.2	31.5	30.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.24	0.96	3.90
Incremental Delay, d2	49.4	49.2	0.0		3.0		14.4	0.4		1.1	4.8	5.0
Delay (s)	78.9	78.7	21.9		41.3		39.1	12.7		48.6	35.2	124.0
Level of Service	E	E	C		D		D	B		D	D	F
Approach Delay (s)		76.3			41.3			26.4			90.4	
Approach LOS		E			D			C			F	
Intersection Summary												
HCM Average Control Delay			64.8		HCM Level of Service					E		
HCM Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					16.0		
Intersection Capacity Utilization			83.9%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	891	0	0	686
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	938	0	0	722
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1660	938			938	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1660	938			938	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	107	321			731	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	938	722			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.55	0.42			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		50.2%		ICU Level of Service	A	
Analysis Period (min)		15				














14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Volume (veh/h)	305	105	74	0	0	322
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	321	111	78	0	0	339
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	78				831	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				831	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				100	66
cM capacity (veh/h)	1521				268	983
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	432	78	339			
Volume Left	321	0	0			
Volume Right	0	0	339			
cSH	1521	1700	983			
Volume to Capacity	0.21	0.05	0.34			
Queue Length 95th (ft)	20	0	39			
Control Delay (s)	6.4	0.0	10.6			
Lane LOS	A		B			
Approach Delay (s)	6.4	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			7.5			
Intersection Capacity Utilization		55.7%		ICU Level of Service	B	
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations				 	 		
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	172	89	33	464	489	41	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	181	94	35	488	515	43	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	850	279	558				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	850	279	558				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	37	87	97				
cM capacity (veh/h)	289	718	1009				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	181	94	35	244	244	343	215
Volume Left	181	0	35	0	0	0	0
Volume Right	0	94	0	0	0	0	43
cSH	289	718	1009	1700	1700	1700	1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20	0.13
Queue Length 95th (ft)	97	11	3	0	0	0	0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	B	A				
Approach Delay (s)	27.5		0.6			0.0	
Approach LOS	D						
Intersection Summary							
Average Delay			5.8				
Intersection Capacity Utilization			37.7%		ICU Level of Service		A
Analysis Period (min)			15				

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	286	605	251	212	473
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	301	637	264	223	498
RTOR Reduction (vph)	0	235	0	150	0	0
Lane Group Flow (vph)	271	66	637	114	223	498
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.7	26.7	9.4	40.6
Effective Green, g (s)	13.8	13.8	27.2	27.2	9.9	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	806	685	279	1217
v/s Ratio Prot	c0.15		c0.34		c0.13	
v/s Ratio Perm	0.04		0.07			
v/c Ratio	0.70	0.19	0.79	0.17	0.80	0.41
Uniform Delay, d1	22.6	20.0	15.4	10.9	25.5	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.3	7.8	0.5	14.7	1.0
Delay (s)	28.0	20.3	23.2	11.4	40.3	6.2
Level of Service	C	C	C	B	D	A
Approach Delay (s)	24.0		19.7			16.7
Approach LOS	C		B			B
Intersection Summary						
HCM Average Control Delay		19.8		HCM Level of Service		B
HCM Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		62.9		Sum of lost time (s)		12.0
Intersection Capacity Utilization		67.8%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	600	36	202	575	459	64	19	154	592	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	483	67	20	162	623	45	104
RTOR Reduction (vph)	0	0	29	0	0	358	0	63	69	0	59	0
Lane Group Flow (vph)	53	632	9	213	605	125	67	34	16	623	90	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.0	18.0	5.5	20.2	20.2	4.4	14.1	14.1	24.4	34.1	
Effective Green, g (s)	3.8	18.5	18.5	6.0	20.7	20.7	4.9	14.6	14.6	24.9	34.6	
Actuated g/C Ratio	0.05	0.23	0.23	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	257	916	410	210	285	274	551	721	
v/s Ratio Prot	0.03	c0.18		c0.06	0.17		c0.02	c0.02		c0.35	0.05	
v/s Ratio Perm			0.01			0.08			0.01			
v/c Ratio	0.63	0.77	0.02	0.83	0.66	0.30	0.32	0.12	0.06	1.13	0.12	
Uniform Delay, d1	37.4	28.8	23.8	36.5	26.5	23.9	36.0	27.3	27.0	27.6	13.6	
Progression Factor	1.00	1.00	1.00	0.98	0.52	1.01	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	12.2	1.1	0.2	0.9	0.9	0.4	79.7	0.4	
Delay (s)	51.8	33.3	23.8	47.9	14.7	24.3	36.8	28.2	27.4	107.2	14.0	
Level of Service	D	C	C	D	B	C	D	C	C	F	B	
Approach Delay (s)		34.2			23.7			30.2			89.2	
Approach LOS		C			C			C			F	
Intersection Summary												
HCM Average Control Delay		43.3			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		71.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	1023	146	371	961	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	1077	154	391	1012	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	226	0	117	227	0	0	206
Lane Group Flow (vph)	245	1077	51	391	1012	151	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.2	26.0	26.0	11.5	25.3	25.3	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.7	26.5	26.5	12.0	25.8	25.8	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	1684	524	515	1141	511	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.21		0.11	c0.29		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.10			0.03			0.03
v/c Ratio	0.87	0.64	0.10	0.76	0.89	0.30	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	22.7	18.5	32.6	25.7	20.3	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.77	0.73	1.09	0.71	0.64	0.44	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.4	0.8	0.2	4.6	7.7	1.1	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	37.7	17.4	20.3	27.7	24.2	10.1	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	C	C	C	B	D	C	C	D	D	C
Approach Delay (s)		21.1			22.0			32.5			35.9	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.0			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↓	↑↑	↑		↓		↓	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Flt		0.95		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4837		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4837		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1219	590	68	1329	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1283	621	72	1399	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	103	0	0	0	0	0	12	0	0	0	21
Lane Group Flow (vph)	0	1801	0	72	1399	209	0	13	0	370	370	348
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2171		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.37		0.04	c0.40							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.22
v/c Ratio		0.83		0.62	0.70	0.13		0.03		0.84	0.88	0.66
Uniform Delay, d1		19.4		36.4	12.5	0.0		17.8		24.6	25.1	22.7
Progression Factor		0.32		1.26	0.73	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		2.9		6.6	1.5	0.1		0.0		13.7	18.9	2.9
Delay (s)		9.1		52.5	10.6	0.1		17.9		38.4	44.0	25.6
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.1			11.1			17.9			36.0	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.2				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		76.7%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑		↑	↑		↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	0.86		1.00	0.91		1.00	0.95		0.95	1.00
Flt		1.00	1.00		0.85	1.00		0.85	1.00		0.85	0.98
Flt Protected		0.95	1.00		1.00	1.00		0.95	1.00		1.00	0.96
Satd. Flow (prot)		1770	6408		1583	5085		1583	1770		1504	1748
Flt Permitted		0.95	1.00		1.00	1.00		0.75	1.00		1.00	0.84
Satd. Flow (perm)		1770	6408		1583	5085		1583	1389		1504	1527
Volume (vph)	17	1642	273		997	350		596	0		306	14
Peak-hour factor, PHF	0.95	0.95	0.95		0.95	0.95		0.95	0.95		0.95	0.95
Adj. Flow (vph)	18	1728	287		1049	368		627	0		322	15
RTOR Reduction (vph)	0	0	0		0	0		0	1		1	0
Lane Group Flow (vph)	18	1728	287		1049	368		627	160		160	0
Turn Type				Prot		Free		Free	Perm		Perm	Perm
Protected Phases		7	4			8			2			6
Permitted Phases					Free			Free	2		2	6
Actuated Green, G (s)		2.2	32.9		80.0	26.2		80.0	38.1		38.1	38.1
Effective Green, g (s)		2.7	33.4		80.0	26.7		80.0	38.6		38.6	38.6
Actuated g/C Ratio		0.03	0.42		1.00	0.33		1.00	0.48		0.48	0.48
Clearance Time (s)		4.5	4.5			4.5		4.5	4.5		4.5	4.5
Vehicle Extension (s)		3.0	3.0			3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		60	2675		1583	1697		1583	670		726	737
v/s Ratio Prot		0.01	c0.27			0.21			0.11			
v/s Ratio Perm					0.18			0.23	c0.45		0.11	0.01
v/c Ratio		0.30	0.65		0.18	0.62		0.23	0.94		0.22	0.02
Uniform Delay, d1		37.7	18.6		0.0	22.4		0.0	19.5		12.0	10.8
Progression Factor		1.02	1.04		1.00	0.66		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.5	0.7		0.1	1.3		0.3	20.4		0.2	0.0
Delay (s)		40.1	20.1		0.1	16.1		0.3	39.9		12.1	10.8
Level of Service		D	C		A	B		A	D		B	B
Approach Delay (s)			17.4			12.0			30.5			10.8
Approach LOS			B			B			C			B
Intersection Summary												
HCM Average Control Delay		18.5				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		8.0				
Intersection Capacity Utilization		67.6%				ICU Level of Service		C				
Analysis Period (min)		15										
c Critical Lane Group												
























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1149	545	141	783	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1209	574	148	824	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	38	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1209	179	148	965	0	226	475	47	107	242	29
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.34		0.08	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	1.09	0.36	0.60	0.68		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.1		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.49	0.43	1.38	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	54.1	1.7	4.1	2.6		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	15.6	65.8	31.2	36.5	27.7		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	B	E	C	D	C		D	C	C	C	C	C
Approach Delay (s)		49.3			28.8			32.7			31.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay	38.9			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	71.9%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	162	321	494	108	148	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	171	338	520	114	156	360	231
RTOR Reduction (vph)	0	67	0	0	131	0	0	75	0	0	174	0
Lane Group Flow (vph)	140	655	0	135	620	40	338	520	39	156	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.09	0.19	
v/s Ratio Perm						0.03			0.02			0.04
v/c Ratio	0.92	0.82		0.88	0.75	0.11	0.94	0.81	0.07	0.87	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	20.8	27.3	20.5	15.2	30.7	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.1	33.1	10.4	0.3	34.0	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	20.9	60.4	30.9	15.4	64.7	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	E	D	C
Approach Delay (s)	39.7			33.2			39.4			38.1		
Approach LOS	D			C			D			D		
Intersection Summary												
HCM Average Control Delay	37.6			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	69.3			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	76.0%			ICU Level of Service					D			
Analysis Period (min)	15											
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3515		1770	3539	1583	1770	1660		1770	1649	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3515		1770	3539	1583	1770	1660		1770	1649	
Volume (vph)	102	677	32	53	797	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	713	34	56	839	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	0	128	0	61	0	0	60	0
Lane Group Flow (vph)	107	744	0	56	839	223	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.21		0.03	c0.24		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm						0.14						
v/c Ratio	0.67	0.66		0.58	0.83	0.50	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.4		41.6	30.2	26.8	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.66	0.57	0.20	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.1		7.9	7.3	3.5	22.4	1.0		5.7	0.1	
Delay (s)	50.4	29.4		35.3	24.6	9.0	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		32.1			20.7			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		27.0							C			
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		90.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		73.0%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	819	413	99	959	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	435	104	1009	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	109	0	0	0	0	0	0	0	77	0
Lane Group Flow (vph)	0	862	326	104	1009	0	0	0	0	673	146	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06	c0.29					c0.20	0.09	
v/s Ratio Perm			0.21									
v/c Ratio		0.59	0.50	0.44	0.48					0.61	0.29	
Uniform Delay, d1		20.7	19.7	35.8	10.6					25.7	22.8	
Progression Factor		0.53	0.48	1.28	1.72					1.00	1.00	
Incremental Delay, d2		1.3	2.0	1.2	0.8					1.0	1.4	
Delay (s)		12.4	11.5	47.0	19.1					26.7	24.2	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		12.1			21.7			0.0			26.1	
Approach LOS		B			C			A			C	
Intersection Summary												
HCM Average Control Delay			19.1						B			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)		8.0				
Intersection Capacity Utilization			61.7%			ICU Level of Service		B				
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	410	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	432	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	432	227
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	63.0			63.0	18.0	18.0
Effective Green, g (s)	63.5			63.5	18.5	18.5
Actuated g/C Ratio	0.71			0.71	0.21	0.21
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2497			2497	706	325
v/s Ratio Prot	c0.43			0.18	0.13	
v/s Ratio Perm					c0.14	
v/c Ratio	0.62			0.26	0.61	0.70
Uniform Delay, d1	6.9			4.8	32.5	33.2
Progression Factor	0.32			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	1.6	6.4
Delay (s)	3.2			5.0	34.1	39.6
Level of Service	A			A	C	D
Approach Delay (s)	3.2			5.0	36.1	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay	11.4				HCM Level of Service	B
HCM Volume to Capacity ratio	0.63					
Actuated Cycle Length (s)	90.0				Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.7%				ICU Level of Service	B
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↑	↗	↖	↖	↕
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	8	5	10	1	6	221	19	793	17	113	668	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	5	11	1	6	233	20	835	18	119	703	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1520	1836	354	1477	1820	417	707			853		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1520	1836	354	1477	1820	417	707			853		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	92	98	98	90	60	98			85		
cM capacity (veh/h)	39	62	643	70	64	584	887			782		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	24	240	20	417	417	18	119	469	239			
Volume Left	8	1	20	0	0	0	119	0	0			
Volume Right	11	233	0	0	0	18	0	0	4			
cSH	77	603	887	1700	1700	1700	782	1700	1700			
Volume to Capacity	0.31	0.40	0.02	0.25	0.25	0.01	0.15	0.28	0.14			
Queue Length 95th (ft)	29	48	2	0	0	0	13	0	0			
Control Delay (s)	72.0	16.8	9.2	0.0	0.0	0.0	10.4	0.0	0.0			
Lane LOS	F	C	A				B					
Approach Delay (s)	72.0	16.8	0.2				1.5					
Approach LOS	F	C										
Intersection Summary												
Average Delay				3.7								
Intersection Capacity Utilization			48.9%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	134	3	3	226	2	1	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	141	3	3	238	2	1	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	240			144			391	391	143	391	392	239
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	240			144			391	391	143	391	392	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1327			1438			566	543	905	566	543	800
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	145	243	2	1								
Volume Left	1	3	1	0								
Volume Right	3	2	1	0								
cSH	1327	1438	697	543								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.1	10.2	11.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.2	11.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	119	2	4	235	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	125	2	4	247	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	256			127			389	393	126	393	389	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	256			127			389	393	126	393	389	252
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1309			1459			567	541	924	557	544	787
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	128	260	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1309	1459	544	592								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.1	11.7	11.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	11.7	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		25.4%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↙	↘
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	150	5	2	287	14	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	5	2	302	15	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			163		467	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		467	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1415		553	885
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	163	304	21			
Volume Left	0	2	15			
Volume Right	5	0	6			
cSH	1700	1415	623			
Volume to Capacity	0.10	0.00	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.1	11.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		26.7%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↖			↖			↖	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	4	10	252	0	38	0	11	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	4	11	265	0	40	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	265			167			452	452	165	463	454	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			167			452	452	165	463	454	265
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			92	100	99	100	100	100
cM capacity (veh/h)	1299			1410			515	500	879	499	498	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	167	276	52	0								
Volume Left	0	11	40	0								
Volume Right	4	0	12	0								
cSH	1299	1410	568	1700								
Volume to Capacity	0.00	0.01	0.09	0.00								
Queue Length 95th (ft)	0	1	7	0								
Control Delay (s)	0.0	0.4	12.0	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	12.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization		31.4%		ICU Level of Service	A							
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	143	20	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	151	21	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1405		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	247	34			
Volume Left	0	0	34			
Volume Right	21	0	0			
cSH	1700	1405	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	↖	←	↗	↘	↑	↖	↗	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	841	189	819	569	181	162	281	447	244
v/c Ratio	1.49	0.33	1.37	0.80	0.85	0.56	0.72	0.74	0.95
Control Delay	270.0	31.6	209.1	28.6	101.7	77.7	18.3	68.0	102.8
Queue Delay	69.7	4.9	100.6	21.4	0.0	0.0	0.5	5.5	0.0
Total Delay	339.6	36.5	309.7	50.0	101.7	77.7	18.8	73.5	102.8
Queue Length 50th (ft)	~1229	124	~1214	274	188	87	0	230	237
Queue Length 95th (ft)	#1490	m165n#1402	m353	#317	126	97	#318	#419	
Internal Link Dist (ft)	550	220			110			270	
Turn Bay Length (ft)				150		100	275		
Base Capacity (vph)	563	567	597	707	221	376	419	601	257
Starvation Cap Reductn	0	308	84	146	0	0	0	0	0
Spillback Cap Reductn	53	0	0	0	0	0	19	103	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.65	0.73	1.60	1.01	0.82	0.43	0.70	0.90	0.95
Intersection Summary									
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↖	→	↗	↖	←	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	145	5	200	173	159	5	32	254
v/c Ratio	0.04	0.16	0.49	0.04	0.46	0.59	0.06	0.00	0.20	0.13
Control Delay	34.4	33.2	11.9	29.4	18.1	35.7	4.0	3.4	35.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	33.2	11.9	29.4	18.1	35.7	4.0	3.4	35.8	11.2
Queue Length 50th (ft)	2	15	0	2	7	107	3	0	15	26
Queue Length 95th (ft)	13	38	48	m4	m43	m107	m38	m1	40	74
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	487	155	854	400	2485	1113	184	1946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.06	0.00	0.17	0.13
Intersection Summary										
m	Volume for 95th percentile queue is metered by upstream signal.									

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	857	586	98	926	344	996
v/c Ratio	0.51	0.66	0.38	0.46	0.66	1.13dr
Control Delay	17.8	15.4	52.3	20.7	30.3	37.7
Queue Delay	3.8	12.5	0.0	0.2	0.0	28.4
Total Delay	21.6	27.9	52.3	20.8	30.3	66.0
Queue Length 50th (ft)	187	189	27	194	160	230
Queue Length 95th (ft)	m185	m177	m30	m183	261	#363
Internal Link Dist (ft)	220		466		348	
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	889	257	2035	523	1082
Starvation Cap Reductn	717	283	0	0	0	0
Spillback Cap Reductn	0	0	0	333	0	139
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.97	0.38	0.54	0.66	1.06

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	525	677	431	443	393	414	602	44	52
v/c Ratio	0.43	0.76	0.84	0.29	1.13	1.18	0.57	0.12	0.14
Control Delay	23.7	14.8	61.4	22.2	105.3	121.5	3.2	29.9	25.6
Queue Delay	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	17.5	61.4	22.2	105.3	121.5	3.2	29.9	25.6
Queue Length 50th (ft)	88	118	120	100	~227	~248	0	22	23
Queue Length 95th (ft)	124	343	#191	136	m#284	m#304	m20	44	45
Internal Link Dist (ft)	466		345		380				270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1208	892	515	1534	347	352	1053	365	381
Starvation Cap Reductn	0	118	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.87	0.84	0.29	1.13	1.18	0.57	0.12	0.14

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	197	975	683	98	228
v/c Ratio	0.45	0.43	0.42	0.21	0.39
Control Delay	28.1	9.0	15.7	24.5	5.8
Queue Delay	0.0	0.2	0.0	0.0	0.0
Total Delay	28.1	9.2	15.7	24.5	5.8
Queue Length 50th (ft)	53	198	114	38	0
Queue Length 95th (ft)	77	231	168	77	51
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1619	465	584
Starvation Cap Reductn	0	555	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.57	0.42	0.21	0.39
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	452	454	42	16	541	502	7	429	715
v/c Ratio	1.02	1.02	0.09	0.11	1.02	0.25	0.05	0.47	0.78
Control Delay	81.3	81.2	8.3	29.3	74.3	10.7	41.9	26.9	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Total Delay	81.3	81.2	8.3	29.3	74.3	10.7	41.9	26.9	14.0
Queue Length 50th (ft)	~247	~249	0	5	~278	48	4	111	175
Queue Length 95th (ft)	#442	#443	23	23	#478	142	m4	m#177	#287
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2044	177	912	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	49
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.02	0.09	0.09	1.02	0.25	0.04	0.47	0.83
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	301	637	264	223	498
v/c Ratio	0.70	0.52	0.79	0.32	0.80	0.41
Control Delay	32.9	6.5	25.6	3.0	50.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	6.5	25.6	3.0	50.2	6.8
Queue Length 50th (ft)	96	0	211	0	86	82
Queue Length 95th (ft)	168	54	#394	38	#194	139
Internal Link Dist (ft)	480		3920		2550	
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	617	805	834	281	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.49	0.79	0.32	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	632	38	213	605	483	67	97	85	623	149
v/c Ratio	0.40	0.86	0.11	0.83	0.66	0.63	0.26	0.24	0.22	1.17	0.18
Control Delay	44.6	43.6	9.9	54.1	17.5	5.5	37.7	11.2	8.0	125.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	43.6	9.9	54.1	17.5	5.5	37.7	11.2	8.0	125.2	5.7
Queue Length 50th (ft)	26	160	0	43	75	0	16	8	0	~378	13
Queue Length 95th (ft)	61	#245	23	m#62	m124	m3	36	48	36	#573	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	915	767	257	398	393	531	833
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.84	0.10	0.83	0.66	0.63	0.26	0.24	0.22	1.17	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	1077	154	391	1012	377	144	435	274	383	278	256
v/c Ratio	0.87	0.64	0.25	0.76	0.89	0.51	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	43.3	17.6	4.6	31.5	25.9	3.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	17.6	4.6	31.5	25.9	3.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	87	131	11	100	255	26	71	74	0	95	129	0
Queue Length 95th (ft)	m109	m130	m14	#154	#364	36	#157	118	65	#188	#230	58
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1142	737	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.64	0.25	0.76	0.89	0.51	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1904	72	1399	209	25	370	370	369
v/c Ratio	0.82	0.51	0.70	0.13	0.05	0.84	0.88	0.67
Control Delay	9.3	54.8	11.2	0.1	9.8	43.2	48.5	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	54.8	11.2	0.1	9.8	43.2	48.5	27.0
Queue Length 50th (ft)	121	38	150	0	2	169	172	136
Queue Length 95th (ft)	#415	m56	m173	m0	18	#318	#329	228
Internal Link Dist (ft)	520	960		428		378		
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2326	142	2000	1583	568	475	455	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.51	0.70	0.13	0.04	0.78	0.81	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1728	287	1049	368	627	161	161	18
v/c Ratio	0.14	0.65	0.18	0.56	0.23	0.93	0.22	0.22	0.02
Control Delay	36.9	21.1	0.1	16.2	0.3	42.0	11.7	11.7	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	21.1	0.1	16.2	0.3	42.0	11.7	11.7	8.3
Queue Length 50th (ft)	10	247	0	94	0	254	42	42	3
Queue Length 95th (ft)	m12	m273	m0	131	m0	#473	76	76	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2672	1583	1866	1583	730	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.65	0.18	0.56	0.23	0.86	0.20	0.20	0.02
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1209	574	148	1003	226	475	236	107	242	193
v/c Ratio	0.51	1.09	0.64	0.60	0.68	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	17.9	71.4	6.4	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	71.4	8.2	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	34	~373	25	69	154	114	120	0	54	62	0
Queue Length 95th (ft)	69	#487	90	#187	#252	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1107	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	171	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.09	0.80	0.60	0.68	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	171	338	520	114	156	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.34	0.95	0.81	0.18	0.87	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	76.0	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	76.0	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	68	146	0
Queue Length 95th (ft)	#162	#221	#155	184	43	#296	#358	30	#169	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	514	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.33	0.95	0.81	0.18	0.87	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	107	747	56	839	351	51	91	511	132		
v/c Ratio	0.67	0.61	0.47	0.78	0.58	0.43	0.44	0.80	0.18		
Control Delay	64.2	29.9	39.0	24.2	6.6	52.2	21.8	35.9	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.2	29.9	39.0	24.2	6.6	52.2	21.8	35.9	5.8		
Queue Length 50th (ft)	61	205	32	251	4	28	14	237	10		
Queue Length 95th (ft)	#161	#299	m63	#356	19	65	57	#388	43		
Internal Link Dist (ft)		6630		350			200		236		
Turn Bay Length (ft)	225		150		80	50		225			
Base Capacity (vph)	159	1232	118	1077	607	118	367	653	782		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.67	0.61	0.47	0.78	0.58	0.43	0.25	0.78	0.17		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	435	104	1009	673	223
v/c Ratio	0.58	0.56	0.40	0.48	0.61	0.38
Control Delay	12.8	8.2	47.7	19.4	28.6	13.6
Queue Delay	0.2	0.3	0.0	0.3	0.0	0.0
Total Delay	13.0	8.5	47.7	19.7	28.6	13.6
Queue Length 50th (ft)	124	65	58	241	164	45
Queue Length 95th (ft)	153	m101	m104	301	222	105
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	772	295	2084	1106	587
Starvation Cap Reductn	140	67	0	491	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.62	0.35	0.63	0.61	0.38
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	432	248
v/c Ratio	0.62	0.26	0.61	0.71
Control Delay	3.6	5.8	35.5	40.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	5.8	35.5	40.6
Queue Length 50th (ft)	0	58	116	119
Queue Length 95th (ft)	243	112	144	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2495	2495	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.35	0.43
Intersection Summary				

**CUMULATIVE 2020 + ALTERNATIVE A
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	17	145	23	153	14	740	203	214	522	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	13	18	153	24	161	15	779	214	225	549	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1904	2025	553	1939	1922	886	556			993		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1904	2025	553	1939	1922	886	556			993		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	67	97	0	46	53	99			68		
cM capacity (veh/h)	12	38	533	27	45	344	1015			697		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	338	15	993	225	556						
Volume Left	0	153	15	0	225	0						
Volume Right	18	161	0	214	0	6						
cSH	84	50	1015	1700	697	1700						
Volume to Capacity	0.36	6.70	0.01	0.58	0.32	0.33						
Queue Length 95th (ft)	35	Err	1	0	35	0						
Control Delay (s)	70.1	Err	8.6	0.0	12.6	0.0						
Lane LOS	F	F	A		B							
Approach Delay (s)	70.1	Err	0.1		3.6							
Approach LOS	F	F										
Intersection Summary												
Average Delay		1568.8										
Intersection Capacity Utilization		89.1%		ICU Level of Service		E						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	384	20	8	302	10	10	10	10	9	9	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	404	21	8	318	11	11	11	11	9	9	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	328			425			823	813	415	823	818	323
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	328			425			823	813	415	823	818	323
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			96	97	98	97	97	99
cM capacity (veh/h)	1231			1134			275	304	638	274	302	718
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	452	337	32	29								
Volume Left	26	8	11	9								
Volume Right	21	11	11	11								
cSH	1231	1134	353	365								
Volume to Capacity	0.02	0.01	0.09	0.08								
Queue Length 95th (ft)	2	1	7	7								
Control Delay (s)	0.7	0.3	16.2	15.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	0.3	16.2	15.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay		1.6										
Intersection Capacity Utilization		43.5%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	381	11	11	302	25	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	401	12	12	318	26	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	344			413			800	797	407	800	790	331
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	344			413			800	797	407	800	790	331
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	98	96	97	99
cM capacity (veh/h)	1215			1146			287	313	644	286	316	711
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	424	356	32	32								
Volume Left	12	12	11	11								
Volume Right	12	26	11	11								
cSH	1215	1146	364	372								
Volume to Capacity	0.01	0.01	0.09	0.08								
Queue Length 95th (ft)	1	1	7	7								
Control Delay (s)	0.3	0.4	15.8	15.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.4	15.8	15.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization		35.3%		ICU Level of Service		A						
Analysis Period (min)		15										



















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	44	196	160	195	205	32	116	19	158	23	10	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	206	168	205	216	34	122	20	166	24	11	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	249			375			1033	1043	291	1186	1094	216
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			375			1033	1043	291	1186	1094	216
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			83			27	89	78	76	94	98
cM capacity (veh/h)	1316			1184			166	183	749	100	171	824
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	421	205	216	34	308	53						
Volume Left	46	205	0	0	122	24						
Volume Right	168	0	0	34	166	18						
cSH	1316	1184	1700	1700	289	162						
Volume to Capacity	0.04	0.17	0.13	0.02	1.07	0.33						
Queue Length 95th (ft)	3	16	0	0	300	33						
Control Delay (s)	1.2	8.7	0.0	0.0	111.1	37.7						
Lane LOS	A	A			F	E						
Approach Delay (s)	1.2	3.9			111.1	37.7						
Approach LOS					F	E						
Intersection Summary												
Average Delay			31.1									
Intersection Capacity Utilization		64.0%		ICU Level of Service		B						
Analysis Period (min)		15										



















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	20	288	69	653	373	75	55	31	695	65	11	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	303	73	687	393	79	58	33	732	68	12	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	472			376			1963	2228	188	2748	2225	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	472			376			1963	2228	188	2748	2225	236
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			42			0	0	11	0	34	99
cM capacity (veh/h)	1087			1179			10	17	822	0	17	766
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	21	202	174	687	262	210	822	84				
Volume Left	21	0	0	687	0	0	58	68				
Volume Right	0	0	73	0	0	79	732	4				
cSH	1087	1700	1700	1179	1700	1700	96	0				
Volume to Capacity	0.02	0.12	0.10	0.58	0.15	0.12	8.53	Err				
Queue Length 95th (ft)	1	0	0	98	0	0	Err	Err				
Control Delay (s)	8.4	0.0	0.0	12.2	0.0	0.0	Err	Err				
Lane LOS	A			B			F	F				
Approach Delay (s)	0.4			7.3			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	102.8%			ICU Level of Service			G					
Analysis Period (min)	15											

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	23	843	182	327	956	98	98	67	352	76	15	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	887	192	344	1006	103	103	71	371	80	16	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)	630											
pX, platoon unblocked												
vC, conflicting volume	1109			1079			2279	2829	539	2644	2874	555
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1109			1079			2279	2829	539	2644	2874	555
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			46			0	0	24	0	0	90
cM capacity (veh/h)	625			642			0	8	486	0	7	475
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	24	592	487	344	671	439	544	144				
Volume Left	24	0	0	344	0	0	103	80				
Volume Right	0	0	192	0	0	103	371	48				
cSH	625	1700	1700	642	1700	1700	0	0				
Volume to Capacity	0.04	0.35	0.29	0.54	0.39	0.26	Err	Err				
Queue Length 95th (ft)	3	0	0	80	0	0	Err	Err				
Control Delay (s)	11.0	0.0	0.0	16.9	0.0	0.0	Err	Err				
Lane LOS	B			C			F	F				
Approach Delay (s)	0.2			4.0			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization	88.3%			ICU Level of Service					E			
Analysis Period (min)	15											

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1702	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1702	
Volume (vph)	79	1038	156	235	1127	529	184	40	350	553	52	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	1093	164	247	1186	557	194	42	368	582	55	75
RTOR Reduction (vph)	0	0	43	0	0	116	0	0	345	0	31	0
Lane Group Flow (vph)	83	1093	121	247	1186	441	194	42	23	582	99	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4		8			2				
Actuated Green, G (s)	47.5	47.5	47.5	53.5	53.5	53.5	19.0	9.5	9.5	31.5	22.0	
Effective Green, g (s)	48.0	48.0	48.0	54.0	54.0	54.0	19.5	10.0	10.0	32.0	22.5	
Actuated g/C Ratio	0.30	0.30	0.30	0.34	0.34	0.34	0.12	0.06	0.06	0.20	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	531	1017	432	567	597	534	216	221	99	687	239	
v/s Ratio Prot	0.05	c0.32		0.15	c0.67		c0.11	0.01		c0.17	0.06	
v/s Ratio Perm			0.08			0.28			0.01			
v/c Ratio	0.16	1.07	0.28	0.44	1.99	0.83	0.90	0.19	0.23	0.85	0.41	
Uniform Delay, d1	41.1	56.0	42.8	41.2	53.0	48.7	69.3	71.2	71.3	61.6	62.7	
Progression Factor	1.00	1.00	1.00	0.84	0.85	0.85	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	50.6	0.4	1.4	447.4	8.2	34.5	0.4	1.2	9.5	1.2	
Delay (s)	41.3	106.6	43.2	35.8	492.6	49.4	103.8	71.6	72.6	71.1	63.9	
Level of Service	D	F	D	D	F	D	F	E	E	E	E	
Approach Delay (s)		94.8			311.9			82.5			69.8	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM Average Control Delay		182.3										
HCM Volume to Capacity ratio		1.33										
Actuated Cycle Length (s)		160.0										
Intersection Capacity Utilization		122.1%										
Analysis Period (min)		15										
c Critical Lane Group												

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Flt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3037	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3037	
Volume (vph)	0	1276	663	85	1123	0	0	0	0	424	339	769
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1343	698	89	1182	0	0	0	0	446	357	809
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	47	0
Lane Group Flow (vph)	0	1343	561	89	1182	0	0	0	0	446	1119	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases			4									
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	987	
v/s Ratio Prot		c0.38		0.03	c0.33							
v/s Ratio Perm			0.35							0.28	0.37	
v/c Ratio		0.82	0.76	0.42	0.58					0.85	1.51dr	
Uniform Delay, d1		18.5	17.8	36.2	10.8					25.2	27.0	
Progression Factor		1.42	1.79	1.25	1.89					1.00	1.00	
Incremental Delay, d2		1.4	2.3	0.6	0.5					16.0	72.8	
Delay (s)		27.8	34.1	45.7	21.0					41.3	99.8	
Level of Service		C	C	D	C					D	F	
Approach Delay (s)		30.0			22.7				0.0		83.6	
Approach LOS		C			C				A		F	
Intersection Summary												
HCM Average Control Delay		45.7								D		
HCM Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		80.0								8.0		
Intersection Capacity Utilization		85.3%								E		
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖↖	↖↖	↖	↖	↖	↖↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.95	0.95	0.95	0.95	0.95	0.88	1.00	1.00	
Frt	1.00	0.85	1.00	0.99	1.00	1.00	0.85	1.00	0.93			
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00		
Satd. Flow (prot)	5085	1583	3433	3518	1681	1689	2787	1770	1723			
Flt Permitted	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95	1.00			
Satd. Flow (perm)	5085	1583	3433	3518	1681	1689	2787	1770	1723			
Volume (vph)	0	819	882	178	411	17	788	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	928	187	433	18	829	19	601	9	9	9
RTOR Reduction (vph)	0	0	638	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	862	290	187	448	0	415	433	124	9	11	0
Turn Type	Prot	Perm	Prot			Split		Perm	Split			
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	18.5	18.5	11.5	34.5		16.0	16.0	16.0	16.0	16.0		
Effective Green, g (s)	19.0	19.0	12.0	35.0		16.5	16.5	16.5	16.5	16.5		
Actuated g/C Ratio	0.24	0.24	0.15	0.44		0.21	0.21	0.21	0.21	0.21		
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1208	376	515	1539		347	348	575	365	355		
v/s Ratio Prot	0.17		c0.05	0.13		0.25	c0.26		0.01	c0.01		
v/s Ratio Perm		c0.18						0.04				
v/c Ratio	0.71	0.77	0.36	0.29		1.20	1.24	0.22	0.02	0.03		
Uniform Delay, d1	28.0	28.5	30.6	14.5		31.8	31.8	26.4	25.3	25.4		
Progression Factor	1.42	5.82	1.21	1.23		1.03	1.03	2.34	1.00	1.00		
Incremental Delay, d2	2.0	8.3	0.4	0.4		104.4	124.1	0.5	0.1	0.2		
Delay (s)	41.8	174.1	37.2	18.2		137.0	156.6	62.2	25.5	25.5		
Level of Service	D	F	D	B		F	F	E	C	C		
Approach Delay (s)	110.4			23.8			111.8			25.5		
Approach LOS	F			C			F			C		
Intersection Summary												
HCM Average Control Delay		96.2				HCM Level of Service		F				
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		73.0%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↖	→	↗	↖	↖	↖
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖↖	↖↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	180	1218	770	57	137	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	1282	811	60	144	96
RTOR Reduction (vph)	0	0	5	0	0	71
Lane Group Flow (vph)	189	1282	866	0	144	25
Turn Type	Prot				Perm	
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	9.6	50.5	36.4		20.5	20.5
Effective Green, g (s)	10.1	51.0	36.9		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	433	2256	1616		465	416
v/s Ratio Prot	0.06	c0.36	0.25		c0.08	
v/s Ratio Perm						0.02
v/c Ratio	0.44	0.57	0.54		0.31	0.06
Uniform Delay, d1	32.3	8.2	15.4		23.7	22.1
Progression Factor	0.80	2.32	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.8	1.3		1.7	0.3
Delay (s)	26.5	19.9	16.7		25.4	22.4
Level of Service	C	B	B		C	C
Approach Delay (s)		20.8	16.7		24.2	
Approach LOS		C	B		C	
Intersection Summary						
HCM Average Control Delay		19.7			HCM Level of Service	B
HCM Volume to Capacity ratio		0.49				
Actuated Cycle Length (s)		80.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		47.9%			ICU Level of Service	A
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↲	↰	↱	↲	↰	↱	↲	↰	↱	↲
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1745		1770	3527		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1745		1770	3527		1770	3539	1583
Volume (vph)	884	5	108	15	6	9	557	483	11	9	394	667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	931	5	114	16	6	9	586	508	12	9	415	702
RTOR Reduction (vph)	0	0	84	0	9	0	0	2	0	0	0	570
Lane Group Flow (vph)	466	470	30	0	22	0	586	518	0	9	415	132
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.5	20.5	20.5		3.0		27.1	37.0		1.5	11.4	11.4
Effective Green, g (s)	21.0	21.0	21.0		3.5		27.6	37.5		2.0	11.9	11.9
Actuated g/C Ratio	0.26	0.26	0.26		0.04		0.35	0.47		0.02	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	441	443	416		76		611	1653		44	526	235
v/s Ratio Prot	0.28	c0.28			c0.01		c0.33	0.15		0.01	c0.12	
v/s Ratio Perm			0.02									0.08
v/c Ratio	1.06	1.06	0.07		0.29		0.96	0.31		0.20	0.79	0.56
Uniform Delay, d1	29.5	29.5	22.2		37.1		25.6	13.2		38.2	32.8	31.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.06	1.14	3.27
Incremental Delay, d2	58.6	59.8	0.1		2.2		26.2	0.5		1.3	6.6	5.2
Delay (s)	88.1	89.3	22.2		39.2		51.9	13.7		41.7	44.0	108.6
Level of Service	F	F	C		D		D	B		D	D	F
Approach Delay (s)		81.5			39.2			33.9			84.3	
Approach LOS		F			D			C			F	
Intersection Summary												
HCM Average Control Delay		66.2			HCM Level of Service			E				
HCM Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		85.5%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↰	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	961	0	0	684
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	1012	0	0	720
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1732	1012			1012	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1732	1012			1012	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	97	291			685	
Direction, Lane #						
Volume Total	0	1012	720			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.60	0.42			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		53.9%			ICU Level of Service	A
Analysis Period (min)		15				

14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	305	73	45	0	0	322
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	321	77	47	0	0	339
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	47				766	47
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	47				766	47
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				100	67
cM capacity (veh/h)	1560				294	1022
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	398	47	339			
Volume Left	321	0	0			
Volume Right	0	0	339			
cSH	1560	1700	1022			
Volume to Capacity	0.21	0.03	0.33			
Queue Length 95th (ft)	19	0	37			
Control Delay (s)	6.7	0.0	10.3			
Lane LOS	A		B			
Approach Delay (s)	6.7	0.0	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			7.8			
Intersection Capacity Utilization			54.0%		ICU Level of Service	A
Analysis Period (min)			15			

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	197	32	13	429	373	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	207	34	14	452	393	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	663	213	426			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	663	213	426			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	47	96	99			
cM capacity (veh/h)	390	792	1129			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	207	34	14	226	226	262 165
Volume Left	207	0	14	0	0	0 0
Volume Right	0	34	0	0	0	0 34
cSH	390	792	1129	1700	1700	1700 1700
Volume to Capacity	0.53	0.04	0.01	0.13	0.13	0.15 0.10
Queue Length 95th (ft)	75	3	1	0	0	0 0
Control Delay (s)	24.3	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	22.2		0.2			0.0
Approach LOS	C					
Intersection Summary						
Average Delay				4.8		
Intersection Capacity Utilization				29.4%		ICU Level of Service A
Analysis Period (min)				15		

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	↖	↗	↖	↗	↖	↗
Lane Configurations	↖	↗	↖	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	299	372	589	285	228	463
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	315	392	620	300	240	487
RTOR Reduction (vph)	0	302	0	173	0	0
Lane Group Flow (vph)	315	90	620	127	240	487
Turn Type	Perm		Perm	Prot		
Protected Phases	8		2	1	6	
Permitted Phases	8		2			
Actuated Green, G (s)	14.2	14.2	26.5	26.5	9.5	40.5
Effective Green, g (s)	14.7	14.7	27.0	27.0	10.0	41.0
Actuated g/C Ratio	0.23	0.23	0.42	0.42	0.16	0.64
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	408	365	790	671	278	1199
v/s Ratio Prot	c0.18		c0.33		c0.14	0.26
v/s Ratio Perm		0.06		0.08		
v/c Ratio	0.77	0.25	0.78	0.19	0.86	0.41
Uniform Delay, d1	22.9	20.0	15.8	11.5	26.2	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8	0.4	7.7	0.6	23.1	1.0
Delay (s)	31.7	20.3	23.5	12.1	49.3	6.5
Level of Service	C	C	C	B	D	A
Approach Delay (s)	25.4		19.8		20.6	
Approach LOS	C		B		C	
Intersection Summary						
HCM Average Control Delay		21.7		HCM Level of Service	C	
HCM Volume to Capacity ratio		0.80				
Actuated Cycle Length (s)		63.7		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		70.2%		ICU Level of Service	C	
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	
Volume (vph)	58	539	45	122	584	410	69	17	123	570	48	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	567	47	128	615	432	73	18	129	600	51	109
RTOR Reduction (vph)	0	0	37	0	0	342	0	47	54	0	58	0
Lane Group Flow (vph)	61	567	10	128	615	90	73	31	15	600	102	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	16.1	16.1	4.4	16.1	16.1	4.4	17.1	17.1	24.4	37.1	
Effective Green, g (s)	4.9	16.6	16.6	4.9	16.6	16.6	4.9	17.6	17.6	24.9	37.6	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.22	0.22	0.31	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	734	328	210	734	328	210	344	331	551	786	
v/s Ratio Prot	0.03	c0.16		0.04	c0.17		c0.02	0.02		c0.34	c0.06	
v/s Ratio Perm			0.01			0.06			0.01			
v/c Ratio	0.56	0.77	0.03	0.61	0.84	0.27	0.35	0.09	0.05	1.09	0.13	
Uniform Delay, d1	36.5	29.9	25.3	36.6	30.4	26.6	36.0	24.8	24.6	27.6	12.0	
Progression Factor	1.00	1.00	1.00	0.92	0.48	0.82	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	5.1	0.0	3.8	6.4	0.3	1.0	0.5	0.3	64.7	0.3	
Delay (s)	43.1	35.0	25.3	37.4	21.1	22.3	37.0	25.4	24.8	92.3	12.3	
Level of Service	D	C	C	D	C	C	D	C	C	F	B	
Approach Delay (s)		35.0			23.3			29.1			75.5	
Approach LOS		D			C			C			E	
Intersection Summary												
HCM Average Control Delay		40.6		HCM Level of Service	D							
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		16.0						
Intersection Capacity Utilization		67.7%		ICU Level of Service	C							
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3146	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3146	1441	3433	1863	1583
Volume (vph)	209	905	118	448	766	408	122	228	464	439	210	228
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	220	953	124	472	806	429	128	240	488	462	221	240
RTOR Reduction (vph)	0	0	84	0	0	285	0	187	224	0	0	197
Lane Group Flow (vph)	220	953	40	472	806	144	128	275	42	462	221	43
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	25.5	25.5	11.5	25.0	25.0	11.3	12.2	12.2	12.8	13.7	13.7
Effective Green, g (s)	12.5	26.0	26.0	12.0	25.5	25.5	11.8	12.7	12.7	13.3	14.2	14.2
Actuated g/C Ratio	0.16	0.32	0.32	0.15	0.32	0.32	0.15	0.16	0.16	0.17	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	1653	514	515	1128	505	261	499	229	571	331	281
v/s Ratio Prot	c0.12	0.19		c0.14	c0.23		0.07	0.09		c0.13	c0.12	
v/s Ratio Perm			0.03			0.09			0.03			0.03
v/c Ratio	0.79	0.58	0.08	0.92	0.71	0.28	0.49	0.55	0.18	0.81	0.67	0.15
Uniform Delay, d1	32.5	22.4	18.7	33.5	24.0	20.4	31.3	31.0	29.2	32.1	30.7	27.8
Progression Factor	0.72	0.76	1.17	0.71	0.60	0.69	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.7	0.1	16.9	2.9	1.1	1.5	1.3	0.4	8.3	5.0	0.3
Delay (s)	30.5	17.8	22.1	40.8	17.3	15.2	32.8	32.3	29.6	40.4	35.7	28.1
Level of Service	C	B	C	D	B	B	C	C	C	D	D	C
Approach Delay (s)		20.3			23.3			31.5			36.1	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.4			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		69.9%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												
























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0				4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00				1.00	0.95	0.95
Frt		0.95		1.00	1.00	0.85				0.90	1.00	1.00
Flt Protected		1.00		0.95	1.00	1.00				0.99	0.95	0.95
Satd. Flow (prot)		4816		1770	3539	1583				1653	1681	1583
Flt Permitted		1.00		0.95	1.00	1.00				0.92	0.74	0.74
Satd. Flow (perm)		4816		1770	3539	1583				1541	1312	1312
Volume (vph)	0	1169	639	78	1293	234	6	0	17	692	0	323
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1231	673	82	1361	246	6	0	18	728	0	340
RTOR Reduction (vph)	0	114	0	0	0	0	0	0	12	0	0	24
Lane Group Flow (vph)	0	1790	0	82	1361	246	0	12	0	364	364	316
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)		36.1		4.9	45.5	80.0		25.5		25.5	25.5	25.5
Effective Green, g (s)		36.6		5.4	46.0	80.0		26.0		26.0	26.0	26.0
Actuated g/C Ratio		0.46		0.07	0.58	1.00		0.32		0.32	0.32	0.32
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2203		119	2035	1583		501		426	426	514
v/s Ratio Prot		c0.37		0.05	c0.38							
v/s Ratio Perm						0.16		0.01		c0.28	0.28	0.20
v/c Ratio		0.81		0.69	0.67	0.16		0.02		0.85	0.85	0.61
Uniform Delay, d1		18.7		36.5	11.7	0.0		18.4		25.2	25.2	22.8
Progression Factor		0.40		1.25	0.70	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		2.6		10.8	1.2	0.1		0.0		15.3	15.3	2.2
Delay (s)		10.0		56.4	9.4	0.1		18.4		40.5	40.5	25.0
Level of Service		B		E	A	A		B		D	D	C
Approach Delay (s)		10.0			10.4			18.4			35.6	
Approach LOS		B			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.0			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		77.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	
Flt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.83	
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1509	
Volume (vph)	19	1356	504	0	988	343	614	0	376	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1427	531	0	1040	361	646	0	396	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	3	0	2	0
Lane Group Flow (vph)	20	1427	531	0	1040	361	646	195	195	0	16	0
Turn Type	Prot		Free			Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases			Free			Free	2		2	6		
Actuated Green, G (s)	2.2	32.1	80.0		25.4	80.0	38.9	38.9	38.9		38.9	
Effective Green, g (s)	2.7	32.6	80.0		25.9	80.0	39.4	39.4	39.4		39.4	
Actuated g/C Ratio	0.03	0.41	1.00		0.32	1.00	0.49	0.49	0.49		0.49	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	2611	1583		1646	1583	684	741	741		743	
v/s Ratio Prot	0.01	c0.22			c0.20			0.13				
v/s Ratio Perm			0.34			0.23	c0.47		0.13		0.01	
v/c Ratio	0.33	0.55	0.34		0.63	0.23	0.94	0.26	0.26		0.02	
Uniform Delay, d1	37.8	18.1	0.0		23.0	0.0	19.3	11.8	11.8		10.4	
Progression Factor	1.02	1.02	1.00		0.70	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.8	0.5	0.3		1.2	0.2	21.7	0.2	0.2		0.0	
Delay (s)	40.3	18.8	0.3		17.3	0.2	40.9	12.0	12.0		10.4	
Level of Service	D	B	A		B	A	D	B	B		B	
Approach Delay (s)		14.1			12.9			29.9			10.4	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay			17.4		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			64.5%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Flt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Volume (vph)	269	931	547	195	768	268	390	348	317	180	313	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	980	576	205	808	282	411	366	334	189	329	182
RTOR Reduction (vph)	0	0	373	0	75	0	0	0	251	0	0	150
Lane Group Flow (vph)	283	980	203	205	1015	0	250	527	83	167	351	32
Turn Type	Prot	Perm		Prot	Split		Perm		Split	Perm		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases		4							2			6
Actuated Green, G (s)	12.5	22.5	22.5	9.8	19.8		16.0	16.0	16.0	13.7	13.7	13.7
Effective Green, g (s)	13.0	23.0	23.0	10.3	20.3		16.5	16.5	16.5	14.2	14.2	14.2
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.25		0.21	0.21	0.21	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1017	455	228	1240		332	689	326	286	600	281
v/s Ratio Prot	0.08	c0.28		0.12	c0.21		0.16	c0.16		0.10	c0.10	
v/s Ratio Perm			0.13						0.05			0.02
v/c Ratio	0.51	0.96	0.45	0.90	0.82		0.75	0.76	0.26	0.58	0.58	0.11
Uniform Delay, d1	30.6	28.1	23.3	34.3	28.1		29.8	29.9	26.6	30.2	30.2	27.6
Progression Factor	0.52	0.49	1.05	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	19.2	2.8	33.4	6.1		9.3	5.1	0.4	3.0	1.5	0.2
Delay (s)	16.5	33.1	27.3	67.7	34.2		39.1	35.0	27.0	33.2	31.7	27.8
Level of Service	B	C	C	E	C		D	C	C	C	C	C
Approach Delay (s)		28.7			39.5			33.5			31.0	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay	33.0			HCM Level of Service				C				
HCM Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	73.1%			ICU Level of Service				D				
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	150	774	324	115	510	152	316	511	102	292	529	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	815	341	121	537	160	333	538	107	307	557	242
RTOR Reduction (vph)	0	66	0	0	0	121	0	0	70	0	0	183
Lane Group Flow (vph)	158	1090	0	121	537	39	333	538	37	307	557	59
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.5	16.5		5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	17.0		6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	822		152	859	384	354	639	543	177	452	384
v/s Ratio Prot	c0.09	c0.32		0.07	0.15		c0.19	0.29		c0.17	c0.30	
v/s Ratio Perm					0.02			0.02			0.04	
v/c Ratio	1.04	1.33		0.80	0.63	0.10	0.94	0.84	0.07	1.73	1.23	0.15
Uniform Delay, d1	32.0	26.5		31.4	23.7	20.6	27.6	21.2	15.5	31.5	26.5	20.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.8	155.2		24.3	1.4	0.1	32.7	12.7	0.2	353.0	122.6	0.8
Delay (s)	115.8	181.7		55.7	25.1	20.7	60.3	34.0	15.7	384.5	149.1	21.7
Level of Service	F	F		E	C	C	E	C	B	F	F	C
Approach Delay (s)		173.8			28.8			41.0			186.5	
Approach LOS		F			C			D			F	
Intersection Summary												
HCM Average Control Delay		118.2										F
HCM Volume to Capacity ratio		1.24										
Actuated Cycle Length (s)		70.0							16.0			
Intersection Capacity Utilization		96.8%										F
Analysis Period (min)		15										
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak













	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3516		1770	3539	1583	1770	1658	1583	1770	1653	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3516		1770	3539	1583	1770	1658	1583	1770	1653	1583
Volume (vph)	107	736	33	62	909	320	48	23	63	562	35	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	775	35	65	957	337	51	24	66	592	37	111
RTOR Reduction (vph)	0	4	0	0	0	115	0	61	0	0	58	0
Lane Group Flow (vph)	113	806	0	65	957	222	51	29	0	592	90	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.6	21.9		4.4	20.7	20.7	3.3	6.3		39.4	42.4	
Effective Green, g (s)	6.1	22.4		4.9	21.2	21.2	3.8	6.8		39.9	42.9	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	875		96	834	373	75	125		785	788	
v/s Ratio Prot	0.06	c0.23		0.04	c0.27		c0.03	0.02		c0.33	c0.05	
v/s Ratio Perm					0.14							
v/c Ratio	0.94	0.92		0.68	1.15	0.59	0.68	0.23		0.75	0.11	
Uniform Delay, d1	41.8	32.9		41.8	34.4	30.6	42.5	39.1		20.9	13.0	
Progression Factor	1.00	1.00		0.66	0.60	0.26	1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.8	16.5		15.3	78.7	6.0	22.4	1.0		4.1	0.1	
Delay (s)	105.6	49.4		42.9	99.3	13.9	64.9	40.1		25.1	13.1	
Level of Service	F	D		D	F	B	E	D		C	B	
Approach Delay (s)		56.3			75.4			49.1			22.7	
Approach LOS		E			E			D			C	
Intersection Summary												
HCM Average Control Delay		56.3										E
HCM Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		90.0								20.0		
Intersection Capacity Utilization		80.6%										D
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps

2020 + Alternative A

Graton Rancheria Casino & Hotel

PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↱	↱	↑↑					↱↱	↱		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0		
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00		
Frt		1.00	0.85	1.00	1.00					1.00	0.85		
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00		
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583		
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00		
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583		
Volume (vph)	0	969	392	119	1023	0	0	0	0	626	0	268	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	1020	413	125	1077	0	0	0	0	659	0	282	
RTOR Reduction (vph)	0	0	92	0	0	0	0	0	0	0	65	0	
Lane Group Flow (vph)	0	1020	321	125	1077	0	0	0	0	659	217	0	
Turn Type		Perm		Prot						Prot			
Protected Phases		4		3		8				1		6	
Permitted Phases				4									
Actuated Green, G (s)		33.5	33.5	14.5	52.5					28.5	28.5		
Effective Green, g (s)		34.0	34.0	15.0	53.0					29.0	29.0		
Actuated g/C Ratio		0.38	0.38	0.17	0.59					0.32	0.32		
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5		
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0		
Lane Grp Cap (vph)		1337	598	295	2084					1106	510		
v/s Ratio Prot		c0.29		0.07	c0.30					c0.19	0.14		
v/s Ratio Perm			0.20										
v/c Ratio		0.76	0.54	0.42	0.52					0.60	0.43		
Uniform Delay, d1		24.5	21.9	33.6	10.9					25.6	24.0		
Progression Factor		0.50	0.43	1.25	1.63					1.00	1.00		
Incremental Delay, d2		2.5	2.1	0.9	0.9					0.9	2.6		
Delay (s)		14.8	11.5	42.9	18.7					26.5	26.5		
Level of Service		B	B	D	B					C	C		
Approach Delay (s)		13.9			21.2			0.0			26.5		
Approach LOS		B			C			A			C		
Intersection Summary													
HCM Average Control Delay		19.6		HCM Level of Service				B					
HCM Volume to Capacity ratio		0.64											
Actuated Cycle Length (s)		90.0		Sum of lost time (s)				8.0					
Intersection Capacity Utilization		66.5%		ICU Level of Service				C					
Analysis Period (min)		15											
c Critical Lane Group													

25: Gravenstien Hwy & US-101 NB Ramps

2020 + Alternative A

Graton Rancheria Casino & Hotel

PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR						
Lane Configurations	↑↑			↑↑	↓	↓						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Total Lost time (s)	4.0			4.0	4.0	4.0						
Lane Util. Factor	0.95			0.95	0.97	1.00						
Frt	1.00			1.00	1.00	0.85						
Flt Protected	1.00			1.00	0.95	1.00						
Satd. Flow (prot)	3539			3539	3433	1583						
Flt Permitted	1.00			1.00	0.95	1.00						
Satd. Flow (perm)	3539			3539	3433	1583						
Volume (vph)	1594	0	0	700	442	255						
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95						
Adj. Flow (vph)	1678	0	0	737	465	268						
RTOR Reduction (vph)	0	0	0	0	0	14						
Lane Group Flow (vph)	1678	0	0	737	465	254						
Turn Type					Perm							
Protected Phases	4			8	2							
Permitted Phases						2						
Actuated Green, G (s)	61.2			61.2	19.8	19.8						
Effective Green, g (s)	61.7			61.7	20.3	20.3						
Actuated g/C Ratio	0.69			0.69	0.23	0.23						
Clearance Time (s)	4.5			4.5	4.5	4.5						
Vehicle Extension (s)	3.0			3.0	3.0	3.0						
Lane Grp Cap (vph)	2426			2426	774	357						
v/s Ratio Prot	c0.47			0.21	0.14							
v/s Ratio Perm						c0.16						
v/c Ratio	0.69			0.30	0.60	0.71						
Uniform Delay, d1	8.5			5.6	31.2	32.2						
Progression Factor	0.29			1.00	1.00	1.00						
Incremental Delay, d2	1.2			0.3	1.3	6.6						
Delay (s)	3.6			5.9	32.5	38.7						
Level of Service	A			A	C	D						
Approach Delay (s)	3.6			5.9	34.8							
Approach LOS	A			A	C							
Intersection Summary												
HCM Average Control Delay		11.4			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		66.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	4	9	18	24	232	8	803	24	119	714	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	4	9	19	25	244	8	845	25	125	752	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)							5					
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1580	1893	379	1500	1872	423	759			871		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1580	1893	379	1500	1872	423	759			871		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	53	93	98	72	57	58	99			84		
cM capacity (veh/h)	25	57	618	68	59	580	848			770		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	288	8	423	423	25	125	501	258			
Volume Left	12	19	8	0	0	0	125	0	0			
Volume Right	9	244	0	0	0	25	0	0	7			
cSH	46	411	848	1700	1700	1700	770	1700	1700			
Volume to Capacity	0.55	0.70	0.01	0.25	0.25	0.01	0.16	0.29	0.15			
Queue Length 95th (ft)	52	132	1	0	0	0	14	0	0			
Control Delay (s)	156.3	35.5	9.3	0.0	0.0	0.0	10.6	0.0	0.0			
Lane LOS	F	E	A				B					
Approach Delay (s)	156.3	35.5	0.1				1.5					
Approach LOS	F	E										
Intersection Summary												
Average Delay			7.5									
Intersection Capacity Utilization			49.9%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	142	4	7	271	2	2	0	2	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	149	4	7	285	2	2	0	2	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	287			154			455	456	152	457	457	286
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			154			455	456	152	457	457	286
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	100	100	100
cM capacity (veh/h)	1275			1427			512	498	895	510	497	753
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	155	295	4	2								
Volume Left	1	7	2	1								
Volume Right	4	2	2	0								
cSH	1275	1427	651	504								
Volume to Capacity	0.00	0.01	0.01	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.2	10.6	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.6	12.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			29.1%			ICU Level of Service			A			
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	129	2	4	285	8	1	10	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	136	2	4	300	8	1	11	0	3	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	308			138			455	458	137	459	455	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	308			138			455	458	137	459	455	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1252			1446			512	497	912	502	499	736
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	313	12	5								
Volume Left	2	4	1	3								
Volume Right	2	8	0	1								
cSH	1252	1446	498	536								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.4	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.4	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		27.7%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	153	10	4	343	17	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	161	11	4	361	18	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		536	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		536	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	99
cM capacity (veh/h)			1405		504	878
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	365	27			
Volume Left	0	4	18			
Volume Right	11	0	9			
cSH	1700	1405	591			
Volume to Capacity	0.10	0.00	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.1	11.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		31.2%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	150	16	17	244	0	107	0	29	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	158	17	18	257	0	113	0	31	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	257			175			459	459	166	489	467	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			175			459	459	166	489	467	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			78	100	97	100	100	100
cM capacity (veh/h)	1308			1402			507	492	878	467	487	782
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	175	275	143	0								
Volume Left	0	18	113	0								
Volume Right	17	0	31	0								
cSH	1308	1402	558	1700								
Volume to Capacity	0.00	0.01	0.26	0.00								
Queue Length 95th (ft)	0	1	25	0								
Control Delay (s)	0.0	0.6	13.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.6	13.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization		40.3%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	137	32	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	144	34	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			178		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1398		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	178	247	34			
Volume Left	0	0	34			
Volume Right	34	0	0			
cSH	1700	1398	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	83	1093	164	247	1186	557	194	42	368	582	130
v/c Ratio	0.16	1.07	0.35	0.44	1.99	0.86	0.90	0.19	0.83	0.85	0.48
Control Delay	42.2	102.6	29.2	36.3	473.9	37.0	108.2	71.1	22.6	73.6	52.3
Queue Delay	0.0	128.0	0.0	15.5	114.9	81.2	0.0	0.0	17.8	495.0	0.0
Total Delay	42.2	230.6	29.2	51.8	588.8	118.2	108.2	71.1	40.4	568.7	52.3
Queue Length 50th (ft)	64	~696	91	185	~2073	351	203	22	0	300	92
Queue Length 95th (ft)	111	#842	168	m227m#2070	m276	#352	43	110	#474	165	
Internal Link Dist (ft)		550		220			110			270	
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	475	567	597	650	221	376	497	686	270
Starvation Cap Reductn	0	0	0	299	68	176	0	0	0	0	0
Spillback Cap Reductn	0	218	0	0	0	0	0	0	121	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	1.37	0.35	0.92	2.24	1.18	0.88	0.11	0.98	2.10	0.48
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1343	698	89	1182	446	1166
v/c Ratio	0.80	0.79	0.35	0.58	0.85	1.51dr
Control Delay	27.6	22.7	45.8	21.4	43.0	96.0
Queue Delay	81.9	30.4	0.0	0.4	0.0	141.9
Total Delay	109.5	53.1	45.8	21.8	43.0	237.9
Queue Length 50th (ft)	399	287	21	284	226	~364
Queue Length 95th (ft)	m483	m497	m25	m233	#405	#496
Internal Link Dist (ft)	220		466		348	
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	886	257	2035	523	1035
Starvation Cap Reductn	541	219	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	229
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.18	1.05	0.35	0.70	0.85	1.45
Intersection Summary						
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						
m Volume for 95th percentile queue is metered by upstream signal.						
dr Defacto Right Lane. Recode with 1 though lane as a right lane.						

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	862	928	187	451	415	433	601	9	18
v/c Ratio	0.71	0.92	0.36	0.29	1.20	1.24	0.57	0.02	0.05
Control Delay	42.0	26.5	39.0	18.2	136.4	155.3	7.7	25.7	18.8
Queue Delay	0.0	35.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	42.0	61.7	39.0	18.2	136.4	155.3	8.1	25.7	18.8
Queue Length 50th (ft)	195	281	52	114	~252	~271	36	4	4
Queue Length 95th (ft)	186	#353	85	158	m#300	m#318	m30	16	21
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1208	1014	515	1542	347	348	1052	365	363
Starvation Cap Reductn	0	149	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	130	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.07	0.36	0.29	1.20	1.24	0.65	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	189	1282	871	144	96
v/c Ratio	0.43	0.57	0.54	0.31	0.20
Control Delay	28.0	20.2	17.1	25.9	6.6
Queue Delay	0.0	1.9	0.0	0.0	0.0
Total Delay	28.0	22.1	17.1	25.9	6.6
Queue Length 50th (ft)	56	322	155	58	0
Queue Length 95th (ft)	m72	329	223	106	34
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1621	465	486
Starvation Cap Reductn	0	772	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.86	0.54	0.31	0.20
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					





12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	466	470	114	31	586	520	9	415	702
v/c Ratio	1.06	1.06	0.23	0.20	1.10	0.27	0.06	0.51	0.80
Control Delay	90.1	91.3	6.3	29.4	99.9	12.2	35.8	34.0	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Total Delay	90.1	91.3	6.3	29.4	99.9	12.2	35.8	34.0	13.9
Queue Length 50th (ft)	~272	~276	0	10	~339	51	4	106	36
Queue Length 95th (ft)	#460	#463	37	35	#531	147	m5	m127	m82
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	500	183	531	1935	177	807	878
Starvation Cap Reductn	0	0	0	0	0	0	0	0	38
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.06	0.23	0.17	1.10	0.27	0.05	0.51	0.84
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	315	392	620	300	240	487
v/c Ratio	0.77	0.59	0.78	0.36	0.86	0.41
Control Delay	37.5	6.7	25.5	3.1	58.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	6.7	25.5	3.1	58.8	7.0
Queue Length 50th (ft)	115	0	207	0	95	82
Queue Length 95th (ft)	#221	60	#378	40	#213	135
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	685	790	844	278	1199
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.57	0.78	0.36	0.86	0.41
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	61	567	47	128	615	432	73	78	69	600	160
v/c Ratio	0.46	0.77	0.13	0.50	0.84	0.64	0.28	0.18	0.17	1.13	0.18
Control Delay	47.1	38.0	9.3	38.1	24.4	6.3	38.1	11.7	8.3	109.2	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	38.0	9.3	38.1	24.4	6.3	38.1	11.7	8.3	109.2	5.8
Queue Length 50th (ft)	30	141	0	21	95	0	18	7	0	~353	14
Queue Length 95th (ft)	67	197	26	m41	#187	6	38	43	33	#547	48
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	373	257	752	677	257	425	417	531	879
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.75	0.13	0.50	0.82	0.64	0.28	0.18	0.17	1.13	0.18
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	220	953	124	472	806	429	128	462	266	462	221	240
v/c Ratio	0.79	0.58	0.21	0.92	0.72	0.54	0.49	0.67	0.59	0.81	0.67	0.50
Control Delay	35.5	17.9	5.3	45.5	17.7	4.0	40.8	20.8	9.6	48.0	40.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	17.9	5.3	45.5	17.7	4.0	40.8	20.8	9.6	48.0	40.5	8.0
Queue Length 50th (ft)	73	106	10	131	163	31	60	60	0	116	103	0
Queue Length 95th (ft)	m98	m109	m14	#204	195	41	#136	104	64	#237	169	56
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1653	598	515	1126	790	260	843	516	572	396	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.58	0.21	0.92	0.72	0.54	0.49	0.55	0.52	0.81	0.56	0.46
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1904	82	1361	246	24	364	364	340
v/c Ratio	0.80	0.56	0.67	0.16	0.05	0.85	0.85	0.63
Control Delay	10.1	56.3	10.2	0.1	9.5	44.6	44.6	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	56.3	10.2	0.1	9.5	44.6	44.6	25.4
Queue Length 50th (ft)	142	44	150	0	2	165	165	119
Queue Length 95th (ft)	#411	m63	m172	m0	17	#311	#311	203
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2368	146	2034	1583	572	476	476	597
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.56	0.67	0.16	0.04	0.76	0.76	0.57
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	20	1427	531	1040	361	646	198	198	18
v/c Ratio	0.15	0.55	0.34	0.57	0.23	0.94	0.27	0.27	0.02
Control Delay	37.1	19.6	0.3	17.1	0.2	43.4	11.8	11.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	19.6	0.3	17.1	0.2	43.4	11.8	11.8	8.3
Queue Length 50th (ft)	11	187	0	86	0	268	51	51	3
Queue Length 95th (ft)	m12	213	m0	134	m0	#495	92	92	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2613	1583	1819	1583	730	792	792	796
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.55	0.34	0.57	0.23	0.88	0.25	0.25	0.02
Intersection Summary									
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	283	980	576	205	1090	250	527	334	167	351	182
v/c Ratio	0.51	0.96	0.70	0.90	0.83	0.76	0.77	0.58	0.58	0.58	0.42
Control Delay	19.0	35.8	8.4	78.6	33.8	45.9	38.3	8.8	38.3	33.9	7.8
Queue Delay	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	35.8	9.2	78.6	33.8	45.9	38.3	8.8	38.3	33.9	7.8
Queue Length 50th (ft)	44	67	45	104	175	128	136	7	84	89	0
Queue Length 95th (ft)	69	#370	90	#264	#276	#245	193	75	147	128	50
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1017	828	229	1317	342	710	585	342	718	480
Starvation Cap Reductn	0	0	72	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.96	0.76	0.90	0.83	0.73	0.74	0.57	0.49	0.49	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	1156	121	537	160	333	538	107	307	557	242
v/c Ratio	1.04	1.30	0.80	0.63	0.32	0.94	0.84	0.17	1.73	1.23	0.43
Control Delay	120.6	169.6	69.1	27.4	6.0	66.0	35.8	4.6	378.4	150.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.6	169.6	69.1	27.4	6.0	66.0	35.8	4.6	378.4	150.1	6.0
Queue Length 50th (ft)	~75	~331	52	108	0	142	210	0	~200	~303	0
Queue Length 95th (ft)	#183	#452	#138	157	42	#290	#378	29	#344	#482	51
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	887	152	859	506	354	639	613	177	452	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.30	0.80	0.63	0.32	0.94	0.84	0.17	1.73	1.23	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	↖	→	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	810	65	957	337	51	90	592	148
v/c Ratio	0.93	0.82	0.55	1.06	0.65	0.43	0.44	0.77	0.17
Control Delay	111.2	39.5	43.8	67.5	9.8	52.2	21.6	31.9	5.7
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.2	40.0	43.8	67.5	9.8	52.2	21.6	31.9	5.7
Queue Length 50th (ft)	65	233	37	~324	7	28	13	286	12
Queue Length 95th (ft)	#171	#342	m#79	#424	32	65	56	#513	47
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	121	986	118	904	517	118	367	767	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	28	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.85	0.55	1.06	0.65	0.43	0.25	0.77	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	→	↙	↖	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1020	413	125	1077	659	282
v/c Ratio	0.76	0.60	0.42	0.52	0.60	0.49
Control Delay	15.0	8.5	46.9	19.0	28.3	19.2
Queue Delay	1.1	0.5	0.0	0.3	0.0	0.0
Total Delay	16.2	9.0	46.9	19.3	28.3	19.2
Queue Length 50th (ft)	151	71	70	260	160	82
Queue Length 95th (ft)	182	m102	m124	322	216	157
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1337	690	295	2084	1106	575
Starvation Cap Reductn	135	62	0	426	0	0
Spillback Cap Reductn	21	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.66	0.42	0.65	0.60	0.49
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1678	737	465	268
v/c Ratio	0.69	0.30	0.60	0.72
Control Delay	4.0	6.8	33.7	40.4
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	4.1	6.8	33.7	40.4
Queue Length 50th (ft)	35	74	123	133
Queue Length 95th (ft)	240	138	150	191
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2425	2425	1221	574
Starvation Cap Reductn	61	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.30	0.38	0.47
Intersection Summary				

**NEAR-TERM 2008 + ALTERNATIVE B
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	8	14	280	13	97	12	844	62	196	514	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	295	14	102	13	888	65	206	541	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1927	1934	543	1919	1903	921	544			954		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1927	1934	543	1919	1903	921	544			954		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	82	97	0	72	69	99			71		
cM capacity (veh/h)	21	46	540	33	49	328	1025			721		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	411	13	954	206	544						
Volume Left	0	295	13	0	206	0						
Volume Right	15	102	0	65	0	3						
cSH	111	43	1025	1700	721	1700						
Volume to Capacity	0.21	9.48	0.01	0.56	0.29	0.32						
Queue Length 95th (ft)	19	Err	1	0	30	0						
Control Delay (s)	45.8	Err	8.6	0.0	12.0	0.0						
Lane LOS	E	F	A		B							
Approach Delay (s)	45.8	Err	0.1		3.3							
Approach LOS	E	F										
Intersection Summary												
Average Delay		1910.5										
Intersection Capacity Utilization		91.9%		ICU Level of Service		F						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	131	131	620	201	10	184	32	804	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	138	653	212	11	194	34	846	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	222			276			1766	1755	207	2613	1819	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			276			1766	1755	207	2613	1819	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			49			0	19	0	0	72	99
cM capacity (veh/h)	1347			1287			31	42	834	0	38	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	286	875	1074	32								
Volume Left	11	653	194	11								
Volume Right	138	11	846	11								
cSH	1347	1287	133	0								
Volume to Capacity	0.01	0.51	8.06	Err								
Queue Length 95th (ft)	1	74	Err	Err								
Control Delay (s)	0.4	9.5	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.4	9.5	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay		Err										
Intersection Capacity Utilization		139.1%		ICU Level of Service		H						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	925	10	10	810	20	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	974	11	11	853	21	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	874			984			1900	1895	979	1900	1889	863
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874			984			1900	1895	979	1900	1889	863
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			76	84	97	76	85	97
cM capacity (veh/h)	772			702			44	68	303	44	68	354
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	995	884	32	32								
Volume Left	11	11	11	11								
Volume Right	11	21	11	11								
cSH	772	702	74	74								
Volume to Capacity	0.01	0.01	0.43	0.42								
Queue Length 95th (ft)	1	1	43	42								
Control Delay (s)	0.4	0.4	86.6	85.3								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.4	0.4	86.6	85.3								
Approach LOS			F	F								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization		65.2%		ICU Level of Service		C						
Analysis Period (min)		15										

















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	924	10	10	810	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	973	11	11	853	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	863			983			1894	1883	978	1894	1883	858
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	863			983			1894	1883	978	1894	1883	858
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			76	85	97	76	85	97
cM capacity (veh/h)	779			702			45	69	304	44	69	357
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	994	874	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	779	702	74	75								
Volume to Capacity	0.01	0.01	0.42	0.42								
Queue Length 95th (ft)	1	1	42	42								
Control Delay (s)	0.4	0.4	85.0	83.9								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.4	0.4	85.0	83.9								
Approach LOS			F	F								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization		65.1%		ICU Level of Service		C						
Analysis Period (min)		15										

















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	   												
Sign Control	Free				Free				Stop		Stop		
Grade	0%												
Volume (veh/h)	60	807	77	116	769	99	35	6	266	112	21	14	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	63	849	81	122	809	104	37	6	280	118	22	15	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								None		None			
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	914			931				2148	2174	890	2405	2163	862
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	914			931				2148	2174	890	2405	2163	862
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			83				0	82	18	0	39	96
cM capacity (veh/h)	746			735				14	35	342	3	36	355
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	994	1036	323	155									
Volume Left	63	122	37	118									
Volume Right	81	104	280	15									
cSH	746	735	91	4									
Volume to Capacity	0.08	0.17	3.56	40.92									
Queue Length 95th (ft)	7	15	Err	Err									
Control Delay (s)	2.5	4.7	Err	Err									
Lane LOS	A	A	F	F									
Approach Delay (s)	2.5	4.7	Err	Err									
Approach LOS			F	F									
Intersection Summary													
Average Delay	1908.7												
Intersection Capacity Utilization	120.0%		ICU Level of Service					H					
Analysis Period (min)	15												























6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Volume (veh/h)	52	985	148	187	857	89	80	45	222	88	13	47	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	55	1037	156	197	902	94	84	47	234	93	14	49	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None			None			
Median storage veh													
Upstream signal (ft)	630												
pX, platoon unblocked	0.67						0.67	0.67			0.67	0.67	0.67
vC, conflicting volume	996				1193			2623	2614	1115	2824	2645	949
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	994				1193			3421	3407	1115	3721	3453	924
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88				66			0	0	8	0	0	77
cM capacity (veh/h)	467				585			0	3	253	0	3	219
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	1247	1193	365	156									
Volume Left	55	197	84	93									
Volume Right	156	94	234	49									
cSH	467	585	0	0									
Volume to Capacity	0.12	0.34	Err	Err									
Queue Length 95th (ft)	10	37	Err	Err									
Control Delay (s)	5.8	12.0	Err	Err									
Lane LOS	A	B	F	F									
Approach Delay (s)	5.8	12.0	Err	Err									
Approach LOS			F	F									
Intersection Summary													
Average Delay			Err										
Intersection Capacity Utilization	153.9%		ICU Level of Service		H								
Analysis Period (min)	15												


























7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1823		1681	1770	1583	1770	3539	1583	3433	1734	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1823		1681	1770	1583	1770	3539	1583	3433	1734	
Volume (vph)	105	1023	166	181	817	540	204	155	265	451	131	112
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	1077	175	191	860	568	215	163	279	475	138	118
RTOR Reduction (vph)	0	4	0	0	0	164	0	0	256	0	19	0
Lane Group Flow (vph)	0	1360	0	191	860	404	215	163	23	475	237	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		47.5		53.5	53.5	53.5	19.5	12.7	12.7	28.3	21.5	
Effective Green, g (s)		48.0		54.0	54.0	54.0	20.0	13.2	13.2	28.8	22.0	
Actuated g/C Ratio		0.30		0.34	0.34	0.34	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		547		567	597	534	221	292	131	618	238	
v/s Ratio Prot		c0.75		0.11	c0.49		c0.12	0.05		0.14	c0.14	
v/s Ratio Perm						0.26			0.01			
v/c Ratio		2.49		0.34	1.44	0.76	0.97	0.56	0.18	0.77	1.00	
Uniform Delay, d1		56.0		39.6	53.0	47.2	69.7	70.6	68.3	62.4	69.0	
Progression Factor		1.00		0.87	0.90	0.94	1.00	1.00	1.00	0.96	0.96	
Incremental Delay, d2		673.9		1.2	205.2	7.2	52.5	2.3	0.6	5.7	56.7	
Delay (s)		729.9		35.5	253.0	51.3	122.2	72.9	69.0	65.7	122.9	
Level of Service		F		D	F	D	F	E	E	E	F	
Approach Delay (s)		729.9			156.6			87.4			85.8	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			313.1		HCM Level of Service					F		
HCM Volume to Capacity ratio			1.66									
Actuated Cycle Length (s)			160.0		Sum of lost time (s)					16.0		
Intersection Capacity Utilization			151.1%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												












8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528		
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528		
Volume (vph)	5	30	140	5	95	95	164	161	5	30	212		5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	169	5	32	223		5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	2	0	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	169	3	32	227		0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot			
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases			4						2				
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.7	48.9	48.9	3.3	39.5		
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		13.2	49.4	49.4	3.8	40.0		
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.16	0.62	0.62	0.05	0.50		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	40	210	178	40	368		292	2185	978	84	1764		
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06		
v/s Ratio Perm			0.01						0.00				
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.59	0.08	0.00	0.38	0.13		
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.9	6.1	5.9	37.0	10.7		
Progression Factor	1.00	1.00	1.00	0.83	1.31		1.03	0.68	0.60	1.00	1.00		
Incremental Delay, d2	1.4	0.3	0.2	1.0	0.3		0.8	0.0	0.0	2.9	0.2		
Delay (s)	39.7	32.4	32.1	32.7	43.2		32.7	4.2	3.5	39.8	10.8		
Level of Service	D	C	C	C	D		C	A	A	D	B		
Approach Delay (s)		32.3			42.9			18.4			14.4		
Approach LOS		C			D			B			B		
Intersection Summary													
HCM Average Control Delay	25.0			HCM Level of Service					C				
HCM Volume to Capacity ratio	0.25												
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0				
Intersection Capacity Utilization	30.8%			ICU Level of Service					A				
Analysis Period (min)	15												
c Critical Lane Group													






















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	981	649	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1033	683	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1033	714	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	10.0	50.5	36.0		20.5	20.5
Effective Green, g (s)	10.5	51.0	36.5		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	451	2256	1603		465	416
v/s Ratio Prot	0.06	c0.29	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.45	0.46	0.45		0.21	0.16
Uniform Delay, d1	32.1	7.4	14.8		23.0	22.7
Progression Factor	0.92	2.12	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	0.9		1.0	0.8
Delay (s)	30.1	16.3	15.7		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)		18.6	15.7		23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		18.5		HCM Level of Service		B
HCM Volume to Capacity ratio		0.39				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		40.3%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	755	3	40	8	3	5	514	489	2	7	435	706
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	795	3	42	8	3	5	541	515	2	7	458	743
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	565
Lane Group Flow (vph)	398	400	11	0	11	0	541	516	0	7	458	178
Turn Type	Split		Perm		Split		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.0	20.0	20.0		1.5		27.1	39.0		1.5	13.4	13.4
Effective Green, g (s)	20.5	20.5	20.5		2.0		27.6	39.5		2.0	13.9	13.9
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	431	432	406		44		611	1746		44	615	275
v/s Ratio Prot	0.24	c0.24			c0.01		c0.31	0.15		0.00	c0.13	
v/s Ratio Perm			0.01									0.11
v/c Ratio	0.92	0.93	0.03		0.25		0.89	0.30		0.16	0.74	0.65
Uniform Delay, d1	29.0	29.0	22.3		38.3		24.7	12.0		38.2	31.4	30.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.24	1.12	4.05
Incremental Delay, d2	25.3	25.7	0.0		3.0		14.4	0.4		1.0	4.9	6.9
Delay (s)	54.3	54.7	22.3		41.3		39.1	12.4		48.4	40.0	131.4
Level of Service	D	D	C		D		D	B		D	D	F
Approach Delay (s)		52.9			41.3		26.1				96.2	
Approach LOS		D			D		C				F	
Intersection Summary												
HCM Average Control Delay			60.5			HCM Level of Service			E			
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			85.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												














13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	86	832	480	0	808
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	91	876	505	0	851
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1979	1128			1381	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1979	1128			1381	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	64			100	
cM capacity (veh/h)	68	248			496	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	91	1381	851			
Volume Left	0	0	0			
Volume Right	91	505	0			
cSH	248	1700	1700			
Volume to Capacity	0.36	0.81	0.50			
Queue Length 95th (ft)	40	0	0			
Control Delay (s)	27.6	0.0	0.0			
Lane LOS	D					
Approach Delay (s)	27.6	0.0	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay		1.1				
Intersection Capacity Utilization		85.1%		ICU Level of Service	E	
Analysis Period (min)		15				













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations				 	 		
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	172	89	33	464	489	41	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	181	94	35	488	515	43	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	850	279	558				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	850	279	558				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	37	87	97				
cM capacity (veh/h)	289	718	1009				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	181	94	35	244	244	343	215
Volume Left	181	0	35	0	0	0	0
Volume Right	0	94	0	0	0	0	43
cSH	289	718	1009	1700	1700	1700	1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20	0.13
Queue Length 95th (ft)	97	11	3	0	0	0	0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	B	A				
Approach Delay (s)	27.5		0.6			0.0	
Approach LOS	D						
Intersection Summary							
Average Delay			5.8				
Intersection Capacity Utilization	37.7%		ICU Level of Service			A	
Analysis Period (min)			15				






















16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	649	663	251	275	532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	683	698	264	289	560
RTOR Reduction (vph)	0	283	0	154	0	0
Lane Group Flow (vph)	271	400	698	110	289	560
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	15.5	15.5	26.5	26.5	9.5	40.5
Effective Green, g (s)	16.0	16.0	27.0	27.0	10.0	41.0
Actuated g/C Ratio	0.25	0.25	0.42	0.42	0.15	0.63
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	390	774	658	272	1175
v/s Ratio Prot	0.15		c0.37		c0.16	0.30
v/s Ratio Perm		c0.25		0.07		
v/c Ratio	0.62	1.03	0.90	0.17	1.06	0.48
Uniform Delay, d1	21.8	24.5	17.8	11.9	27.5	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	52.5	15.7	0.5	72.0	1.4
Delay (s)	24.6	77.0	33.5	12.5	99.5	7.7
Level of Service	C	E	C	B	F	A
Approach Delay (s)	62.1		27.7		39.0	
Approach LOS	E		C		D	
Intersection Summary						
HCM Average Control Delay			43.0	HCM Level of Service		D
HCM Volume to Capacity ratio			0.97			
Actuated Cycle Length (s)			65.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			81.7%	ICU Level of Service		D
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	663	36	202	938	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	698	38	213	987	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	103	0	63	70	0	59	0
Lane Group Flow (vph)	53	698	9	213	987	59	67	34	15	284	90	0
Turn Type	Prot		Perm		Prot		Perm		Prot		Perm	
Protected Phases	7		4		3		8		5		2	
Permitted Phases			4				8				2	
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.20		0.06	c0.28		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.04			0.01			
v/c Ratio	0.63	0.84	0.02	0.83	1.06	0.14	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	29.2	23.5	36.5	29.5	22.6	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	1.00	0.55	0.18	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	7.4	0.0	11.1	40.2	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	36.6	23.6	47.5	56.4	4.1	36.8	28.5	27.7	23.4	14.2	
Level of Service	D	D	C	D	E	A	D	C	C	C	B	
Approach Delay (s)	37.0				48.8		30.4				20.2	
Approach LOS	D				D		C				C	
Intersection Summary												
HCM Average Control Delay			39.5		HCM Level of Service				D			
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			61.7%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	764	146	371	1019	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	804	154	391	1073	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	212	0	117	227	0	0	206
Lane Group Flow (vph)	245	804	51	391	1073	165	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.16		0.11	c0.30		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.10			0.03			0.03
v/c Ratio	0.88	0.48	0.10	0.76	0.94	0.32	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.2	18.5	32.6	26.2	20.4	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.81	0.51	0.38	0.70	0.63	0.35	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.2	0.7	0.3	4.4	11.3	1.1	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	45.8	11.5	7.2	27.1	27.8	8.3	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	C	A	D	C	C	D	D	C
Approach Delay (s)		17.9			23.7			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00				1.00	0.95	0.95
Frt		0.97		1.00	1.00	0.85				0.90	1.00	1.00
Flt Protected		1.00		0.95	1.00	1.00				0.99	0.95	0.95
Satd. Flow (prot)		4923		1770	3539	1583				1658	1681	1686
Flt Permitted		1.00		0.95	1.00	1.00				0.91	0.74	0.71
Satd. Flow (perm)		4923		1770	3539	1583				1529	1311	1254
Volume (vph)	0	1219	330	68	1387	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1283	347	72	1460	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	57	0	0	0	0	0	12	0	0	0	19
Lane Group Flow (vph)	0	1573	0	72	1460	209	0	13	0	370	370	350
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free	2						6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2209		117	2000	1583		512		439	420	530
v/s Ratio Prot		0.32		0.04	c0.41							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.22
v/c Ratio		0.71		0.62	0.73	0.13		0.03		0.84	0.88	0.66
Uniform Delay, d1		17.9		36.4	12.9	0.0		17.8		24.6	25.1	22.7
Progression Factor		0.41		1.23	0.75	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.6		6.0	1.5	0.1		0.0		13.7	18.9	3.1
Delay (s)		8.9		50.8	11.2	0.1		17.9		38.4	44.0	25.8
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		8.9			11.5			17.9			36.1	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.7			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		73.4%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱	↰	↑	↱		↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	
Flt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.84	
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1531	
Volume (vph)	17	1642	273	0	997	350	654	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1728	287	0	1049	368	688	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	1	0
Lane Group Flow (vph)	18	1728	287	0	1049	368	688	160	160	0	17	0
Turn Type	Prot	Free			Free	Perm		Perm	Perm			
Protected Phases	7	4			8			2			6	
Permitted Phases		Free			Free	2		2		6		
Actuated Green, G (s)	2.2	30.6	80.0		23.9	80.0	40.4	40.4	40.4		40.4	
Effective Green, g (s)	2.7	31.1	80.0		24.4	80.0	40.9	40.9	40.9		40.9	
Actuated g/C Ratio	0.03	0.39	1.00		0.30	1.00	0.51	0.51	0.51		0.51	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	2491	1583		1551	1583	710	769	769		783	
v/s Ratio Prot	0.01	c0.27			0.21			0.11				
v/s Ratio Perm			0.18			0.23	c0.50		0.11		0.01	
v/c Ratio	0.30	0.69	0.18		0.68	0.23	0.97	0.21	0.21		0.02	
Uniform Delay, d1	37.7	20.5	0.0		24.3	0.0	18.9	10.7	10.7		9.7	
Progression Factor	1.06	1.09	1.00		0.69	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.8	1.0	0.2		1.8	0.3	25.9	0.1	0.1		0.0	
Delay (s)	41.8	23.4	0.2		18.5	0.3	44.9	10.8	10.8		9.7	
Level of Service	D	C	A		B	A	D	B	B		A	
Approach Delay (s)		20.3			13.8			34.0			9.7	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM Average Control Delay		21.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		71.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑↑	↱	↰	↑	↱	↰	↑↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Flt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1149	545	141	783	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1209	574	148	824	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	38	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1209	179	148	965	0	226	475	47	107	242	29
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.34		0.08	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	1.09	0.36	0.60	0.68		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.1		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.46	0.37	1.28	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	53.7	1.6	4.1	2.6		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	14.7	64.0	29.0	36.5	27.7		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	B	E	C	D	C		D	C	C	C	C	C
Approach Delay (s)		47.5			28.8			32.7			31.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay		38.1			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		71.9%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	220	321	494	108	207	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	232	338	520	114	218	360	231
RTOR Reduction (vph)	0	67	0	0	177	0	0	75	0	0	174	
Lane Group Flow (vph)	140	655	0	135	620	55	338	520	39	218	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		c0.12	0.19	
v/s Ratio Perm					0.03			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.15	0.94	0.81	0.07	1.22	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	21.0	27.3	20.5	15.2	31.1	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.2	33.1	10.4	0.3	138.0	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	21.2	60.4	30.9	15.4	169.1	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	F	D	C
Approach Delay (s)		39.7			32.5			39.4			68.3	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM Average Control Delay		44.0										
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		69.3										
Intersection Capacity Utilization		77.7%										
Analysis Period (min)		15										
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3517		1770	3539	1583	1770	1660	1660	1770	1649	1649
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	3517		1770	3539	1583	1770	1660	1660	1770	1649	1649
Volume (vph)	102	736	32	53	855	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	775	34	56	900	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	119	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	806	0	56	900	232	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.23		0.03	c0.25		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.15							
v/c Ratio	0.67	0.72		0.58	0.89	0.51	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	27.0		41.6	30.9	27.0	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.62	0.53	0.18	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.9		7.8	10.9	3.7	22.4	1.0		5.7	0.1	
Delay (s)	50.4	30.9		33.6	27.2	8.5	64.9	40.2		30.6	16.7	
Level of Service	D	C		C	C	A	E	D		C	B	
Approach Delay (s)		33.2			22.4			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		28.1										
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		90.0										
Intersection Capacity Utilization		74.6%										
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↓	↑↑					↓	↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	472	99	1017	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	497	104	1071	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	124	0	0	0	0	0	0	0	66	0
Lane Group Flow (vph)	0	862	373	104	1071	0	0	0	0	673	157	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06		c0.30				c0.20	0.10	
v/s Ratio Perm		0.24										
v/c Ratio		0.59	0.57	0.44	0.51					0.61	0.31	
Uniform Delay, d1		20.7	20.5	35.8	10.9					25.7	22.9	
Progression Factor		0.53	0.50	1.38	2.00					1.00	1.00	
Incremental Delay, d2		1.3	2.6	1.2	0.8					1.0	1.6	
Delay (s)		12.3	12.8	50.7	22.7					26.7	24.5	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		12.5		25.2		0.0				26.1		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		20.4		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		62.9%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												




















25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↓↓	↓
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	468	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	493	248
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	1538	0	0	649	493	228
Turn Type				Perm		
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	62.0			62.0	19.0	19.0
Effective Green, g (s)	62.5			62.5	19.5	19.5
Actuated g/C Ratio	0.69			0.69	0.22	0.22
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2458			2458	744	343
v/s Ratio Prot	c0.43			0.18	0.14	
v/s Ratio Perm				c0.14		
v/c Ratio	0.63			0.26	0.66	0.66
Uniform Delay, d1	7.4			5.1	32.2	32.2
Progression Factor	0.56			1.00	1.00	1.00
Incremental Delay, d2	1.0			0.3	2.2	4.8
Delay (s)	5.2			5.4	34.5	37.0
Level of Service	A			A	C	D
Approach Delay (s)	5.2			5.4	35.3	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			12.8	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			62.9%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						















26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	6	11	2	7	216	19	801	20	116	667	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	6	12	2	7	227	20	843	21	122	702	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1527	1853	353	1493	1834	422	706			864		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1527	1853	353	1493	1834	422	706			864		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	90	98	97	88	61	98			84		
cM capacity (veh/h)	39	60	643	67	62	581	888			774		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	237	20	422	422	21	122	468	238			
Volume Left	7	2	20	0	0	0	122	0	0			
Volume Right	12	227	0	0	0	21	0	0	4			
cSH	80	605	888	1700	1700	1700	774	1700	1700			
Volume to Capacity	0.31	0.39	0.02	0.25	0.25	0.01	0.16	0.28	0.14			
Queue Length 95th (ft)	29	46	2	0	0	0	14	0	0			
Control Delay (s)	69.0	17.4	9.1	0.0	0.0	0.0	10.5	0.0	0.0			
Lane LOS	F	C	A				B					
Approach Delay (s)	69.0	17.4	0.2				1.6					
Approach LOS	F	C										
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			48.8%			ICU Level of Service		A				
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	22	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	23	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	24	1								
Volume Left	1	4	23	0								
Volume Right	3	2	1	0								
cSH	1359	1432	594	557								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.1	0.2	11.3	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.3	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			27.9%		ICU Level of Service							
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		27.4%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		32.1%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	→	↖	←	↗	↘	↑	↖	↗	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1363	191	860	568	215	163	279	475	256
v/c Ratio	2.47	0.34	1.44	0.81	0.97	0.56	0.72	0.77	1.00
Control Delay	692.1	36.0	241.0	32.9	122.0	77.8	18.3	69.2	114.2
Queue Delay	10.2	5.3	102.9	30.4	0.0	0.0	2.5	355.3	0.0
Total Delay	702.3	41.3	343.9	63.3	122.0	77.8	20.8	424.5	114.2
Queue Length 50th (ft)	~2376	138	~1311	281	228	87	0	246	250
Queue Length 95th (ft)	#2646	m178n#1491	m379	#402	127	95	#350	#448	
Internal Link Dist (ft)	550	220			110			270	
Turn Bay Length (ft)					150		100	275	
Base Capacity (vph)	551	567	597	698	221	376	418	619	257
Starvation Cap Reductn	0	310	82	154	0	0	0	0	0
Spillback Cap Reductn	77	0	0	0	0	0	60	353	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.88	0.74	1.67	1.04	0.97	0.43	0.78	1.79	1.00
Intersection Summary									
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	↖	→	↗	↖	←	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	169	5	32	228
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.59	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	28.4	24.1	33.4	4.1	3.4	35.8	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	28.4	24.1	33.4	4.1	3.4	35.8	11.3
Queue Length 50th (ft)	2	15	0	2	27	99	4	0	15	24
Queue Length 95th (ft)	13	39	49	m4	m46	m93	m36	m1	40	66
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	400	2462	1102	184	1923
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12
Intersection Summary										
m	Volume for 95th percentile queue is metered by upstream signal.									

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	991	840	94	901	345	1054
v/c Ratio	0.59	0.94	0.37	0.44	0.66	1.23dr
Control Delay	18.1	29.5	45.2	16.8	30.4	46.2
Queue Delay	31.0	160.3	0.0	0.1	0.0	73.4
Total Delay	49.2	189.8	45.2	17.0	30.4	119.6
Queue Length 50th (ft)	197	830	22	156	161	252
Queue Length 95th (ft)	m131	m163	m26	m144	261	#397
Internal Link Dist (ft)	220		466			348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1084
Starvation Cap Reductn	738	277	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	188
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.37	0.37	0.53	0.66	1.18

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	599	738	435	498	358	377	599	44	52
v/c Ratio	0.52	0.82	0.78	0.33	1.03	1.07	0.57	0.12	0.14
Control Delay	42.0	26.0	48.2	16.5	84.7	95.5	7.9	23.2	19.1
Queue Delay	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	32.8	48.2	16.5	84.7	95.5	7.9	23.2	19.1
Queue Length 50th (ft)	142	210	120	110	~149	~174	22	22	23
Queue Length 95th (ft)	162	312	#180	147	m#278	m#300	m38	43	44
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	899	558	1524	347	352	1050	365	381
Starvation Cap Reductn	0	123	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.95	0.78	0.33	1.03	1.07	0.57	0.12	0.14

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1033	718	97	248
v/c Ratio	0.46	0.46	0.45	0.21	0.41
Control Delay	32.0	16.5	16.1	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	32.0	17.0	16.1	24.5	5.8
Queue Length 50th (ft)	62	235	122	38	0
Queue Length 95th (ft)	84	260	178	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1609	465	598
Starvation Cap Reductn	0	741	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.68	0.45	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	398	400	42	16	541	517	7	458	743
v/c Ratio	0.92	0.92	0.10	0.11	1.02	0.25	0.05	0.49	0.81
Control Delay	58.7	58.8	8.3	29.3	74.3	10.6	41.7	30.9	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Total Delay	58.7	58.8	8.3	29.3	74.3	10.6	41.7	30.9	17.3
Queue Length 50th (ft)	202	203	0	5	~278	51	4	127	187
Queue Length 95th (ft)	#372	#375	23	23	#478	147	m4 m#220	#342	
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2064	177	932	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	70
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.90	0.09	0.09	1.02	0.25	0.04	0.49	0.87
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	←	↖	↑	↗	→	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	683	698	264	289	560
v/c Ratio	0.62	1.02	0.90	0.33	1.06	0.48
Control Delay	29.1	53.4	35.9	3.1	103.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	53.4	35.9	3.1	103.5	8.0
Queue Length 50th (ft)	96	~144	248	0	~130	101
Queue Length 95th (ft)	168	#359	#451	38	#264	163
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	672	774	812	272	1175
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.02	0.90	0.33	1.06	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	↖	→	↗	↖	←	↖	↗	↑	↗	↖	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	698	38	213	987	162	67	97	85	284	149
v/c Ratio	0.40	0.93	0.10	0.83	1.06	0.31	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	51.8	9.9	53.3	63.9	2.1	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	51.8	9.9	53.3	63.9	2.1	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	181	0	44	~320	0	16	8	0	118	13
Queue Length 95th (ft)	61	#286	23	m57	m#380	m1	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	518	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.93	0.10	0.83	1.06	0.31	0.26	0.25	0.22	0.53	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.


95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	804	154	391	1073	377	144	435	274	383	278	256
v/c Ratio	0.88	0.48	0.25	0.76	0.94	0.52	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	52.1	11.6	2.1	30.8	30.4	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	11.6	2.1	30.8	30.4	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	76	57	4	96	271	25	71	74	0	95	129	0
Queue Length 95th (ft) m#136	m62	m6	m#148	#402	m33	#157	118	65	#188	#230	58	
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1145	725	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.48	0.25	0.76	0.94	0.52	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1630	72	1460	209	25	370	370	369
v/c Ratio	0.70	0.51	0.73	0.13	0.05	0.84	0.88	0.67
Control Delay	8.6	52.9	12.0	0.1	9.8	43.2	48.5	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	52.9	12.0	0.1	9.8	43.2	48.5	27.4
Queue Length 50th (ft)	132	37	169	0	2	169	172	138
Queue Length 95th (ft)	169	m51	m188	m0	18	#318	#329	230
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2322	142	2000	1583	568	475	455	592
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.51	0.73	0.13	0.04	0.78	0.81	0.62

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1728	287	1049	368	688	161	161	18
v/c Ratio	0.14	0.69	0.18	0.61	0.23	0.97	0.21	0.21	0.02
Control Delay	38.5	23.9	0.2	17.8	0.3	47.6	11.0	11.0	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	23.9	0.2	17.8	0.3	47.6	11.0	11.0	8.3
Queue Length 50th (ft)	10	250	0	94	0	303	42	42	3
Queue Length 95th (ft)	m13	m275	m0	131	m0	#543	76	76	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2491	1583	1722	1583	730	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.69	0.18	0.61	0.23	0.94	0.20	0.20	0.02
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1209	574	148	1003	226	475	236	107	242	193
v/c Ratio	0.51	1.09	0.64	0.60	0.68	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	16.9	70.0	6.0	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	70.0	7.8	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	33	~372	24	69	154	114	120	0	54	62	0
Queue Length 95th (ft)	m65	#487	90	#187	#252	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1107	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	171	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.09	0.80	0.60	0.68	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	232	338	520	114	218	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.42	0.95	0.81	0.18	1.22	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	171.4	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	171.4	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	-119	146	0
Queue Length 95th (ft)	#162	#221	#155	184	50	#296	#358	30	#243	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	560	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.41	0.95	0.81	0.18	1.22	0.79	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	107	809	56	900	351	51	91	511	132	
v/c Ratio	0.67	0.66	0.47	0.84	0.59	0.43	0.44	0.80	0.18	
Control Delay	64.2	31.2	37.2	26.0	6.5	52.2	21.8	35.9	5.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	64.2	31.2	37.2	26.0	6.5	52.2	21.8	35.9	5.8	
Queue Length 50th (ft)	61	227	31	282	9	28	14	237	10	
Queue Length 95th (ft)	#161	#342	m57	#386	25	65	57	#388	43	
Internal Link Dist (ft)		6630		350			200		236	
Turn Bay Length (ft)	225		150		80	50		225		
Base Capacity (vph)	159	1234	118	1077	598	118	367	653	782	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	7	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.67	0.66	0.47	0.84	0.59	0.43	0.25	0.78	0.17	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	497	104	1071	673	223
v/c Ratio	0.58	0.63	0.39	0.51	0.61	0.39
Control Delay	12.7	9.2	51.2	23.1	28.6	15.2
Queue Delay	0.3	0.5	0.0	0.5	0.0	0.0
Total Delay	13.0	9.7	51.2	23.6	28.6	15.2
Queue Length 50th (ft)	118	70	60	273	164	52
Queue Length 95th (ft)	146	m111	m103	337	222	113
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	787	295	2084	1106	577
Starvation Cap Reductn	171	68	0	548	0	0
Spillback Cap Reductn	52	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.69	0.35	0.70	0.61	0.39
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	493	248
v/c Ratio	0.63	0.26	0.66	0.68
Control Delay	5.8	6.2	36.0	37.9
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	6.0	6.2	36.0	37.9
Queue Length 50th (ft)	191	59	135	119
Queue Length 95th (ft)	252	115	162	176
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2456	2456	1221	580
Starvation Cap Reductn	188	0	0	0
Spillback Cap Reductn	0	49	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.27	0.40	0.43
Intersection Summary				

**CUMULATIVE 2020 + ALTERNATIVE B
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	16	317	22	134	14	763	74	223	508	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	14	17	334	23	141	15	803	78	235	535	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1921	1916	536	1899	1879	842	538			881		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1921	1916	536	1899	1879	842	538			881		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	70	97	0	53	61	99			69		
cM capacity (veh/h)	15	46	544	30	49	364	1030			767		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	498	15	881	235	538						
Volume Left	0	334	15	0	235	0						
Volume Right	17	141	0	78	0	3						
cSH	93	42	1030	1700	767	1700						
Volume to Capacity	0.33	11.94	0.01	0.52	0.31	0.32						
Queue Length 95th (ft)	31	Err	1	0	32	0						
Control Delay (s)	61.3	Err	8.5	0.0	11.7	0.0						
Lane LOS	F	F	A		B							
Approach Delay (s)	61.3	Err	0.1		3.6							
Approach LOS	F	F										
Intersection Summary												
Average Delay		2268.3										
Intersection Capacity Utilization		92.4%		ICU Level of Service		F						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	170	131	619	280	9	184	32	804	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	138	652	295	9	194	34	846	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			317			1887	1876	248	2735	1941	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			317			1887	1876	248	2735	1941	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			48			0	0	0	0	66	99
cM capacity (veh/h)	1257			1243			23	34	791	0	31	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	327	956	1074	32								
Volume Left	11	652	194	11								
Volume Right	138	9	846	11								
cSH	1257	1243	104	0								
Volume to Capacity	0.01	0.52	10.35	Err								
Queue Length 95th (ft)	1	79	Err	Err								
Control Delay (s)	0.3	9.8	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.3	9.8	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay		Err										
Intersection Capacity Utilization		145.2%		ICU Level of Service		H						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	964	10	9	890	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1015	11	9	937	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	946			1025			2017	2006	1020	2017	2007	942
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	946			1025			2017	2006	1020	2017	2007	942
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			70	82	96	70	82	97
cM capacity (veh/h)	725			677			35	58	287	35	58	319
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1036	956	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	725	677	61	61								
Volume to Capacity	0.01	0.01	0.52	0.52								
Queue Length 95th (ft)	1	1	52	51								
Control Delay (s)	0.5	0.4	115.2	114.4								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.5	0.4	115.2	114.4								
Approach LOS			F	F								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			67.5%		ICU Level of Service				C			
Analysis Period (min)			15									

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	964	10	9	890	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1015	11	9	937	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	946			1025			2013	2006	1020	2013	2002	937
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	946			1025			2013	2006	1020	2013	2002	937
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			70	82	96	70	82	97
cM capacity (veh/h)	725			677			36	58	287	35	58	321
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	1036	9	937	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	725	677	1700	1700	61	62						
Volume to Capacity	0.01	0.01	0.55	0.01	0.51	0.51						
Queue Length 95th (ft)	1	1	0	0	51	51						
Control Delay (s)	0.5	10.4	0.0	0.0	114.3	113.0						
Lane LOS	A	B			F	F						
Approach Delay (s)	0.5	0.1			114.3	113.0						
Approach LOS					F	F						
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			69.3%		ICU Level of Service				C			
Analysis Period (min)			15									

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱		↱			↱	↱
Sign Control	Free	Free		Free	Free		Stop	Stop		Stop	Stop	
Grade	0%			0%			0%				0%	
Volume (veh/h)	40	903	41	188	855	189	44	14	396	180	31	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	951	43	198	900	199	46	15	417	189	33	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1099			994			1930	2551	497	2379	2473	549
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1099			994			1930	2551	497	2379	2473	549
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			71			0	16	20	0	0	98
cM capacity (veh/h)	631			692			0	18	519	1	20	479
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	42	634	360	198	600	499	478	234				
Volume Left	42	0	0	198	0	0	46	189				
Volume Right	0	0	43	0	0	199	417	12				
cSH	631	1700	1700	692	1700	1700	0	1				
Volume to Capacity	0.07	0.37	0.21	0.29	0.35	0.29	Err	233.78				
Queue Length 95th (ft)	5	0	0	29	0	0	Err	Err				
Control Delay (s)	11.1	0.0	0.0	12.3	0.0	0.0	Err	Err				
Lane LOS	B			B			F	F				
Approach Delay (s)	0.5			1.9			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization				89.9%			ICU Level of Service		E			
Analysis Period (min)				15								

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱		↱			↱	↱
Sign Control	Free	Free		Free	Free		Stop	Stop		Stop	Stop	
Grade	0%			0%			0%				0%	
Volume (veh/h)	53	1153	273	509	970	273	143	105	559	217	41	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	1214	287	536	1021	287	151	111	588	228	43	125
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked												
vC, conflicting volume	1308			1501			3198	3849	751	3598	3849	654
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1308			1501			3198	3849	751	3598	3849	654
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			0			0	0	0	0	0	69
cM capacity (veh/h)	525			442			0	0	354	0	0	409
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	56	809	692	536	681	628	849	397				
Volume Left	56	0	0	536	0	0	151	228				
Volume Right	0	0	287	0	0	287	588	125				
cSH	525	1700	1700	442	1700	1700	0	0				
Volume to Capacity	0.11	0.48	0.41	1.21	0.40	0.37	Err	Err				
Queue Length 95th (ft)	9	0	0	529	0	0	Err	Err				
Control Delay (s)	12.7	0.0	0.0	142.4	0.0	0.0	Err	Err				
Lane LOS	B			F			F	F				
Approach Delay (s)	0.5			41.4			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization				134.2%			ICU Level of Service		H			
Analysis Period (min)				15								

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1648	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1648	
Volume (vph)	157	1517	255	73	962	730	556	103	350	453	70	234
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	165	1597	268	77	1013	768	585	108	368	477	74	246
RTOR Reduction (vph)	0	0	48	0	0	187	0	0	342	0	75	0
Lane Group Flow (vph)	165	1597	220	77	1013	581	585	108	26	477	245	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	
Protected Phases	4	4		8	8	5	2		1	6		
Permitted Phases		4			8		2					
Actuated Green, G (s)	47.5	47.5	47.5	53.5	53.5	53.5	19.5	10.9	10.9	30.1	21.5	
Effective Green, g (s)	48.0	48.0	48.0	54.0	54.0	54.0	20.0	11.4	11.4	30.6	22.0	
Actuated g/C Ratio	0.30	0.30	0.30	0.34	0.34	0.34	0.12	0.07	0.07	0.19	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	531	1017	432	567	597	534	221	252	113	657	227	
v/s Ratio Prot	0.09	c0.47		0.05	c0.57		c0.33	0.03		0.14	c0.15	
v/s Ratio Perm			0.15			0.37		0.02				
v/c Ratio	0.31	1.57	0.51	0.14	1.70	1.09	2.65	0.43	0.23	0.73	1.08	
Uniform Delay, d1	43.2	56.0	46.3	36.8	53.0	53.0	70.0	71.2	70.2	60.8	69.0	
Progression Factor	1.00	1.00	1.00	0.83	0.86	0.90	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	261.4	0.9	0.3	318.4	58.2	754.0	1.2	1.1	4.0	82.4	
Delay (s)	43.6	317.4	47.2	30.9	363.8	106.0	824.0	72.4	71.2	64.8	151.4	
Level of Service	D	F	D	C	F	F	F	E	E	E	F	
Approach Delay (s)		259.5			243.4			486.4			99.5	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		274.0										
HCM Volume to Capacity ratio		1.69										
Actuated Cycle Length (s)		160.0										
Intersection Capacity Utilization		157.5%										
Analysis Period (min)		15										
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.89	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3030	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3030	
Volume (vph)	0	1461	862	77	1062	0	0	0	0	355	288	700
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1538	907	81	1118	0	0	0	0	374	303	737
RTOR Reduction (vph)	0	0	169	0	0	0	0	0	0	0	55	0
Lane Group Flow (vph)	0	1538	738	81	1118	0	0	0	0	374	985	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases		4										
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	985	
v/s Ratio Prot		0.43		0.02	c0.32							
v/s Ratio Perm			c0.47							0.23	0.32	
v/c Ratio		0.94	1.01	0.39	0.55					0.72	1.35dr	
Uniform Delay, d1		20.3	21.4	36.1	10.6					23.7	27.0	
Progression Factor		1.38	1.87	1.21	1.65					1.00	1.00	
Incremental Delay, d2		1.4	11.3	0.7	0.7					8.1	28.6	
Delay (s)		29.4	51.5	44.5	18.1					31.9	55.6	
Level of Service		C	D	D	B					C	E	
Approach Delay (s)		37.6			19.9				0.0		49.3	
Approach LOS		D			B				A		D	
Intersection Summary												
HCM Average Control Delay		36.7										
HCM Volume to Capacity ratio		0.94										
Actuated Cycle Length (s)		80.0								8.0		
Intersection Capacity Utilization		93.9%									F	
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

















10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3520		1681	1689	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3520		1681	1689	2787	1770	1723	
Volume (vph)	0	770	1048	499	455	17	687	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	811	1103	525	479	18	723	19	601	9	9	9
RTOR Reduction (vph)	0	0	594	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	811	509	525	494	0	362	380	124	9	11	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	17.5	17.5	12.5	34.5	34.5		16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0	35.0		16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44	0.44		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1540	1540		347	348	575	365	355	
v/s Ratio Prot	0.16		c0.15	0.14			0.22	c0.22		0.01	c0.01	
v/s Ratio Perm			c0.32						0.04			
v/c Ratio	0.71	1.43	0.94	0.32			1.04	1.09	0.22	0.02	0.03	
Uniform Delay, d1	28.6	31.0	33.1	14.7			31.8	31.8	26.4	25.3	25.4	
Progression Factor	1.47	4.11	1.22	1.25			1.03	1.03	2.50	1.00	1.00	
Incremental Delay, d2	1.7	200.3	21.6	0.5			51.1	66.7	0.6	0.1	0.2	
Delay (s)	43.7	327.6	62.1	18.8			83.8	99.2	66.6	25.5	25.5	
Level of Service	D	F	E	B			F	F	E	C	C	
Approach Delay (s)	207.3			41.1			80.5			25.5		
Approach LOS	F			D			F			C		
Intersection Summary												
HCM Average Control Delay	127.2			HCM Level of Service					F			
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	92.5%			ICU Level of Service					F			
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	 	 	 		 	 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1216	867	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1280	913	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	80
Lane Group Flow (vph)	144	1280	975	0	107	28
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	8.7	50.5	37.3	20.5		
Effective Green, g (s)	9.2	51.0	37.8	21.0		
Actuated g/C Ratio	0.11	0.64	0.47	0.26		
Clearance Time (s)	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	395	2256	1655	465		
v/s Ratio Prot	0.04	c0.36	0.28	c0.06		
v/s Ratio Perm				0.02		
v/c Ratio	0.36	0.57	0.59	0.23		
Uniform Delay, d1	32.7	8.2	15.4	23.2		
Progression Factor	0.80	2.28	1.00	1.00		
Incremental Delay, d2	0.4	0.8	1.5	1.2		
Delay (s)	26.7	19.6	17.0	24.3		
Level of Service	C	B	B	C		
Approach Delay (s)	20.3		17.0	23.4		
Approach LOS	C		B	C		
Intersection Summary						
HCM Average Control Delay	19.3			HCM Level of Service		B
HCM Volume to Capacity ratio	0.47					
Actuated Cycle Length (s)	80.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	45.9%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	841	3	47	8	3	5	552	413	2	7	616	926
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	885	3	49	8	3	5	581	435	2	7	648	975
RTOR Reduction (vph)	0	0	36	0	5	0	0	1	0	0	0	564
Lane Group Flow (vph)	443	445	13	0	11	0	581	436	0	7	648	411
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.5	20.5	20.5		1.5		27.1	38.5		1.5	12.9	12.9
Effective Green, g (s)	21.0	21.0	21.0		2.0		27.6	39.0		2.0	13.4	13.4
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	441	443	416		44		611	1724		44	593	265
v/s Ratio Prot	0.26	c0.26			c0.01		c0.33	0.12		0.00	0.18	
v/s Ratio Perm			0.01									c0.26
v/c Ratio	1.00	1.00	0.03		0.25		0.95	0.25		0.16	1.09	1.55
Uniform Delay, d1	29.5	29.5	21.9		38.3		25.5	12.0		38.2	33.3	33.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.19	1.15	1.99
Incremental Delay, d2	44.0	43.9	0.0		3.0		24.8	0.4		0.2	44.7	250.3
Delay (s)	73.5	73.4	22.0		41.3		50.3	12.3		45.7	83.1	316.6
Level of Service	E	E	C		D		D	B		D	F	F
Approach Delay (s)		70.7			41.3			34.0			222.6	
Approach LOS		E			D			C			F	
Intersection Summary												
HCM Average Control Delay		129.0								F		
HCM Volume to Capacity ratio		1.07										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		101.3%								G		
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↰	↰			↰
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	86	765	480	0	838
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	91	805	505	0	882
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1940	1058			1311	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1940	1058			1311	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	67			100	
cM capacity (veh/h)	72	273			528	
Direction, Lane #						
Volume Total	91	1311	882			
Volume Left	0	0	0			
Volume Right	91	505	0			
cSH	273	1700	1700			
Volume to Capacity	0.33	0.77	0.52			
Queue Length 95th (ft)	35	0	0			
Control Delay (s)	24.6	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	24.6	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		81.5%			ICU Level of Service	D
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↩	↩	↩	↩	↩	↩
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	144	31	12	359	363	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	152	33	13	378	382	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609	204	408			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609	204	408			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	96	99			
cM capacity (veh/h)	422	803	1147			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	152	33	13	189	189	255 154
Volume Left	152	0	13	0	0	0 0
Volume Right	0	33	0	0	0	0 26
cSH	422	803	1147	1700	1700	1700 1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15 0.09
Queue Length 95th (ft)	40	3	1	0	0	0 0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	16.7		0.3			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			25.5%		ICU Level of Service	A
Analysis Period (min)			15			

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↩	↩	↩	↩	↩	↩
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	580	664	253	268	571
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	611	699	266	282	601
RTOR Reduction (vph)	0	289	0	153	0	0
Lane Group Flow (vph)	266	322	699	113	282	601
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	14.2	14.2	26.6	26.6	9.5	40.6
Effective Green, g (s)	14.7	14.7	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.23	0.23	0.42	0.42	0.16	0.64
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	408	365	791	672	277	1200
v/s Ratio Prot	0.15		c0.38		c0.16	0.32
v/s Ratio Perm		c0.20		0.07		
v/c Ratio	0.65	0.88	0.88	0.17	1.02	0.50
Uniform Delay, d1	22.2	23.7	16.9	11.4	26.9	6.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	21.4	13.7	0.5	58.8	1.5
Delay (s)	25.9	45.1	30.6	11.9	85.7	7.5
Level of Service	C	D	C	B	F	A
Approach Delay (s)	39.3		25.4			32.4
Approach LOS	D		C			C
Intersection Summary						
HCM Average Control Delay			32.2		HCM Level of Service	C
HCM Volume to Capacity ratio			0.91			
Actuated Cycle Length (s)			63.8		Sum of lost time (s)	12.0
Intersection Capacity Utilization			77.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	648	53	116	855	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	682	56	122	900	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	44	0	0	72	0	57	70	0	55	0
Lane Group Flow (vph)	87	682	12	122	900	25	73	42	19	296	89	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	16.6	16.6	4.4	16.6	16.6	4.4	16.6	16.6	24.4	36.6	
Effective Green, g (s)	4.9	17.1	17.1	4.9	17.1	17.1	4.9	17.1	17.1	24.9	37.1	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.21	0.21	0.31	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	756	338	210	756	338	210	337	321	551	772	
v/s Ratio Prot	0.05	c0.19		0.04	c0.25		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.02			0.01			
v/c Ratio	0.81	0.90	0.04	0.58	1.19	0.08	0.35	0.13	0.06	0.54	0.12	
Uniform Delay, d1	37.1	30.6	24.9	36.6	31.4	25.1	36.0	25.4	25.0	22.8	12.2	
Progression Factor	1.00	1.00	1.00	1.01	0.51	0.21	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	33.9	14.0	0.0	2.2	93.1	0.1	1.0	0.8	0.4	1.0	0.3	
Delay (s)	70.9	44.6	25.0	39.2	109.3	5.2	37.0	26.2	25.4	23.8	12.5	
Level of Service	E	D	C	D	F	A	D	C	C	C	B	
Approach Delay (s)		46.1			92.6			28.9			20.1	
Approach LOS		D			F			C			C	
Intersection Summary												
HCM Average Control Delay		59.8			HCM Level of Service			E				
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		61.6%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Volume (vph)	216	763	163	377	966	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	803	172	397	1017	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	200	0	70	265	0	0	198
Lane Group Flow (vph)	227	803	57	397	1017	135	182	443	102	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.16		0.12	c0.29		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.09			0.07			0.03
v/c Ratio	0.81	0.48	0.11	0.77	0.89	0.26	0.87	0.71	0.36	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.4	18.7	32.7	25.9	20.1	34.6	30.1	28.0	34.0	30.7	26.3
Progression Factor	0.78	0.55	0.43	0.75	0.70	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.4	0.7	0.3	5.2	8.3	0.9	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	37.7	12.5	8.3	29.9	26.4	9.5	63.7	33.9	28.8	45.1	46.1	26.5
Level of Service	D	B	A	C	C	A	E	C	C	D	D	C
Approach Delay (s)		16.7			24.0			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		28.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		77.4%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2020 + Alternative B

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑↑↑	↑↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Flt	0.97	1.00	1.00	0.85	1.00	0.85	0.90	1.00	1.00	0.85	0.85	0.85
Flt Protected	1.00	0.95	1.00	1.00	1.00	0.99	0.99	0.95	0.95	1.00	1.00	1.00
Satd. Flow (prot)	4920	1770	3539	1583	1583	1653	1681	1686	1583	1583	1583	1583
Flt Permitted	1.00	0.95	1.00	1.00	1.00	0.93	0.74	0.71	1.00	1.00	1.00	1.00
Satd. Flow (perm)	4920	1770	3539	1583	1583	1549	1312	1255	1583	1583	1583	1583
Volume (vph)	0	1263	349	68	1225	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1329	367	72	1289	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	57	0	0	0	0	0	12	0	0	0	29
Lane Group Flow (vph)	0	1639	0	72	1289	268	0	12	0	322	322	420
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases	4			3	8			2			6	
Permitted Phases					Free	2				6		6
Actuated Green, G (s)	36.7			4.8	46.0	80.0		25.0		25.0	25.0	25.0
Effective Green, g (s)	37.2			5.3	46.5	80.0		25.5		25.5	25.5	25.5
Actuated g/C Ratio	0.47			0.07	0.58	1.00		0.32		0.32	0.32	0.32
Clearance Time (s)	4.5			4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2288			117	2057	1583		494		418	400	505
v/s Ratio Prot	c0.33			0.04	c0.36							
v/s Ratio Perm						0.17		0.01		0.25	0.26	c0.27
v/c Ratio	0.72			0.62	0.63	0.17		0.02		0.77	0.81	0.83
Uniform Delay, d1	17.2			36.4	11.0	0.0		18.7		24.6	25.0	25.3
Progression Factor	0.45			1.17	0.82	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5			6.1	0.9	0.2		0.0		8.5	11.2	11.1
Delay (s)	9.2			48.8	10.0	0.2		18.7		33.1	36.2	36.4
Level of Service	A			D	B	A		B		C	D	D
Approach Delay (s)	9.2				10.1			18.7			35.4	
Approach LOS	A				B			B			D	
Intersection Summary												
HCM Average Control Delay	16.0					HCM Level of Service		B				
HCM Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	80.0					Sum of lost time (s)		12.0				
Intersection Capacity Utilization	73.6%					ICU Level of Service		D				
Analysis Period (min)	15											
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2020 + Alternative B

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑	↑↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	0.85	0.85	0.85	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	6408	1583	5085	1583	1770	1504	1504	1748	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.84	0.84	0.84	0.84
Satd. Flow (perm)	1770	6408	1583	5085	1583	1389	1504	1504	1522	1522	1522	1522
Volume (vph)	21	1567	298	0	853	383	690	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1649	314	0	898	403	726	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	1	1	0	1	0	0
Lane Group Flow (vph)	22	1649	314	0	898	403	726	180	181	0	17	0
Turn Type				Prot	Free	Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				Free		Free	2		2		6	
Actuated Green, G (s)	2.2	29.5	80.0		22.8	80.0	41.5	41.5	41.5		41.5	
Effective Green, g (s)	2.7	30.0	80.0		23.3	80.0	42.0	42.0	42.0		42.0	
Actuated g/C Ratio	0.03	0.38	1.00		0.29	1.00	0.52	0.52	0.52		0.52	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	2403	1583		1481	1583	729	790	790		799	
v/s Ratio Prot	0.01	c0.26			0.18		0.12					
v/s Ratio Perm			0.20			0.25	c0.52		0.12		0.01	
v/c Ratio	0.37	0.69	0.20		0.61	0.25	1.00	0.23	0.23		0.02	
Uniform Delay, d1	37.8	21.0	0.0		24.4	0.0	18.9	10.3	10.3		9.1	
Progression Factor	1.10	1.19	1.00		0.73	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.5	1.1	0.2		1.4	0.3	32.1	0.1	0.1		0.0	
Delay (s)	44.3	26.1	0.2		19.1	0.3	51.0	10.4	10.4		9.1	
Level of Service	D	C	A		B	A	D	B	B		A	
Approach Delay (s)	22.2				13.3		37.5				9.1	
Approach LOS	C				B		D				A	
Intersection Summary												
HCM Average Control Delay	23.3					HCM Level of Service		C				
HCM Volume to Capacity ratio	0.87											
Actuated Cycle Length (s)	80.0					Sum of lost time (s)		8.0				
Intersection Capacity Utilization	72.3%					ICU Level of Service		C				
Analysis Period (min)	15											
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4913	1610	3330	1583	1610	3387	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4913	1610	3330	1583	1610	3387	1583	1583
Volume (vph)	235	1232	462	165	694	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1297	486	174	731	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	346	0	62	0	0	204	0	0	131	0
Lane Group Flow (vph)	247	1297	140	174	882	0	229	483	50	181	380	29
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Perm
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	12.6	22.6	22.6	10.0	20.0	15.4	15.4	15.4	14.0	14.0	14.0	14.0
Effective Green, g (s)	13.1	23.1	23.1	10.5	20.5	15.9	15.9	15.9	14.5	14.5	14.5	14.5
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.26	0.20	0.20	0.20	0.18	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	562	1022	457	232	1259	320	662	315	292	614	287	287
v/s Ratio Prot	0.07	c0.37	0.10	c0.18	0.14	c0.15	c0.11	0.11	0.11	0.11	0.11	0.11
v/s Ratio Perm	0.44	1.27	0.31	0.75	0.70	0.72	0.73	0.16	0.62	0.62	0.62	0.10
Uniform Delay, d1	30.1	28.4	22.2	33.5	27.0	29.9	30.0	26.5	30.2	30.2	27.3	27.3
Progression Factor	0.43	0.38	0.39	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	127.4	1.4	12.8	3.3	7.4	4.0	0.2	3.9	1.9	0.2	0.2
Delay (s)	13.6	138.2	10.1	46.2	30.2	37.4	34.1	26.8	34.1	32.1	27.5	27.5
Level of Service	B	F	B	D	C	D	C	C	C	C	C	C
Approach Delay (s)	92.4	92.4	32.7	32.7	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6
Approach LOS	F	F	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	57.6	57.6	HCM Level of Service	E	E	E	E	E	E	E	E	E
HCM Volume to Capacity ratio	0.91	0.91	Sum of lost time (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Actuated Cycle Length (s)	80.0	80.0	ICU Level of Service	D	D	D	D	D	D	D	D	D
Intersection Capacity Utilization	79.4%	79.4%	Analysis Period (min)	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Volume (vph)	149	583	228	140	661	230	323	483	113	218	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	242	340	508	119	229	377	247
RTOR Reduction (vph)	0	59	0	0	183	0	0	78	0	0	181	0
Lane Group Flow (vph)	157	795	0	147	696	59	340	508	41	229	377	66
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	5.5	16.5	5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5	16.5
Effective Green, g (s)	6.0	17.0	6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24	0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	823	152	859	384	354	639	543	177	452	384	384
v/s Ratio Prot	c0.09	c0.23	0.08	0.20	c0.19	c0.27	c0.13	0.20	0.20	0.20	0.20	0.20
v/s Ratio Perm	1.03	0.97	0.97	0.81	0.15	0.96	0.79	0.08	1.29	0.83	0.17	0.17
Uniform Delay, d1	32.0	26.2	31.9	25.0	20.8	27.7	20.8	15.5	31.5	25.2	20.9	20.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.0	23.1	62.4	5.8	0.2	37.3	9.9	0.3	167.5	16.4	1.0	1.0
Delay (s)	114.0	49.3	94.3	30.8	21.0	65.0	30.6	15.8	199.0	41.6	21.9	21.9
Level of Service	F	D	F	C	C	E	C	B	F	D	C	C
Approach Delay (s)	59.4	59.4	37.2	37.2	40.9	40.9	40.9	40.9	40.9	40.9	40.9	40.9
Approach LOS	E	E	D	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM Average Control Delay	52.8	52.8	HCM Level of Service	D	D	D	D	D	D	D	D	D
HCM Volume to Capacity ratio	0.90	0.90	Sum of lost time (s)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Actuated Cycle Length (s)	70.0	70.0	ICU Level of Service	D	D	D	D	D	D	D	D	D
Intersection Capacity Utilization	82.0%	82.0%	Analysis Period (min)	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3519		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3519		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	819	32	53	914	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	862	34	56	962	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	3	0	0	0	145	0	57	0	0	61	0
Lane Group Flow (vph)	128	893	0	56	962	282	51	34	0	623	84	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.5	21.8		4.4	20.7	20.7	3.3	6.4		39.4	42.5	
Effective Green, g (s)	6.0	22.3		4.9	21.2	21.2	3.8	6.9		39.9	43.0	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	872		96	834	373	75	128		785	783	
v/s Ratio Prot	0.07	c0.25		0.03	c0.27		c0.03	0.02		c0.35	c0.05	
v/s Ratio Perm						0.18						
v/c Ratio	1.08	1.02		0.58	1.15	0.76	0.68	0.26		0.79	0.11	
Uniform Delay, d1	42.0	33.9		41.6	34.4	32.0	42.5	39.2		21.5	12.9	
Progression Factor	1.00	1.00		0.67	0.59	0.27	1.00	1.00		1.00	1.00	
Incremental Delay, d2	107.4	36.7		7.4	80.8	11.4	22.4	1.1		5.5	0.1	
Delay (s)	149.4	70.6		35.4	100.9	20.1	64.9	40.3		27.1	13.0	
Level of Service	F	E		D	F	C	E	D		C	B	
Approach Delay (s)		80.4			74.5			49.1			24.4	
Approach LOS		F			E			D			C	
Intersection Summary												
HCM Average Control Delay		63.8										
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		90.0						20.0				
Intersection Capacity Utilization		81.9%										
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	953	523	66	1115	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	551	69	1174	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	52	0
Lane Group Flow (vph)	0	1003	432	69	1174	0	0	0	0	674	220	0
Turn Type				Perm	Prot					Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.33					c0.20	0.14	
v/s Ratio Perm			0.27									
v/c Ratio		0.69	0.67	0.29	0.56					0.61	0.43	
Uniform Delay, d1		21.9	21.6	35.1	11.4					25.7	24.0	
Progression Factor		0.44	0.42	1.26	1.68					1.00	1.00	
Incremental Delay, d2		1.4	2.7	0.6	1.0					1.0	2.6	
Delay (s)		11.0	11.8	44.9	20.1					26.7	26.7	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		11.3			21.5				0.0		26.7	
Approach LOS		B			C				A		C	
Intersection Summary												
HCM Average Control Delay		18.6										
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		90.0								8.0		
Intersection Capacity Utilization		67.7%										
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	492	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	518	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	518	273
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases					2	
Actuated Green, G (s)	60.0			60.0	21.0	21.0
Effective Green, g (s)	60.5			60.5	21.5	21.5
Actuated g/C Ratio	0.67			0.67	0.24	0.24
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2379			2379	820	378
v/s Ratio Prot	c0.47			0.20	0.15	
v/s Ratio Perm					c0.17	
v/c Ratio	0.71			0.30	0.63	0.72
Uniform Delay, d1	9.2			6.1	30.7	31.5
Progression Factor	0.37			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.3	1.6	6.7
Delay (s)	4.8			6.4	32.3	38.2
Level of Service	A			A	C	D
Approach Delay (s)	4.8			6.4	34.4	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay		12.6			HCM Level of Service	B
HCM Volume to Capacity ratio		0.71				
Actuated Cycle Length (s)		90.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		67.7%			ICU Level of Service	C
Analysis Period (min)		15				
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↑	↗	↖	↖	↕
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	11	5	8	23	25	241	7	814	26	132	706	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	5	8	24	26	254	7	857	27	139	743	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1608	1924	375	1532	1900	428	751			884		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1608	1924	375	1532	1900	428	751			884		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	46	90	99	61	53	56	99			82		
cM capacity (veh/h)	21	54	622	62	55	575	855			761		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	304	7	428	428	27	139	495	255			
Volume Left	12	24	7	0	0	0	139	0	0			
Volume Right	8	254	0	0	0	27	0	0	7			
cSH	38	354	855	1700	1700	1700	761	1700	1700			
Volume to Capacity	0.66	0.86	0.01	0.25	0.25	0.02	0.18	0.29	0.15			
Queue Length 95th (ft)	59	201	1	0	0	0	17	0	0			
Control Delay (s)	204.7	45.4	9.2	0.0	0.0	0.0	10.8	0.0	0.0			
Lane LOS	F	E	A				B					
Approach Delay (s)	204.7	45.4	0.1				1.7					
Approach LOS	F	E										
Intersection Summary												
Average Delay			9.7									
Intersection Capacity Utilization			50.8%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	265	2	23	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	24	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	26	1								
Volume Left	1	7	24	0								
Volume Right	5	2	2	0								
cSH	1281	1402	519	488								
Volume to Capacity	0.00	0.01	0.05	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.1	0.2	12.3	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.3	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization		33.6%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			193			493	493	181	521	505	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			193			493	493	181	521	505	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			75	100	97	100	100	100
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	193	275	147	0								
Volume Left	0	38	120	0								
Volume Right	24	0	27	0								
cSH	1330	1381	519	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	29	0								
Control Delay (s)	0.0	1.3	14.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.3	14.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		41.6%			ICU Level of Service				A			
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	165	1597	268	77	1013	768	585	108	368	477	320
v/c Ratio	0.31	1.57	0.56	0.14	1.70	1.06	2.65	0.43	0.81	0.73	1.06
Control Delay	45.2	298.0	39.4	31.2	348.7	74.9	778.1	75.6	20.8	68.1	114.2
Queue Delay	0.0	364.3	0.0	0.0	103.0	67.6	0.0	0.0	27.1	421.4	0.0
Total Delay	45.2	662.3	39.4	31.2	451.7	142.5	778.1	75.6	47.8	489.4	114.2
Queue Length 50th (ft)	134	~1296	194	49	~1670	~707	~1028	58	0	243	~284
Queue Length 95th (ft)	203	#1442	304	m73m	#1795	m#829	#1271	89	110	#350	#490
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	481	567	597	722	221	376	497	656	302
Starvation Cap Reductn	0	0	0	0	71	95	0	0	0	0	0
Spillback Cap Reductn	0	346	0	0	0	0	0	0	135	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	2.38	0.56	0.14	1.93	1.22	2.65	0.29	1.02	1.93	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1538	907	81	1118	374	1040
v/c Ratio	0.91	0.99	0.32	0.55	0.72	1.35dr
Control Delay	29.2	32.6	44.9	18.5	32.9	54.6
Queue Delay	162.2	118.6	0.0	0.3	0.0	92.5
Total Delay	191.3	151.2	44.9	18.8	32.9	147.1
Queue Length 50th (ft)	850	~925	19	269	179	264
Queue Length 95th (ft)	m260	m111	m26	m233	#292	#413
Internal Link Dist (ft)		220		466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	918	257	2035	523	1040
Starvation Cap Reductn	553	213	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	196
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.36	1.29	0.32	0.66	0.72	1.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	811	1103	525	497	362	380	601	9	18
v/c Ratio	0.71	1.16	0.94	0.32	1.04	1.09	0.57	0.02	0.05
Control Delay	43.8	102.5	64.9	18.9	85.9	99.4	8.3	25.7	18.8
Queue Delay	0.0	84.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	43.8	186.7	64.9	18.9	85.9	99.4	8.7	25.7	18.8
Queue Length 50th (ft)	0	~1080	148	127	~153	~212	35	4	4
Queue Length 95th (ft)	m0	m#1434	#240	175	m#251	m#269	m34	16	21
Internal Link Dist (ft)	466		345		380			270	
Turn Bay Length (ft)			150		150		200		
Base Capacity (vph)	1144	951	558	1544	347	349	1052	365	363
Starvation Cap Reductn	0	134	0	0	0	0	0	0	0
Spillback Cap Reductn	0	21	0	0	0	0	124	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.35	0.94	0.32	1.04	1.09	0.65	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1280	980	107	108
v/c Ratio	0.37	0.57	0.59	0.23	0.22
Control Delay	28.0	19.8	17.4	24.8	6.3
Queue Delay	0.0	1.8	0.0	0.0	0.0
Total Delay	28.0	21.6	17.4	24.8	6.3
Queue Length 50th (ft)	40	289	177	42	0
Queue Length 95th (ft)	m56	323	251	83	36
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1663	465	495
Starvation Cap Reductn	0	762	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.86	0.59	0.23	0.22
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	443	445	49	16	581	437	7	648	975
v/c Ratio	1.00	1.00	0.11	0.11	1.09	0.21	0.05	0.71	1.07
Control Delay	76.2	76.1	7.9	29.3	96.8	10.5	39.9	33.6	50.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4
Total Delay	76.2	76.1	7.9	29.3	96.8	10.5	39.9	33.6	82.4
Queue Length 50th (ft)	~234	~236	0	5	~333	42	3	168	~392
Queue Length 95th (ft)	#430	#432	25	23	#524	124	m3	m#267	m#496
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	452	179	531	2044	177	912	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.00	0.11	0.09	1.09	0.21	0.04	0.71	1.15
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	611	699	266	282	601
v/c Ratio	0.65	0.94	0.88	0.32	1.01	0.50
Control Delay	30.5	34.2	33.6	3.1	90.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	34.2	33.6	3.1	90.2	8.1
Queue Length 50th (ft)	94	89	249	0	~124	111
Queue Length 95th (ft)	164	#289	#453	38	#257	180
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	672	790	824	278	1199
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.91	0.88	0.32	1.01	0.50
Intersection Summary						
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	682	56	122	900	97	73	99	89	296	144
v/c Ratio	0.65	0.90	0.15	0.47	1.19	0.24	0.28	0.23	0.21	0.56	0.17
Control Delay	60.6	48.3	8.8	39.7	114.5	2.3	38.1	12.0	7.8	28.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	48.3	8.8	39.7	114.5	2.3	38.1	12.0	7.8	28.4	5.5
Queue Length 50th (ft)	43	176	0	23	~272	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#276	29	m31	m#345	m1	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	755	381	257	755	409	257	428	424	531	863
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.90	0.15	0.47	1.19	0.24	0.28	0.23	0.21	0.56	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	803	172	397	1017	335	182	513	367	357	317	248
v/c Ratio	0.81	0.48	0.27	0.77	0.90	0.47	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	44.4	12.7	2.3	33.7	28.3	3.5	73.5	31.9	12.0	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	12.7	2.3	33.7	28.3	3.5	73.5	31.9	12.0	51.7	51.3	7.3
Queue Length 50th (ft)	70	58	4	110	290	24	92	108	16	92	151	0
Queue Length 95th (ft)	m#113	m66	m8	m#150	m#373	m29	#210	163	106	#172	#279	57
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1135	709	210	753	565	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.48	0.27	0.77	0.90	0.47	0.87	0.68	0.65	0.81	0.80	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1696	72	1289	268	24	322	322	449
v/c Ratio	0.71	0.50	0.63	0.17	0.05	0.77	0.81	0.84
Control Delay	9.1	50.8	10.9	0.1	9.5	37.1	40.7	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	50.8	10.9	0.1	9.5	37.1	40.7	37.6
Queue Length 50th (ft)	145	36	167	0	2	141	143	176
Queue Length 95th (ft)	182	m53	m185	m0	17	238	#267	#302
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2398	143	2057	1583	576	476	455	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.50	0.63	0.17	0.04	0.68	0.71	0.75
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1649	314	898	403	726	181	182	18
v/c Ratio	0.17	0.69	0.20	0.54	0.25	0.99	0.23	0.23	0.02
Control Delay	40.6	26.4	0.2	17.9	0.3	53.5	11.1	11.1	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	26.4	0.2	17.9	0.3	53.5	11.1	11.1	8.3
Queue Length 50th (ft)	12	250	0	76	0	338	47	47	3
Queue Length 95th (ft)	m16	265	m0	119	m0	#587	85	86	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2403	1583	1653	1583	730	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.69	0.20	0.54	0.25	0.99	0.23	0.23	0.02
Intersection Summary									
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1297	486	174	944	229	483	254	181	380	160
v/c Ratio	0.44	1.27	0.61	0.75	0.71	0.71	0.73	0.49	0.62	0.62	0.38
Control Delay	15.3	145.6	3.8	60.0	29.4	43.2	36.9	7.4	39.4	34.4	7.7
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	145.6	4.7	60.0	29.4	43.2	36.9	7.4	39.4	34.4	7.7
Queue Length 50th (ft)	30	~434	0	88	148	116	123	0	91	96	0
Queue Length 95th (ft)	m55	#536	19	#222	#219	#214	176	58	158	138	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1020	802	231	1322	342	707	536	342	720	462
Starvation Cap Reductn	0	0	121	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.27	0.71	0.75	0.71	0.67	0.68	0.47	0.53	0.53	0.35
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	242	340	508	119	229	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.43	0.96	0.79	0.19	1.29	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	198.5	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	198.5	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	~129	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	51	#298	#346	31	#255	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	568	354	639	621	177	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.43	0.96	0.79	0.19	1.29	0.83	0.44
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	↖	→	↗	←	↖	↗	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	896	56	962	427	51	91	623	145
v/c Ratio	1.08	0.91	0.47	1.06	0.78	0.43	0.44	0.81	0.17
Control Delay	150.1	47.7	38.9	68.6	15.0	52.2	22.9	34.4	5.2
Queue Delay	0.0	1.2	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	150.1	48.9	38.9	68.6	15.6	52.2	22.9	34.4	5.2
Queue Length 50th (ft)	~82	266	29	~327	8	28	16	310	9
Queue Length 95th (ft)	#194	#401	m54	#430	#261	65	59	#556	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	118	980	118	904	546	118	366	767	844
Starvation Cap Reductn	0	0	0	0	15	0	0	0	0
Spillback Cap Reductn	0	19	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.93	0.47	1.06	0.80	0.43	0.25	0.81	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	→	↗	↖	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	551	69	1174	674	272
v/c Ratio	0.67	0.71	0.27	0.56	0.61	0.48
Control Delay	11.3	9.3	44.1	20.5	28.6	20.6
Queue Delay	0.4	0.9	0.0	0.4	0.0	0.0
Total Delay	11.8	10.2	44.1	20.9	28.6	20.6
Queue Length 50th (ft)	144	93	38	296	164	86
Queue Length 95th (ft)	m165	m123	m72	362	222	161
Internal Link Dist (ft)		350		370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	781	295	2084	1106	562
Starvation Cap Reductn	141	70	0	399	0	0
Spillback Cap Reductn	47	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.77	0.23	0.70	0.61	0.48
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	518	287
v/c Ratio	0.71	0.30	0.63	0.73
Control Delay	5.4	7.3	33.4	39.9
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	5.4	7.4	33.4	39.9
Queue Length 50th (ft)	189	75	138	143
Queue Length 95th (ft)	250	142	162	201
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2378	2378	1221	574
Starvation Cap Reductn	60	0	0	0
Spillback Cap Reductn	0	143	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.32	0.42	0.50
Intersection Summary				

**NEAR-TERM 2008 + ALTERNATIVE C
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	8	14	332	13	172	12	758	317	196	514	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	349	14	181	13	798	334	206	541	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1876	2112	543	1963	1947	965	544			1132		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1876	2112	543	1963	1947	965	544			1132		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	75	97	0	68	41	99			67		
cM capacity (veh/h)	13	33	540	28	43	309	1025			617		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	544	13	1132	206	544						
Volume Left	0	349	13	0	206	0						
Volume Right	15	181	0	334	0	3						
cSH	83	40	1025	1700	617	1700						
Volume to Capacity	0.28	13.53	0.01	0.67	0.33	0.32						
Queue Length 95th (ft)	26	Err	1	0	37	0						
Control Delay (s)	64.3	Err	8.6	0.0	13.7	0.0						
Lane LOS	F	F	A		B							
Approach Delay (s)	64.3	Err	0.1		3.8							
Approach LOS	F	F										
Intersection Summary												
Average Delay		2211.9										
Intersection Capacity Utilization		105.8%		ICU Level of Service		G						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	507	10	10	502	10	10	21	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	534	11	11	528	11	11	22	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	539			544			1131	1120	539	1136	1120	534
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	539			544			1131	1120	539	1136	1120	534
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			94	89	98	93	95	98
cM capacity (veh/h)	1029			1025			168	202	543	158	202	546
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	555	549	43	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1029	1025	225	229								
Volume to Capacity	0.01	0.01	0.19	0.14								
Queue Length 95th (ft)	1	1	17	12								
Control Delay (s)	0.3	0.3	24.7	23.2								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.3	24.7	23.2								
Approach LOS			C	C								
Intersection Summary												
Average Delay		1.8										
Intersection Capacity Utilization		42.4%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	131	386	846	200	20	311	32	752	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	406	891	211	21	327	34	792	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232			544			2380	2375	341	3173	2567	221
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			544			2380	2375	341	3173	2567	221
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			13			0	0	0	0	0	99
cM capacity (veh/h)	1336			1025			0	5	701	0	3	819
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	555	1122	1153	32								
Volume Left	11	891	327	11								
Volume Right	406	21	792	11								
cSH	1336	1025	0	0								
Volume to Capacity	0.01	0.87	Err	Err								
Queue Length 95th (ft)	1	293	Err	Err								
Control Delay (s)	0.2	26.4	Err	Err								
Lane LOS	A	D	F	F								
Approach Delay (s)	0.2	26.4	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization		171.6%			ICU Level of Service		H					
Analysis Period (min)		15										

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	872	10	10	1036	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	918	11	11	1091	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1101			928			2077	2066	923	2077	2066	1096
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1101			928			2077	2066	923	2077	2066	1096
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			66	80	97	67	80	96
cM capacity (veh/h)	634			737			31	53	327	31	53	260
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	939	1112	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	634	737	55	55								
Volume to Capacity	0.02	0.01	0.57	0.57								
Queue Length 95th (ft)	1	1	56	57								
Control Delay (s)	0.5	0.5	134.2	136.3								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.5	0.5	134.2	136.3								
Approach LOS			F	F								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization		71.1%			ICU Level of Service		C					
Analysis Period (min)		15										

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	60	755	77	116	995	99	35	6	266	112	21	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	795	81	122	1047	104	37	6	280	118	22	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1152			876			2331	2357	835	2588	2346	1099
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1152			876			2331	2357	835	2588	2346	1099
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			84			0	76	24	0	19	94
cM capacity (veh/h)	607			771			7	27	367	3	27	258
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	939	1274	323	155								
Volume Left	63	122	37	118								
Volume Right	81	104	280	15								
cSH	607	771	50	3								
Volume to Capacity	0.10	0.16	6.52	44.91								
Queue Length 95th (ft)	9	14	Err	Err								
Control Delay (s)	3.1	5.7	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	3.1	5.7	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay		1779.8										
Intersection Capacity Utilization		129.8%		ICU Level of Service		H						
Analysis Period (min)		15										

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	52	933	148	187	1083	89	80	45	222	88	13	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	55	982	156	197	1140	94	84	47	234	93	14	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked	0.67						0.67	0.67		0.67	0.67	0.67
vC, conflicting volume	1234			1138			2806	2797	1060	3007	2828	1187
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1349			1138			3694	3680	1060	3994	3726	1279
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			68			0	0	14	0	0	64
cM capacity (veh/h)	342			614			0	2	272	0	2	136
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1193	1431	365	156								
Volume Left	55	197	84	93								
Volume Right	156	94	234	49								
cSH	342	614	0	0								
Volume to Capacity	0.16	0.32	Err	Err								
Queue Length 95th (ft)	14	34	Err	Err								
Control Delay (s)	8.9	15.6	Err	Err								
Lane LOS	A	C	F	F								
Approach Delay (s)	8.9	15.6	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay		Err										
Intersection Capacity Utilization		162.2%		ICU Level of Service		H						
Analysis Period (min)		15										

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Flt	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1821			1681	1770	1583	1770	3539	1583	3433	1734	
Flt Permitted	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1821			1681	1770	1583	1770	3539	1583	3433	1734	
Volume (vph)	105	971	166	181	1043	540	204	155	265	451	131	112
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	1022	175	191	1098	568	215	163	279	475	138	118
RTOR Reduction (vph)	0	4	0	0	0	128	0	0	256	0	19	0
Lane Group Flow (vph)	0	1305	0	191	1098	440	215	163	23	475	237	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases					8			2				
Actuated Green, G (s)	47.5			53.5	53.5	53.5	19.5	12.7	12.7	28.3	21.5	
Effective Green, g (s)	48.0			54.0	54.0	54.0	20.0	13.2	13.2	28.8	22.0	
Actuated g/C Ratio	0.30			0.34	0.34	0.34	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)	4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	546			567	597	534	221	292	131	618	238	
v/s Ratio Prot	c0.72			0.11	c0.62		c0.12	0.05		0.14	c0.14	
v/s Ratio Perm					0.28			0.01				
v/c Ratio	2.39			0.34	1.84	0.82	0.97	0.56	0.18	0.77	1.00	
Uniform Delay, d1	56.0			39.6	53.0	48.6	69.7	70.6	68.3	62.4	69.0	
Progression Factor	1.00			0.83	0.86	0.85	1.00	1.00	1.00	0.96	0.96	
Incremental Delay, d2	630.8			1.1	382.0	9.4	52.5	2.3	0.6	5.7	56.7	
Delay (s)	686.8			34.1	427.4	50.7	122.2	72.9	69.0	65.7	122.9	
Level of Service	F			C	F	D	F	E	E	E	F	
Approach Delay (s)	686.8				271.7			87.4			85.8	
Approach LOS	F				F			F			F	
Intersection Summary												
HCM Average Control Delay		334.5										F
HCM Volume to Capacity ratio		1.77										
Actuated Cycle Length (s)		160.0				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		160.3%				ICU Level of Service		H				
Analysis Period (min)		15										
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Flt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528	
Volume (vph)	5	30	140	5	95	95	164	161	5	30	212	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	169	5	32	223	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	1	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	169	3	32	227	0
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot		
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases				4					2			
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.5	48.9	48.9	3.3	39.7	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		13.0	49.4	49.4	3.8	40.2	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.16	0.62	0.62	0.05	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		288	2185	978	84	1773	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm				0.01				0.00				
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.60	0.08	0.00	0.38	0.13	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		31.1	6.1	5.9	37.0	10.6	
Progression Factor	1.00	1.00	1.00	0.83	1.31		1.05	0.66	0.58	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	0.7	0.2		0.3	0.0	0.0	2.9	0.1	
Delay (s)	39.7	32.4	32.1	32.3	42.9		32.9	4.1	3.4	39.8	10.7	
Level of Service	D	C	C	C	D		C	A	A	D	B	
Approach Delay (s)		32.3			42.7			18.5			14.3	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay			24.9									C
HCM Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)		16.0				
Intersection Capacity Utilization			30.8%			ICU Level of Service		A				
Analysis Period (min)			15									
c Critical Lane Group												































9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3046	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3046	
Volume (vph)	0	941	746	89	1082	0	0	0	0	328	324	677
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	991	785	94	1139	0	0	0	0	345	341	713
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	53	0
Lane Group Flow (vph)	0	991	642	94	1139	0	0	0	0	345	1001	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8						6
Permitted Phases		4						6				
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	990	
v/s Ratio Prot		0.28		0.03		c0.32						
v/s Ratio Perm		c0.41						0.21		0.33		
v/c Ratio		0.60	0.87	0.45	0.56					0.66	1.32dr	
Uniform Delay, d1		16.0	19.3	36.2	10.7					23.2	27.0	
Progression Factor		1.13	1.91	1.27	2.01					1.00	1.00	
Incremental Delay, d2		0.2	1.5	0.1	0.1					6.4	31.5	
Delay (s)		18.3	38.4	46.1	21.6					29.6	58.5	
Level of Service		B	D	D	C					C	E	
Approach Delay (s)		27.2		23.4		0.0		51.3				
Approach LOS		C		C		A		D				
Intersection Summary												
HCM Average Control Delay		33.8		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0		E				
Intersection Capacity Utilization		86.4%		ICU Level of Service								
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												












10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		 	 			 	  		 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3408		1681	1704	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3408		1681	1704	2787	1770	1814	
Volume (vph)	0	569	701	413	356	117	816	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	599	738	435	375	123	859	114	599	44	43	9
RTOR Reduction (vph)	0	0	543	0	33	0	0	0	475	0	7	0
Lane Group Flow (vph)	0	599	195	435	465	0	474	499	124	44	45	0
Turn Type	Prot	Perm		Prot		Split		Perm		Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases		4						2				
Actuated Green, G (s)	17.5	17.5	12.5	34.5		16.0	16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0		16.5	16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44		0.21	0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1491		347	351	575	365	374		
v/s Ratio Prot	0.12		c0.13	0.14		0.28	c0.29		c0.02	0.02		
v/s Ratio Perm		c0.12						0.04				
v/c Ratio	0.52	0.55	0.78	0.31		1.37	1.42	0.21	0.12	0.12		
Uniform Delay, d1	27.2	27.4	32.1	14.7		31.8	31.8	26.4	25.8	25.8		
Progression Factor	1.49	7.19	1.18	1.22		1.06	1.06	2.58	0.87	0.84		
Incremental Delay, d2	1.4	4.7	6.3	0.5		173.7	197.9	0.4	0.7	0.7		
Delay (s)	41.8	201.8	44.1	18.4		207.4	231.6	68.5	23.1	22.5		
Level of Service	D	F	D	B		F	F	E	C	C		
Approach Delay (s)	130.1			30.4			162.2			22.7		
Approach LOS	F			C			F			C		
Intersection Summary												
HCM Average Control Delay		116.7		HCM Level of Service				F				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)				16.0				
Intersection Capacity Utilization		68.5%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												






























11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	981	649	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1033	683	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1033	714	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	10.0	50.5	36.0	20.5		20.5
Effective Green, g (s)	10.5	51.0	36.5	21.0		21.0
Actuated g/C Ratio	0.13	0.64	0.46	0.26		0.26
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	451	2256	1603	465		416
v/s Ratio Prot	0.06	c0.29	0.20	c0.05		
v/s Ratio Perm				0.04		
v/c Ratio	0.45	0.46	0.45	0.21		0.16
Uniform Delay, d1	32.1	7.4	14.8	23.0		22.7
Progression Factor	0.91	2.15	1.00	1.00		1.00
Incremental Delay, d2	0.6	0.6	0.9	1.0		0.8
Delay (s)	29.7	16.5	15.7	24.0		23.5
Level of Service	C	B	B	C		C
Approach Delay (s)	18.7		15.7	23.6		
Approach LOS	B		B	C		
Intersection Summary						
HCM Average Control Delay	18.5		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.39					
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	40.3%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900								
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0								
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00								
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85								
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00								
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583								
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00								
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583								
Volume (vph)	981	3	40	8	3	5	514	489	2	7	435	706								
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
Adj. Flow (vph)	1033	3	42	8	3	5	541	515	2	7	458	743								
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	569								
Lane Group Flow (vph)	517	519	11	0	11	0	541	516	0	7	458	174								
Turn Type	Split	Perm		Split	Prot			Prot		Perm										
Protected Phases	4	4		8	8		5	2		1	6									
Permitted Phases			4									6								
Actuated Green, G (s)	20.5	20.5	20.5		1.5		27.1	38.5		1.5	12.9	12.9								
Effective Green, g (s)	21.0	21.0	21.0		2.0		27.6	39.0		2.0	13.4	13.4								
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.17								
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0								
Lane Grp Cap (vph)	441	443	416		44		611	1724		44	593	265								
v/s Ratio Prot	0.31	c0.31			c0.01		c0.31	0.15		0.00	c0.13									
v/s Ratio Perm			0.01									0.11								
v/c Ratio	1.17	1.17	0.03		0.25		0.89	0.30		0.16	0.77	0.65								
Uniform Delay, d1	29.5	29.5	21.9		38.3		24.7	12.3		38.2	31.8	31.1								
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.24	1.12	4.08								
Incremental Delay, d2	99.2	98.9	0.0		3.0		14.4	0.4		1.0	5.8	7.4								
Delay (s)	128.7	128.4	21.9		41.3		39.1	12.7		48.4	41.5	134.3								
Level of Service	F	F	C		D		D	B		D	D	F								
Approach Delay (s)		124.4			41.3			26.2			98.6									
Approach LOS		F			D			C			F									
Intersection Summary																				
HCM Average Control Delay			83.8		HCM Level of Service					F										
HCM Volume to Capacity ratio			0.94																	
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					16.0										
Intersection Capacity Utilization			85.5%		ICU Level of Service					E										
Analysis Period (min)			15																	
c Critical Lane Group																				

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	1087	0	0	860
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	1144	0	0	905
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2049	1144			1144	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2049	1144			1144	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	61	243			611	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	1144	905			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.67	0.53			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		60.5%		ICU Level of Service	B	
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6			0.0
Approach LOS	D					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			37.7%		ICU Level of Service	A
Analysis Period (min)			15			

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	↖	↗	↖	↗	↖	↗
Lane Configurations	↖	↗	↖	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	424	663	251	334	525
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	446	698	264	352	553
RTOR Reduction (vph)	0	292	0	150	0	0
Lane Group Flow (vph)	271	154	698	114	352	553
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	6
Permitted Phases	8		2			
Actuated Green, G (s)	13.4	13.4	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.9	13.9	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	391	349	801	681	281	1215
v/s Ratio Prot	c0.15		c0.37		c0.20	0.30
v/s Ratio Perm		0.10		0.07		
v/c Ratio	0.69	0.44	0.87	0.17	1.25	0.46
Uniform Delay, d1	22.6	21.2	16.4	11.0	26.5	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.9	12.5	0.5	139.6	1.2
Delay (s)	27.8	22.1	28.9	11.5	166.1	6.6
Level of Service	C	C	C	B	F	A
Approach Delay (s)	24.3		24.1		68.7	
Approach LOS	C		C		E	
Intersection Summary						
HCM Average Control Delay		39.8		HCM Level of Service	D	
HCM Volume to Capacity ratio		0.90				
Actuated Cycle Length (s)		63.0		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		77.6%		ICU Level of Service	D	
Analysis Period (min)		15				
c Critical Lane Group						







































17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	722	36	202	713	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	760	38	213	751	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	119	0	63	70	0	59	0
Lane Group Flow (vph)	53	760	9	213	751	43	67	34	15	284	90	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.21		0.06	c0.21		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.91	0.02	0.83	0.81	0.10	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	29.8	23.5	36.5	27.6	22.4	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	0.91	0.54	0.22	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	14.3	0.0	14.8	3.9	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	44.1	23.6	47.9	18.9	5.0	36.8	28.5	27.7	23.4	14.2	
Level of Service	D	D	C	D	B	A	D	C	C	C	B	
Approach Delay (s)		43.7			22.4			30.4			20.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			29.6				HCM Level of Service	C				
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)	16.0				
Intersection Capacity Utilization			58.2%				ICU Level of Service	B				
Analysis Period (min)			15									
c Critical Lane Group												





















18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		  	  			  	  	  	  	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	823	146	371	794	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	866	154	391	836	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	255	0	117	227	0	0	206
Lane Group Flow (vph)	245	866	51	391	836	122	144	318	47	383	278	50
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.17		0.11	c0.24		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.88	0.51	0.10	0.76	0.73	0.24	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.6	18.5	32.6	23.9	19.8	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.83	0.48	0.31	0.75	0.66	0.77	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	0.7	0.2	5.1	3.2	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	45.1	11.1	6.0	29.4	19.1	16.1	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	B	B	D	C	C	D	D	C
Approach Delay (s)	17.0				20.9		32.5				35.9	
Approach LOS	B				C		C				D	
Intersection Summary												
HCM Average Control Delay			24.9		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			70.0%		ICU Level of Service				C			
Analysis Period (min)	15											
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.96		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4901		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4901		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1219	389	68	1162	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1283	409	72	1223	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	67	0	0	0	0	0	12	0	0	0	35
Lane Group Flow (vph)	0	1625	0	72	1223	209	0	13	0	370	370	334
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases						Free	2			6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2199		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.33		0.04	c0.35							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.21
v/c Ratio		0.74		0.62	0.61	0.13		0.03		0.84	0.88	0.63
Uniform Delay, d1		18.2		36.4	11.6	0.0		17.8		24.6	25.1	22.4
Progression Factor		0.39		1.23	0.78	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.8		7.8	1.2	0.1		0.0		13.7	18.9	2.4
Delay (s)		8.9		52.3	10.2	0.1		17.9		38.4	44.0	24.9
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		8.9			10.8			17.9			35.8	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay	16.5			HCM Level of Service				B				
HCM Volume to Capacity ratio	0.80											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				12.0				
Intersection Capacity Utilization	72.1%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱		↑↑↑	↱	↰	↑	↱		↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.83	
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1508	
Volume (vph)	17	1642	273	0	997	350	428	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1728	287	0	1049	368	451	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1728	287	0	1049	368	451	160	160	0	16	0
Turn Type	Prot	Free			Free	Perm		Perm	Perm			
Protected Phases	7	4			8			2			6	
Permitted Phases		Free			Free	2		2		6		
Actuated Green, G (s)	2.2	41.0	80.0		34.3	80.0	30.0	30.0	30.0		30.0	
Effective Green, g (s)	2.7	41.5	80.0		34.8	80.0	30.5	30.5	30.5		30.5	
Actuated g/C Ratio	0.03	0.52	1.00		0.43	1.00	0.38	0.38	0.38		0.38	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3324	1583		2212	1583	530	573	573		575	
v/s Ratio Prot	0.01	c0.27			0.21			0.11				
v/s Ratio Perm			0.18			0.23	c0.32		0.11		0.01	
v/c Ratio	0.30	0.52	0.18		0.47	0.23	0.85	0.28	0.28		0.03	
Uniform Delay, d1	37.7	12.7	0.0		16.1	0.0	22.7	17.1	17.1		15.5	
Progression Factor	1.05	1.07	1.00		0.63	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.7	0.4	0.2		0.5	0.3	12.4	0.3	0.3		0.0	
Delay (s)	41.4	13.9	0.2		10.7	0.3	35.1	17.4	17.4		15.5	
Level of Service	D	B	A		B	A	D	B	B		B	
Approach Delay (s)		12.2			8.0			27.7			15.5	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM Average Control Delay		13.6			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		57.1%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑↑	↱	↰	↑	↱	↰	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1149	545	141	783	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1209	574	148	824	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	38	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1209	179	148	965	0	226	475	47	107	242	29
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.34		0.08	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	1.09	0.36	0.60	0.68		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.1		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.63	0.63	2.22	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	54.9	1.8	4.1	2.6		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	20.0	72.2	49.2	36.5	27.7		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	C	E	D	D	C		D	C	C	C	C	C
Approach Delay (s)		58.7			28.8			32.7			31.1	
Approach LOS		E			C			C			C	
Intersection Summary												
HCM Average Control Delay		43.0			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		71.9%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	220	321	494	108	200	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	232	338	520	114	211	360	231
RTOR Reduction (vph)	0	67	0	0	177	0	0	75	0	0	174	
Lane Group Flow (vph)	140	655	0	135	620	55	338	520	39	211	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		c0.12	0.19	
v/s Ratio Perm					0.03			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.15	0.94	0.81	0.07	1.18	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	21.0	27.3	20.5	15.2	31.1	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.2	33.1	10.4	0.3	123.6	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	21.2	60.4	30.9	15.4	154.8	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	F	D	C
Approach Delay (s)		39.7			32.5			39.4			63.6	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM Average Control Delay		43.0										
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		69.3										
Intersection Capacity Utilization		77.3%										
Analysis Period (min)		15										
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3517		1770	3539	1583	1770	1660	1660	1770	1649	1649
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3517		1770	3539	1583	1770	1660	1660	1770	1649	1649
Volume (vph)	102	729	32	53	855	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	767	34	56	900	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	119	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	798	0	56	900	232	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8							6
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.23		0.03	c0.25		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.15							
v/c Ratio	0.67	0.71		0.58	0.89	0.51	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.9		41.6	30.9	27.0	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.63	0.55	0.19	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.8		7.8	10.9	3.7	22.4	1.0		5.7	0.1	
Delay (s)	50.4	30.7		34.2	27.8	8.8	64.9	40.2		30.6	16.7	
Level of Service	D	C		C	C	A	E	D		C	B	
Approach Delay (s)		33.0			23.0			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		28.3										
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		90.0										
Intersection Capacity Utilization		74.6%										
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↕↕					↖↖	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	465	99	1017	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	489	104	1071	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	123	0	0	0	0	0	0	0	66	0
Lane Group Flow (vph)	0	862	366	104	1071	0	0	0	0	673	157	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06		c0.30				c0.20	0.10	
v/s Ratio Perm		0.23										
v/c Ratio		0.59	0.56	0.44	0.51					0.61	0.31	
Uniform Delay, d1		20.7	20.4	35.8	10.9					25.7	22.9	
Progression Factor		0.51	0.46	1.30	1.77					1.00	1.00	
Incremental Delay, d2		1.3	2.5	1.2	0.8					1.0	1.6	
Delay (s)		11.8	12.0	47.7	20.2					26.7	24.5	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		11.9			22.6			0.0			26.1	
Approach LOS		B			C			A			C	
Intersection Summary												
HCM Average Control Delay		19.3		HCM Level of Service				B				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)				8.0				
Intersection Capacity Utilization		62.5%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	468	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	493	248
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	1538	0	0	649	493	228
Turn Type				Perm		
Protected Phases	4		8		2	
Permitted Phases				2		
Actuated Green, G (s)	62.0		62.0		19.0	
Effective Green, g (s)	62.5		62.5		19.5	
Actuated g/C Ratio	0.69		0.69		0.22	
Clearance Time (s)	4.5		4.5		4.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	2458		2458		744	
v/s Ratio Prot	c0.43		0.18		0.14	
v/s Ratio Perm				c0.14		
v/c Ratio	0.63		0.26		0.66	
Uniform Delay, d1	7.4		5.1		32.2	
Progression Factor	0.36		1.00		1.00	
Incremental Delay, d2	1.0		0.3		2.2	
Delay (s)	3.6		5.4		34.5	
Level of Service	A		A		C	
Approach Delay (s)	3.6		5.4		35.3	
Approach LOS	A		A		D	
Intersection Summary						
HCM Average Control Delay			12.1		HCM Level of Service	
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	
Intersection Capacity Utilization			62.5%		ICU Level of Service	
Analysis Period (min)			15			
c Critical Lane Group						

26: Redwood Drive & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	6	11	2	7	226	19	790	20	116	667	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	6	12	2	7	238	20	832	21	122	702	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1527	1841	353	1482	1822	416	706			853		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1527	1841	353	1482	1822	416	706			853		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	90	98	97	88	59	98			84		
cM capacity (veh/h)	38	61	643	68	63	586	888			782		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	247	20	416	416	21	122	468	238			
Volume Left	7	2	20	0	0	0	122	0	0			
Volume Right	12	238	0	0	0	21	0	0	4			
cSH	80	609	888	1700	1700	1700	782	1700	1700			
Volume to Capacity	0.32	0.41	0.02	0.24	0.24	0.01	0.16	0.28	0.14			
Queue Length 95th (ft)	30	49	2	0	0	0	14	0	0			
Control Delay (s)	69.6	17.4	9.1	0.0	0.0	0.0	10.5	0.0	0.0			
Lane LOS	F	C	A				B					
Approach Delay (s)	69.6	17.4	0.2				1.5					
Approach LOS	F	C										
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			49.2%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Redwood Drive & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	221	2	11	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	233	2	12	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	235			149			393	393	148	393	394	234
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235			149			393	393	148	393	394	234
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1333			1432			564	541	899	564	541	805
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	239	13	1								
Volume Left	1	4	12	0								
Volume Right	3	2	1	0								
cSH	1333	1432	582	541								
Volume to Capacity	0.00	0.00	0.02	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	11.3	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.3	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			28.4%			ICU Level of Service			A			
Analysis Period (min)			15									

28: Redwood Drive & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	23	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	24	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	34	5								
Volume Left	1	4	24	4								
Volume Right	2	8	0	1								
cSH	1341	1454	580	614								
Volume to Capacity	0.00	0.00	0.06	0.01								
Queue Length 95th (ft)	0	0	5	1								
Control Delay (s)	0.1	0.2	11.6	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.6	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			24.0%		ICU Level of Service			A				
Analysis Period (min)			15									

29: Redwood Drive & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			27.4%		ICU Level of Service	A
Analysis Period (min)			15			

30: Redwood Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		32.1%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Redwood Drive & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	→	↘	←	↙	↖	↑	↗	↘	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1308	191	1098	568	215	163	279	475	256
v/c Ratio	2.38	0.34	1.84	0.86	0.97	0.56	0.72	0.77	1.00
Control Delay	650.2	34.5	410.3	37.2	122.0	77.8	18.3	69.2	114.2
Queue Delay	53.1	5.6	108.1	62.7	0.0	0.0	2.5	340.5	0.0
Total Delay	703.3	40.2	518.4	99.9	122.0	77.8	20.8	409.7	114.2
Queue Length 50th (ft)	~2256	136	~1867	323	228	87	0	247	251
Queue Length 95th (ft)	#2526	m178n#1983	m295	#402	127	95	#350	#448	
Internal Link Dist (ft)	550	220			110			270	
Turn Bay Length (ft)					150		100	275	
Base Capacity (vph)	550	567	597	662	221	376	418	619	257
Starvation Cap Reductn	0	313	69	160	0	0	0	0	0
Spillback Cap Reductn	75	0	0	0	0	0	60	348	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.75	0.75	2.08	1.13	0.97	0.43	0.78	1.75	1.00
Intersection Summary									
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	↘	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	169	5	32	228
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.60	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	28.2	23.3	32.7	4.0	3.4	35.8	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	28.2	23.3	32.7	4.0	3.4	35.8	11.3
Queue Length 50th (ft)	2	15	0	2	27	104	3	0	15	24
Queue Length 95th (ft)	13	39	49	m4	m40	m90	m36	m1	40	66
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	400	2462	1102	184	1931
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12
Intersection Summary										
m	Volume for 95th percentile queue is metered by upstream signal.									

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	991	785	94	1139	345	1054
v/c Ratio	0.59	0.88	0.37	0.56	0.66	1.32dr
Control Delay	18.2	26.0	45.2	21.8	30.4	57.2
Queue Delay	30.2	128.8	0.0	0.3	0.0	108.6
Total Delay	48.4	154.8	45.2	22.1	30.4	165.8
Queue Length 50th (ft)	194	767	21	267	161	~275
Queue Length 95th (ft)	m133	m151	m21	m171	261	#422
Internal Link Dist (ft)	220		466			348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1043
Starvation Cap Reductn	736	282	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	216
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.29	0.37	0.67	0.66	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	599	738	435	498	474	499	599	44	52
v/c Ratio	0.52	0.82	0.78	0.33	1.37	1.42	0.57	0.12	0.14
Control Delay	42.0	26.2	48.2	16.4	203.9	227.3	8.1	23.3	19.1
Queue Delay	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	32.9	48.2	16.4	203.9	227.3	8.1	23.3	19.1
Queue Length 50th (ft)	142	212	120	110	~317	~342	37	22	23
Queue Length 95th (ft)	162	312	#180	147	m#330	m#352	m27	43	44
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	899	558	1524	347	351	1050	365	381
Starvation Cap Reductn	0	123	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.95	0.78	0.33	1.37	1.42	0.57	0.12	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1033	718	97	248
v/c Ratio	0.45	0.46	0.45	0.21	0.41
Control Delay	31.6	16.6	16.2	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	31.6	17.2	16.2	24.5	5.8
Queue Length 50th (ft)	62	238	122	38	0
Queue Length 95th (ft)	84	260	178	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1607	465	598
Starvation Cap Reductn	0	741	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.68	0.45	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	517	519	42	16	541	517	7	458	743
v/c Ratio	1.17	1.17	0.09	0.11	1.02	0.25	0.05	0.50	0.81
Control Delay	129.2	128.8	8.3	29.3	74.3	10.7	41.7	31.3	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
Total Delay	129.2	128.8	8.3	29.3	74.3	10.7	41.7	31.3	17.7
Queue Length 50th (ft)	~329	~330	0	5	~278	51	4	127	189
Queue Length 95th (ft)	#523	#524	23	23	#478	147	m4	m#220	#342
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2044	177	912	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	70
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.17	1.17	0.09	0.09	1.02	0.25	0.04	0.50	0.88
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	446	698	264	352	553
v/c Ratio	0.69	0.70	0.87	0.32	1.25	0.46
Control Delay	32.6	11.2	32.0	3.1	167.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	11.2	32.0	3.1	167.8	7.4
Queue Length 50th (ft)	96	22	248	0	~183	99
Queue Length 95th (ft)	168	104	#451	38	#329	160
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	672	800	830	281	1215
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.66	0.87	0.32	1.25	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	760	38	213	751	162	67	97	85	284	149
v/c Ratio	0.40	1.01	0.10	0.83	0.81	0.30	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	68.8	9.9	55.1	24.7	2.2	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	68.8	9.9	55.1	24.7	2.2	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	~204	0	40	153	0	16	8	0	118	13
Queue Length 95th (ft)	61	#323	23	m#90	#301	m3	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	535	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.01	0.10	0.83	0.81	0.30	0.26	0.25	0.22	0.53	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	866	154	391	836	377	144	435	274	383	278	256
v/c Ratio	0.88	0.51	0.25	0.76	0.73	0.49	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	50.8	11.2	1.8	33.4	19.6	3.8	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	11.2	1.8	33.4	19.6	3.8	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	78	58	3	107	208	30	71	74	0	95	129	0
Queue Length 95th (ft) m#107	m60	m4	#159	223	28	#157	118	65	#188	#230	58	
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1144	767	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.51	0.25	0.76	0.73	0.49	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1692	72	1223	209	25	370	370	369
v/c Ratio	0.73	0.51	0.61	0.13	0.05	0.84	0.88	0.65
Control Delay	8.5	55.2	10.8	0.1	9.8	43.2	48.5	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	55.2	10.8	0.1	9.8	43.2	48.5	24.9
Queue Length 50th (ft)	130	29	203	0	2	169	172	127
Queue Length 95th (ft)	166	m70	m121	m0	18	#318	#329	217
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2323	142	2000	1583	568	475	455	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.51	0.61	0.13	0.04	0.78	0.81	0.61

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1728	287	1049	368	451	161	161	18
v/c Ratio	0.14	0.52	0.18	0.44	0.23	0.85	0.28	0.28	0.03
Control Delay	38.2	15.7	0.2	11.9	0.3	37.1	16.2	16.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	15.7	0.2	11.9	0.3	37.1	16.2	16.2	10.1
Queue Length 50th (ft)	10	170	0	77	0	203	56	56	5
Queue Length 95th (ft)	m13	m275	m0	131	m0	247	76	76	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3321	1583	2381	1583	730	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.52	0.18	0.44	0.23	0.62	0.20	0.20	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1209	574	148	1003	226	475	236	107	242	193
v/c Ratio	0.51	1.09	0.64	0.60	0.68	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	22.5	76.4	8.7	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	76.4	9.6	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	70	~403	179	69	154	114	120	0	54	62	0
Queue Length 95th (ft)	69	#487	90	#187	#252	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1107	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	118	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.09	0.74	0.60	0.68	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	232	338	520	114	211	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.42	0.95	0.81	0.18	1.18	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	157.7	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	157.7	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	~112	146	0
Queue Length 95th (ft)	#162	#221	#155	184	50	#296	#358	30	#234	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	560	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.41	0.95	0.81	0.18	1.18	0.79	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	801	56	900	351	51	91	511	132
v/c Ratio	0.67	0.65	0.47	0.84	0.59	0.43	0.44	0.80	0.18
Control Delay	64.2	31.0	37.8	26.5	6.7	52.2	21.8	35.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	31.0	37.8	26.5	6.7	52.2	21.8	35.9	5.8
Queue Length 50th (ft)	61	224	31	274	4	28	14	237	10
Queue Length 95th (ft)	#161	#336	m56	#384	21	65	57	#388	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	159	1234	118	1077	598	118	367	653	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	6	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.65	0.47	0.84	0.59	0.43	0.25	0.78	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	489	104	1071	673	223
v/c Ratio	0.58	0.62	0.39	0.51	0.61	0.39
Control Delay	12.2	8.6	48.3	20.5	28.6	15.2
Queue Delay	0.2	0.5	0.0	0.4	0.0	0.0
Total Delay	12.4	9.1	48.3	20.9	28.6	15.2
Queue Length 50th (ft)	118	69	58	264	164	52
Queue Length 95th (ft)	146	m110	m101	327	222	113
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	785	295	2084	1106	577
Starvation Cap Reductn	142	70	0	487	0	0
Spillback Cap Reductn	11	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.68	0.35	0.67	0.61	0.39
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	493	248
v/c Ratio	0.63	0.26	0.66	0.68
Control Delay	4.1	6.2	36.0	37.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.1	6.2	36.0	37.9
Queue Length 50th (ft)	0	59	135	119
Queue Length 95th (ft)	246	115	162	176
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2456	2456	1221	580
Starvation Cap Reductn	64	0	0	0
Spillback Cap Reductn	0	8	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.40	0.43
Intersection Summary				

**CUMULATIVE 2020 + ALTERNATIVE C
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	16	369	22	209	14	677	329	223	508	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	14	17	388	23	220	15	713	346	235	535	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1869	2094	536	1943	1923	886	538			1059		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1869	2094	536	1943	1923	886	538			1059		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	59	97	0	45	36	99			64		
cM capacity (veh/h)	8	33	544	24	42	344	1030			658		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	632	15	1059	235	538						
Volume Left	0	388	15	0	235	0						
Volume Right	17	220	0	346	0	3						
cSH	69	36	1030	1700	658	1700						
Volume to Capacity	0.44	17.64	0.01	0.62	0.36	0.32						
Queue Length 95th (ft)	44	Err	1	0	40	0						
Control Delay (s)	93.9	Err	8.5	0.0	13.5	0.0						
Lane LOS	F	F	A		B							
Approach Delay (s)	93.9	Err	0.1		4.1							
Approach LOS	F	F										
Intersection Summary												
Average Delay		2520.0										
Intersection Capacity Utilization		106.3%		ICU Level of Service		G						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	546	10	9	581	9	10	21	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	575	11	9	612	9	11	22	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	621			585			1252	1241	580	1258	1242	616
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621			585			1252	1241	580	1258	1242	616
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	87	98	92	94	98
cM capacity (veh/h)	960			989			137	171	514	128	171	490
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	596	631	43	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	960	989	191	191								
Volume to Capacity	0.01	0.01	0.23	0.16								
Queue Length 95th (ft)	1	1	21	14								
Control Delay (s)	0.3	0.3	29.3	27.5								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.3	0.3	29.3	27.5								
Approach LOS			D	D								
Intersection Summary												
Average Delay		1.9										
Intersection Capacity Utilization		45.9%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	170	386	845	280	9	311	32	752	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	406	889	295	9	327	34	792	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			585			2497	2486	382	3290	2685	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			585			2497	2486	382	3290	2685	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			10			0	0	0	0	0	99
cM capacity (veh/h)	1257			989			0	3	665	0	2	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	596	1194	1153	32								
Volume Left	11	889	327	11								
Volume Right	406	9	792	11								
cSH	1257	989	0	0								
Volume to Capacity	0.01	0.90	Err	Err								
Queue Length 95th (ft)	1	326	Err	Err								
Control Delay (s)	0.2	31.2	Err	Err								
Lane LOS	A	D	F	F								
Approach Delay (s)	0.2	31.2	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization		177.1%		ICU Level of Service			H					
Analysis Period (min)		15										



















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	912	10	9	1116	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	960	11	9	1175	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1184			971			2196	2189	965	2196	2185	1175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1184			971			2196	2189	965	2196	2185	1175
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			57	76	97	58	76	95
cM capacity (veh/h)	590			710			25	44	309	25	44	233
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	981	9	1175	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	590	710	1700	1700	45	45						
Volume to Capacity	0.02	0.01	0.69	0.01	0.70	0.71						
Queue Length 95th (ft)	1	1	0	0	67	68						
Control Delay (s)	0.6	10.1	0.0	0.0	189.7	192.1						
Lane LOS	A	B			F	F						
Approach Delay (s)	0.6	0.1			189.7	192.1						
Approach LOS					F	F						
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization		68.7%		ICU Level of Service		C						
Analysis Period (min)		15										























5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	40	851	41	188	1081	189	44	14	396	180	31	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	896	43	198	1138	199	46	15	417	189	33	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1337			939			1994	2734	469	2589	2656	668
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1337			939			1994	2734	469	2589	2656	668
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			73			0	0	23	0	0	97
cM capacity (veh/h)	512			726			0	13	540	0	15	400
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	42	597	342	198	759	578	478	234				
Volume Left	42	0	0	198	0	0	46	189				
Volume Right	0	0	43	0	0	199	417	12				
cSH	512	1700	1700	726	1700	1700	0	0				
Volume to Capacity	0.08	0.35	0.20	0.27	0.45	0.34	Err	Err				
Queue Length 95th (ft)	7	0	0	28	0	0	Err	Err				
Control Delay (s)	12.7	0.0	0.0	11.8	0.0	0.0	Err	Err				
Lane LOS	B			B			F	F				
Approach Delay (s)	0.5			1.5			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization	92.5%			ICU Level of Service			F					
Analysis Period (min)	15											

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Sign Control	Free			Free				Stop			Stop	
Grade	0%				0%				0%			
Volume (veh/h)	53	1101	273	509	1196	273	143	105	559	217	41	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	1159	287	536	1259	287	151	111	588	228	43	125
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None				
Median storage veh												
Upstream signal (ft)	630											
pX, platoon unblocked												
vC, conflicting volume	1546			1446			3262	4032	723	3809	4032	773
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1546			1446			3262	4032	723	3809	4032	773
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			0			0	0	0	0	0	63
cM capacity (veh/h)	425			464			0	0	369	0	0	342
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	56	773	674	536	839	707	849	397				
Volume Left	56	0	0	536	0	0	151	228				
Volume Right	0	0	287	0	0	287	588	125				
cSH	425	1700	1700	464	1700	1700	0	0				
Volume to Capacity	0.13	0.45	0.40	1.15	0.49	0.42	Err	Err				
Queue Length 95th (ft)	11	0	0	483	0	0	Err	Err				
Control Delay (s)	14.7	0.0	0.0	119.5	0.0	0.0	Err	Err				
Lane LOS	B			F			F	F				
Approach Delay (s)	0.5			30.8			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization	132.7%			ICU Level of Service			H					
Analysis Period (min)	15											

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1648	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1648	
Volume (vph)	157	1465	255	73	1188	730	556	103	350	453	70	234
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	165	1542	268	77	1251	768	585	108	368	477	74	246
RTOR Reduction (vph)	0	0	50	0	0	152	0	0	342	0	75	0
Lane Group Flow (vph)	165	1542	218	77	1251	616	585	108	26	477	245	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot			
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4		8			2				
Actuated Green, G (s)	47.5	47.5	47.5	53.5	53.5	53.5	19.5	10.9	10.9	30.1	21.5	
Effective Green, g (s)	48.0	48.0	48.0	54.0	54.0	54.0	20.0	11.4	11.4	30.6	22.0	
Actuated g/C Ratio	0.30	0.30	0.30	0.34	0.34	0.34	0.12	0.07	0.07	0.19	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	531	1017	432	567	597	534	221	252	113	657	227	
v/s Ratio Prot	0.09	c0.45		0.05	c0.71		c0.33	0.03		0.14	c0.15	
v/s Ratio Perm			0.15			0.39		0.02				
v/c Ratio	0.31	1.52	0.51	0.14	2.10	1.15	2.65	0.43	0.23	0.73	1.08	
Uniform Delay, d1	43.2	56.0	46.2	36.8	53.0	53.0	70.0	71.2	70.2	60.8	69.0	
Progression Factor	1.00	1.00	1.00	0.86	0.84	0.84	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	237.4	0.9	0.3	496.3	81.9	754.0	1.2	1.1	4.0	82.4	
Delay (s)	43.6	293.4	47.1	31.8	541.0	126.1	824.0	72.4	71.2	64.8	151.4	
Level of Service	D	F	D	C	F	F	F	E	E	E	F	
Approach Delay (s)		239.1			370.3			486.4			99.5	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		311.0									F	
HCM Volume to Capacity ratio		1.82										
Actuated Cycle Length (s)		160.0							16.0			
Intersection Capacity Utilization		168.0%									H	
Analysis Period (min)		15										
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95						0.91	0.91
Flt		1.00	0.85	1.00	1.00						1.00	0.89
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3539	1583	3433	3539						1610	3030
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1583	3433	3539						1610	3030
Volume (vph)	0	1461	810	77	1288	0	0	0	0	355	288	700
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1538	853	81	1356	0	0	0	0	374	303	737
RTOR Reduction (vph)	0	0	169	0	0	0	0	0	0	0	31	0
Lane Group Flow (vph)	0	1538	684	81	1356	0	0	0	0	374	1009	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases			4									
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	985	
v/s Ratio Prot		c0.43		0.02	c0.38							
v/s Ratio Perm			0.43							0.23	0.33	
v/c Ratio		0.94	0.93	0.39	0.67					0.72	1.42dr	
Uniform Delay, d1		20.3	20.3	36.1	11.7					23.7	27.0	
Progression Factor		1.39	1.83	1.25	1.97					1.00	1.00	
Incremental Delay, d2		1.4	2.8	0.1	0.2					8.1	35.0	
Delay (s)		29.7	39.9	45.2	23.3					31.9	62.0	
Level of Service		C	D	D	C					C	E	
Approach Delay (s)		33.3			24.5				0.0		54.0	
Approach LOS		C			C				A		D	
Intersection Summary												
HCM Average Control Delay		36.5								D		
HCM Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		80.0								8.0		
Intersection Capacity Utilization		90.7%									E	
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

















10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3520		1681	1688	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3520		1681	1688	2787	1770	1723	
Volume (vph)	0	770	1048	499	455	17	913	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	811	1103	525	479	18	961	19	601	9	9	9
RTOR Reduction (vph)	0	0	594	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	811	509	525	494	0	481	499	124	9	11	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	17.5	17.5	12.5	34.5			16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0			16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44			0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1540			347	348	575	365	355	
v/s Ratio Prot	0.16		c0.15	0.14			0.29	c0.30		0.01	c0.01	
v/s Ratio Perm			c0.32						0.04			
v/c Ratio	0.71	1.43	0.94	0.32			1.39	1.43	0.22	0.02	0.03	
Uniform Delay, d1	28.6	31.0	33.1	14.7			31.8	31.8	26.4	25.3	25.4	
Progression Factor	1.47	4.11	1.22	1.25			1.07	1.07	2.69	1.00	1.00	
Incremental Delay, d2	1.7	200.3	21.6	0.5			179.1	200.2	0.3	0.1	0.2	
Delay (s)	43.7	327.8	62.1	18.8			213.1	234.1	71.2	25.5	25.5	
Level of Service	D	F	E	B			F	F	E	C	C	
Approach Delay (s)	207.4			41.1				165.8			25.5	
Approach LOS	F			D				F			C	
Intersection Summary												
HCM Average Control Delay	154.4			HCM Level of Service					F			
HCM Volume to Capacity ratio	0.97											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	92.5%			ICU Level of Service					F			
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	 	 	 		 	 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1216	867	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1280	913	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	80
Lane Group Flow (vph)	144	1280	975	0	107	28
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	8.7	50.5	37.3	20.5		
Effective Green, g (s)	9.2	51.0	37.8	21.0		
Actuated g/C Ratio	0.11	0.64	0.47	0.26		
Clearance Time (s)	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	395	2256	1655	465		
v/s Ratio Prot	0.04	c0.36	0.28	c0.06		
v/s Ratio Perm				0.02		
v/c Ratio	0.36	0.57	0.59	0.23		
Uniform Delay, d1	32.7	8.2	15.4	23.2		
Progression Factor	0.80	2.28	1.00	1.00		
Incremental Delay, d2	0.4	0.8	1.5	1.2		
Delay (s)	26.5	19.6	17.0	24.3		
Level of Service	C	B	B	C		
Approach Delay (s)	20.3		17.0	23.4		
Approach LOS	C		B	C		
Intersection Summary						
HCM Average Control Delay	19.3			HCM Level of Service		B
HCM Volume to Capacity ratio	0.47					
Actuated Cycle Length (s)	80.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	45.9%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	1067	3	47	8	3	5	552	413	2	7	616	926
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1123	3	49	8	3	5	581	435	2	7	648	975
RTOR Reduction (vph)	0	0	36	0	5	0	0	1	0	0	0	564
Lane Group Flow (vph)	562	564	13	0	11	0	581	436	0	7	648	411
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.5	20.5	20.5		1.5		27.1	38.5		1.5	12.9	12.9
Effective Green, g (s)	21.0	21.0	21.0		2.0		27.6	39.0		2.0	13.4	13.4
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	441	443	416		44		611	1724		44	593	265
v/s Ratio Prot	0.33	c0.33			c0.01		c0.33	0.12		0.00	0.18	
v/s Ratio Perm			0.01									c0.26
v/c Ratio	1.27	1.27	0.03		0.25		0.95	0.25		0.16	1.09	1.55
Uniform Delay, d1	29.5	29.5	21.9		38.3		25.5	12.0		38.2	33.3	33.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.19	1.15	1.99
Incremental Delay, d2	140.2	139.6	0.0		3.0		24.8	0.4		0.2	44.7	250.3
Delay (s)	169.7	169.1	22.0		41.3		50.3	12.3		45.7	83.1	316.7
Level of Service	F	F	C		D		D	B		D	F	F
Approach Delay (s)		163.2			41.3			34.0			222.7	
Approach LOS		F			D			C			F	
Intersection Summary												
HCM Average Control Delay		153.7								F		
HCM Volume to Capacity ratio		1.16										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		101.3%								G		
Analysis Period (min)		15										
c Critical Lane Group												












13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	1020	0	0	890
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	1074	0	0	937
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2011	1074			1074	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2011	1074			1074	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	65	267			649	
Direction, Lane #						
Volume Total	0	1074	937			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.63	0.55			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			57.0%		ICU Level of Service	B
Analysis Period (min)			15			

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	144	31	12	359	363	25	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	152	33	13	378	382	26	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	609	204	408				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	609	204	408				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	64	96	99				
cM capacity (veh/h)	422	803	1147				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	152	33	13	189	189	255	154
Volume Left	152	0	13	0	0	0	0
Volume Right	0	33	0	0	0	0	26
cSH	422	803	1147	1700	1700	1700	1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15	0.09
Queue Length 95th (ft)	40	3	1	0	0	0	0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	16.7		0.3			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			3.2				
Intersection Capacity Utilization			25.5%		ICU Level of Service		A
Analysis Period (min)			15				













16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	355	664	253	327	564
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	374	699	266	344	594
RTOR Reduction (vph)	0	292	0	151	0	0
Lane Group Flow (vph)	266	82	699	115	344	594
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.8	13.8	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	803	682	281	1217
v/s Ratio Prot	c0.15		c0.38		c0.19	
v/s Ratio Perm	0.05		0.07			
v/c Ratio	0.69	0.24	0.87	0.17	1.22	0.49
Uniform Delay, d1	22.6	20.2	16.3	11.0	26.4	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	0.4	12.4	0.5	128.4	1.4
Delay (s)	27.5	20.6	28.7	11.5	154.8	6.9
Level of Service	C	C	C	B	F	A
Approach Delay (s)	23.5		24.0			61.2
Approach LOS	C		C			E
Intersection Summary						
HCM Average Control Delay		37.6		HCM Level of Service		D
HCM Volume to Capacity ratio		0.89				
Actuated Cycle Length (s)		62.9		Sum of lost time (s)		12.0
Intersection Capacity Utilization		77.1%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						













17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	707	53	116	630	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	744	56	122	663	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	43	0	0	75	0	58	71	0	56	0
Lane Group Flow (vph)	87	744	13	122	663	22	73	41	18	296	88	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	17.6	17.6	4.4	17.6	17.6	4.4	15.6	15.6	24.4	35.6	
Effective Green, g (s)	4.9	18.1	18.1	4.9	18.1	18.1	4.9	16.1	16.1	24.9	36.1	
Actuated g/C Ratio	0.06	0.23	0.23	0.06	0.23	0.23	0.06	0.20	0.20	0.31	0.45	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	801	358	210	801	358	210	317	303	551	751	
v/s Ratio Prot	0.05	c0.21		0.04	c0.19		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.81	0.93	0.04	0.58	0.83	0.06	0.35	0.13	0.06	0.54	0.12	
Uniform Delay, d1	37.1	30.3	24.1	36.6	29.5	24.3	36.0	26.2	25.8	22.8	12.7	
Progression Factor	1.00	1.00	1.00	0.90	0.53	0.23	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	33.9	16.8	0.0	3.0	5.3	0.1	1.0	0.9	0.4	1.0	0.3	
Delay (s)	70.9	47.1	24.2	35.9	20.9	5.6	37.0	27.1	26.2	23.8	13.0	
Level of Service	E	D	C	D	C	A	D	C	C	C	B	
Approach Delay (s)		48.0			21.3			29.6			20.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay		31.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		56.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3220	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3220	1441	3433	1863	1583
Volume (vph)	216	822	163	377	741	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	865	172	397	780	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	72	261	0	0	198
Lane Group Flow (vph)	227	865	57	397	780	108	182	443	104	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.17		0.12	c0.22		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.52	0.11	0.77	0.69	0.21	0.87	0.71	0.37	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.7	18.7	32.7	23.6	19.8	34.6	30.2	28.0	34.0	30.7	26.3
Progression Factor	0.80	0.52	0.36	0.85	0.79	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.9	0.8	0.3	5.7	2.7	0.8	29.1	3.8	0.8	11.1	15.4	0.2
Delay (s)	38.0	12.2	7.0	33.4	21.4	18.2	63.7	34.0	28.9	45.1	46.1	26.5
Level of Service	D	B	A	C	C	B	E	C	C	D	D	C
Approach Delay (s)		16.1			23.8			37.3			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		28.0			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		71.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2020 + Alternative C

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑↑↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt	0.96	1.00	1.00	0.85	1.00	0.85	0.90	1.00	1.00	0.85	0.85	0.85
Flt Protected	1.00	0.95	1.00	1.00	1.00	0.99	0.99	0.95	0.95	1.00	1.00	1.00
Satd. Flow (prot)	4899	1770	1770	3539	1583	1583	1653	1681	1686	1583	1583	1583
Flt Permitted	1.00	0.95	1.00	1.00	1.00	0.92	0.92	0.74	0.71	1.00	1.00	1.00
Satd. Flow (perm)	4899	1770	1770	3539	1583	1583	1548	1312	1255	1583	1583	1583
Volume (vph)	0	1263	408	68	1000	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1329	429	72	1053	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	66	0	0	0	0	0	12	0	0	0	55
Lane Group Flow (vph)	0	1692	0	72	1053	268	0	12	0	322	322	394
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases	4			3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)	37.0			5.0	46.5	80.0		24.5		24.5	24.5	24.5
Effective Green, g (s)	37.5			5.5	47.0	80.0		25.0		25.0	25.0	25.0
Actuated g/C Ratio	0.47			0.07	0.59	1.00		0.31		0.31	0.31	0.31
Clearance Time (s)	4.5			4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2296			122	2079	1583		484		410	392	495
v/s Ratio Prot	c0.35			0.04	c0.30							
v/s Ratio Perm						0.17		0.01		0.25	c0.26	0.25
v/c Ratio	0.74			0.59	0.51	0.17		0.02		0.79	0.82	0.80
Uniform Delay, d1	17.2			36.2	9.7	0.0		19.0		25.1	25.4	25.2
Progression Factor	0.43			1.21	0.77	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7			6.3	0.7	0.2		0.0		9.5	13.0	8.6
Delay (s)	9.0			50.0	8.2	0.2		19.1		34.6	38.4	33.8
Level of Service	A			D	A	A		B		C	D	C
Approach Delay (s)	9.0				8.8			19.1			35.4	
Approach LOS	A				A			B			D	
Intersection Summary												
HCM Average Control Delay		15.7				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		70.9%				ICU Level of Service		C				
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2020 + Alternative C

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	0.85	0.85	0.85	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	6408	1583	5085	1583	1770	1504	1504	1504	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	1.00	0.82	0.82	0.82
Satd. Flow (perm)	1770	6408	1583	5085	1583	1389	1504	1504	1504	1502	1502	1502
Volume (vph)	21	1567	298	0	853	383	464	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1649	314	0	898	403	488	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	22	1649	314	0	898	403	488	180	181	0	16	0
Turn Type				Prot		Free		Free	Perm		Perm	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases					Free		2		2		6	
Actuated Green, G (s)	2.2	39.0	80.0		32.3	80.0	32.0	32.0	32.0		32.0	
Effective Green, g (s)	2.7	39.5	80.0		32.8	80.0	32.5	32.5	32.5		32.5	
Actuated g/C Ratio	0.03	0.49	1.00		0.41	1.00	0.41	0.41	0.41		0.41	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3164	1583		2085	1583	564	611	611		610	
v/s Ratio Prot	0.01	c0.26			0.18			0.12				
v/s Ratio Perm			0.20			0.25	c0.35		0.12		0.01	
v/c Ratio	0.37	0.52	0.20		0.43	0.25	0.87	0.29	0.30		0.03	
Uniform Delay, d1	37.8	13.8	0.0		16.9	0.0	21.7	16.0	16.0		14.3	
Progression Factor	1.09	1.17	1.00		0.71	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.4	0.4	0.2		0.5	0.3	13.1	0.3	0.3		0.0	
Delay (s)	43.6	16.6	0.2		12.4	0.3	34.8	16.3	16.3		14.3	
Level of Service	D	B	A		B	A	C	B	B		B	
Approach Delay (s)		14.3			8.7		26.9				14.3	
Approach LOS		B			A		C				B	
Intersection Summary												
HCM Average Control Delay		15.1				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		8.0				
Intersection Capacity Utilization		58.3%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4913	1610	3330	1583	1610	3387	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4913	1610	3330	1583	1610	3387	1583	1583
Volume (vph)	235	1232	462	165	694	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1297	486	174	731	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	346	0	62	0	0	204	0	0	131	0
Lane Group Flow (vph)	247	1297	140	174	882	0	229	483	50	181	380	29
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Perm
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	12.6	22.6	22.6	10.0	20.0	15.4	15.4	15.4	14.0	14.0	14.0	14.0
Effective Green, g (s)	13.1	23.1	23.1	10.5	20.5	15.9	15.9	15.9	14.5	14.5	14.5	14.5
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.26	0.20	0.20	0.20	0.18	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	562	1022	457	232	1259	320	662	315	292	614	287	287
v/s Ratio Prot	0.07	c0.37	0.10	c0.18	0.14	c0.15	c0.11	0.11	0.11	0.11	0.11	0.11
v/s Ratio Perm	0.44	1.27	0.31	0.75	0.70	0.72	0.73	0.16	0.62	0.62	0.02	0.02
v/c Ratio	0.44	1.27	0.31	0.75	0.70	0.72	0.73	0.16	0.62	0.62	0.02	0.10
Uniform Delay, d1	30.1	28.4	22.2	33.5	27.0	29.9	30.0	26.5	30.2	30.2	27.3	27.3
Progression Factor	0.59	0.62	1.27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	128.1	1.6	12.8	3.3	7.4	4.0	0.2	3.9	1.9	0.2	0.2
Delay (s)	18.3	145.8	29.8	46.2	30.2	37.4	34.1	26.8	34.1	32.1	27.5	27.5
Level of Service	B	F	C	D	C	D	C	C	C	C	C	C
Approach Delay (s)	102.5	102.5	32.7	32.7	32.7	32.7	32.7	31.6	31.6	31.6	31.6	31.6
Approach LOS	F	F	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9
HCM Volume to Capacity ratio	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Actuated Cycle Length (s)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Intersection Capacity Utilization	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%	79.4%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Volume (vph)	149	583	228	140	661	230	323	483	113	211	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	242	340	508	119	222	377	247
RTOR Reduction (vph)	0	59	0	0	0	183	0	0	78	0	0	181
Lane Group Flow (vph)	157	795	0	147	696	59	340	508	41	222	377	66
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	5.5	16.5	5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5	16.5
Effective Green, g (s)	6.0	17.0	6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24	0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	823	152	859	384	354	639	543	177	452	384	384
v/s Ratio Prot	c0.09	c0.23	0.08	0.20	c0.19	c0.27	c0.13	0.20	0.20	0.20	0.20	0.20
v/s Ratio Perm	1.03	0.97	0.97	0.81	0.15	0.96	0.79	0.08	1.25	0.83	0.04	0.04
v/c Ratio	1.03	0.97	0.97	0.81	0.15	0.96	0.79	0.08	1.25	0.83	0.04	0.17
Uniform Delay, d1	32.0	26.2	31.9	25.0	20.8	27.7	20.8	15.5	31.5	25.2	20.9	20.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.0	23.1	62.4	5.8	0.2	37.3	9.9	0.3	152.1	16.4	1.0	1.0
Delay (s)	114.0	49.3	94.3	30.8	21.0	65.0	30.6	15.8	183.6	41.6	21.9	21.9
Level of Service	F	D	F	C	C	E	C	B	F	D	C	C
Approach Delay (s)	59.4	59.4	37.2	37.2	40.9	40.9	40.9	73.1	73.1	73.1	73.1	73.1
Approach LOS	E	E	D	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM Average Control Delay	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6
HCM Volume to Capacity ratio	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Actuated Cycle Length (s)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Intersection Capacity Utilization	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%	81.6%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3519		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3519		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	812	32	53	914	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	855	34	56	962	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	3	0	0	0	145	0	57	0	0	61	0
Lane Group Flow (vph)	128	886	0	56	962	282	51	34	0	623	84	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.5	21.8		4.4	20.7	20.7	3.3	6.4		39.4	42.5	
Effective Green, g (s)	6.0	22.3		4.9	21.2	21.2	3.8	6.9		39.9	43.0	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	872		96	834	373	75	128		785	783	
v/s Ratio Prot	0.07	c0.25		0.03	c0.27		c0.03	0.02		c0.35	c0.05	
v/s Ratio Perm						0.18						
v/c Ratio	1.08	1.02		0.58	1.15	0.76	0.68	0.26		0.79	0.11	
Uniform Delay, d1	42.0	33.9		41.6	34.4	32.0	42.5	39.2		21.5	12.9	
Progression Factor	1.00	1.00		0.67	0.59	0.27	1.00	1.00		1.00	1.00	
Incremental Delay, d2	107.4	34.5		7.4	80.8	11.4	22.4	1.1		5.5	0.1	
Delay (s)	149.4	68.4		35.4	100.9	20.1	64.9	40.3		27.1	13.0	
Level of Service	F	E		D	F	C	E	D		C	B	
Approach Delay (s)		78.6			74.5			49.1			24.4	
Approach LOS		E			E			D			C	
Intersection Summary												
HCM Average Control Delay		63.3										
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		90.0						20.0				
Intersection Capacity Utilization		81.9%										
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	953	516	66	1115	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	543	69	1174	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	0	0	52	0
Lane Group Flow (vph)	0	1003	426	69	1174	0	0	0	0	674	220	0
Turn Type				Perm	Prot					Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.33					c0.20	0.14	
v/s Ratio Perm			0.27									
v/c Ratio		0.69	0.66	0.29	0.56					0.61	0.43	
Uniform Delay, d1		21.9	21.4	35.1	11.4					25.7	24.0	
Progression Factor		0.44	0.42	1.26	1.68					1.00	1.00	
Incremental Delay, d2		1.4	2.6	0.6	1.0					1.0	2.6	
Delay (s)		11.1	11.7	44.9	20.1					26.7	26.7	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		11.3			21.5				0.0		26.7	
Approach LOS		B			C				A		C	
Intersection Summary												
HCM Average Control Delay		18.6								B		
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		90.0								8.0		
Intersection Capacity Utilization		67.7%								C		
Analysis Period (min)		15										
c Critical Lane Group												













25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	492	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	518	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	518	273
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	60.0			60.0	21.0	21.0
Effective Green, g (s)	60.5			60.5	21.5	21.5
Actuated g/C Ratio	0.67			0.67	0.24	0.24
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2379			2379	820	378
v/s Ratio Prot	c0.47			0.20	0.15	
v/s Ratio Perm						c0.17
v/c Ratio	0.71			0.30	0.63	0.72
Uniform Delay, d1	9.2			6.1	30.7	31.5
Progression Factor	0.37			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.3	1.6	6.7
Delay (s)	4.8			6.4	32.3	38.2
Level of Service	A			A	C	D
Approach Delay (s)	4.8			6.4	34.4	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay	12.6			HCM Level of Service		B
HCM Volume to Capacity ratio	0.71					
Actuated Cycle Length (s)	90.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	67.7%			ICU Level of Service		C
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↖	↖	↖	↖	↖
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	5	8	23	25	251	7	803	26	132	706	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	5	8	24	26	264	7	845	27	139	743	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1607	1912	375	1521	1888	423	751			873		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1607	1912	375	1521	1888	423	751			873		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	45	90	99	62	53	54	99			82		
cM capacity (veh/h)	21	55	622	64	57	580	855			769		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	315	7	423	423	27	139	495	255			
Volume Left	12	24	7	0	0	0	139	0	0			
Volume Right	8	264	0	0	0	27	0	0	7			
cSH	38	374	855	1700	1700	1700	769	1700	1700			
Volume to Capacity	0.66	0.84	0.01	0.25	0.25	0.02	0.18	0.29	0.15			
Queue Length 95th (ft)	59	195	1	0	0	0	16	0	0			
Control Delay (s)	207.1	43.3	9.2	0.0	0.0	0.0	10.7	0.0	0.0			
Lane LOS	F	E	A				B					
Approach Delay (s)	207.1	43.3	0.1				1.7					
Approach LOS	F	E										
Intersection Summary												
Average Delay	9.7											
Intersection Capacity Utilization	51.1%			ICU Level of Service						A		
Analysis Period (min)	15											

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	287	2	12	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	302	2	13	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			175			493	493	172	494	495	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			175			493	493	172	494	495	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	100	100	100	100
cM capacity (veh/h)	1257			1402			484	474	872	482	473	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	312	15	1								
Volume Left	1	7	13	0								
Volume Right	5	2	2	0								
cSH	1257	1402	516	473								
Volume to Capacity	0.00	0.01	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	12.2	12.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.2	12.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		34.1%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	23	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	24	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	34	5								
Volume Left	1	4	24	4								
Volume Right	2	8	0	1								
cSH	1259	1424	502	532								
Volume to Capacity	0.00	0.00	0.07	0.01								
Queue Length 95th (ft)	0	0	5	1								
Control Delay (s)	0.1	0.1	12.7	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.7	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel










2020 + Alternative C
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			193			493	493	181	521	505	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			193			493	493	181	521	505	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			75	100	97	100	100	100
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	193	275	147	0								
Volume Left	0	38	120	0								
Volume Right	24	0	27	0								
cSH	1330	1381	519	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	29	0								
Control Delay (s)	0.0	1.3	14.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.3	14.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		41.6%			ICU Level of Service				A			
Analysis Period (min)		15										

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	165	1542	268	77	1251	768	585	108	368	477	320
v/c Ratio	0.31	1.52	0.56	0.14	2.10	1.12	2.65	0.43	0.81	0.73	1.06
Control Delay	45.2	275.2	39.0	32.1	521.5	94.8	778.1	75.6	20.8	68.1	114.2
Queue Delay	0.0	333.5	0.0	0.0	117.2	108.1	0.0	0.0	26.3	421.4	0.0
Total Delay	45.2	608.7	39.0	32.1	638.7	202.9	778.1	75.6	47.1	489.4	114.2
Queue Length 50th (ft)	134	~1230	192	49	~2169	~751	~1028	58	0	243	~284
Queue Length 95th (ft)	203	#1374	302	m72m	#2337	m#649	#1271	89	110	#350	#490
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	482	567	597	686	221	376	497	656	302
Starvation Cap Reductn	0	0	0	0	66	124	0	0	0	0	0
Spillback Cap Reductn	0	334	0	0	0	0	0	0	134	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	2.26	0.56	0.14	2.36	1.37	2.65	0.29	1.01	1.93	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1538	853	81	1356	374	1040
v/c Ratio	0.91	0.93	0.32	0.67	0.72	1.42dr
Control Delay	29.4	25.9	44.5	23.9	32.9	61.8
Queue Delay	158.4	98.4	0.0	0.7	0.0	146.5
Total Delay	187.8	124.2	44.5	24.6	32.9	208.4
Queue Length 50th (ft)	426	839	19	335	179	~286
Queue Length 95th (ft)	m263	m107	m21	m250	#292	#428
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	918	257	2035	523	1016
Starvation Cap Reductn	546	221	0	227	0	0
Spillback Cap Reductn	0	0	0	341	0	256
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.36	1.22	0.32	0.80	0.72	1.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	811	1103	525	497	481	499	601	9	18
v/c Ratio	0.71	1.16	0.94	0.32	1.39	1.43	0.57	0.02	0.05
Control Delay	43.9	102.5	64.9	18.9	209.2	229.6	8.0	25.7	18.8
Queue Delay	0.0	84.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	43.9	186.7	64.9	18.9	209.2	229.6	8.3	25.7	18.8
Queue Length 50th (ft)	0	~1080	148	127	~321	~341	40	4	4
Queue Length 95th (ft)	m0	m#1434	#240	175	m#293	m#311	m27	16	21
Internal Link Dist (ft)	466		345		380				270
Turn Bay Length (ft)			150		150		200		
Base Capacity (vph)	1144	951	558	1544	347	348	1052	365	363
Starvation Cap Reductn	0	134	0	0	0	0	0	0	0
Spillback Cap Reductn	0	21	0	0	0	0	124	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.35	0.94	0.32	1.39	1.43	0.65	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1280	980	107	108
v/c Ratio	0.37	0.57	0.59	0.23	0.22
Control Delay	27.8	19.8	17.4	24.8	6.3
Queue Delay	0.0	1.8	0.0	0.0	0.0
Total Delay	27.8	21.5	17.4	24.8	6.3
Queue Length 50th (ft)	40	286	177	42	0
Queue Length 95th (ft)	m56	318	251	83	36
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1663	465	495
Starvation Cap Reductn	0	762	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.86	0.59	0.23	0.22
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	562	564	49	16	581	437	7	648	975
v/c Ratio	1.27	1.27	0.11	0.11	1.09	0.21	0.05	0.71	1.07
Control Delay	169.0	168.4	7.9	29.3	96.8	10.5	39.9	33.6	51.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4
Total Delay	169.0	168.4	7.9	29.3	96.8	10.5	39.9	33.6	82.4
Queue Length 50th (ft)	~380	~381	0	5	~333	42	3	168	~392
Queue Length 95th (ft)	#580	#580	25	23	#524	124	m3	m#267	m#496
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	452	179	531	2044	177	912	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	1.27	0.11	0.09	1.09	0.21	0.04	0.71	1.15
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	374	699	266	344	594
v/c Ratio	0.68	0.58	0.87	0.32	1.22	0.49
Control Delay	32.2	6.8	32.0	3.1	156.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	6.8	32.0	3.1	156.4	7.7
Queue Length 50th (ft)	94	0	249	0	~176	109
Queue Length 95th (ft)	164	59	#453	38	#320	176
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	672	801	832	282	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.56	0.87	0.32	1.22	0.49
Intersection Summary						
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	744	56	122	663	97	73	99	89	296	144
v/c Ratio	0.65	0.93	0.14	0.47	0.83	0.22	0.28	0.24	0.22	0.56	0.17
Control Delay	60.0	51.5	8.8	36.9	25.0	2.3	38.1	12.1	7.9	28.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	51.5	8.8	36.9	25.0	2.3	38.1	12.1	7.9	28.4	5.6
Queue Length 50th (ft)	43	196	0	21	129	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#314	29	m38	m#242	m3	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	134	800	401	257	800	433	257	409	406	531	843
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.93	0.14	0.47	0.83	0.22	0.28	0.24	0.22	0.56	0.17
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.										
m	Volume for 95th percentile queue is metered by upstream signal.										

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	865	172	397	780	335	182	515	365	357	317	248
v/c Ratio	0.81	0.52	0.27	0.77	0.69	0.46	0.87	0.74	0.68	0.81	0.84	0.48
Control Delay	44.4	12.3	2.0	37.4	21.9	4.1	73.5	31.8	12.3	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	12.3	2.0	37.4	21.9	4.1	73.5	31.8	12.3	51.7	51.3	7.3
Queue Length 50th (ft)	73	60	4	109	190	34	92	108	18	92	151	0
Queue Length 95th (ft)	m#98	m66	m6	m#157	m248	m27	#210	163	108	#172	#279	57
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1134	735	210	755	561	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.52	0.27	0.77	0.69	0.46	0.87	0.68	0.65	0.81	0.80	0.47
Intersection Summary												
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m	Volume for 95th percentile queue is metered by upstream signal.											

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1758	72	1053	268	24	322	322	449
v/c Ratio	0.73	0.49	0.51	0.17	0.05	0.78	0.82	0.82
Control Delay	9.0	53.4	9.0	0.2	9.5	38.5	42.5	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	53.4	9.0	0.2	9.5	38.5	42.5	32.9
Queue Length 50th (ft)	143	33	108	0	2	143	146	160
Queue Length 95th (ft)	179	m67	m123	m0	17	238	#267	268
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2414	147	2078	1583	576	476	455	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.49	0.51	0.17	0.04	0.68	0.71	0.72
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1649	314	898	403	488	181	182	18
v/c Ratio	0.17	0.52	0.20	0.40	0.25	0.86	0.30	0.30	0.03
Control Delay	40.0	18.5	0.2	13.2	0.3	36.7	15.4	15.4	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	18.5	0.2	13.2	0.3	36.7	15.4	15.4	9.4
Queue Length 50th (ft)	12	191	0	73	0	212	60	61	4
Queue Length 95th (ft)	m15	264	m0	119	m0	279	85	86	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3162	1583	2255	1583	730	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.52	0.20	0.40	0.25	0.67	0.23	0.23	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1297	486	174	944	229	483	254	181	380	160
v/c Ratio	0.44	1.27	0.61	0.75	0.71	0.71	0.73	0.49	0.62	0.62	0.38
Control Delay	20.3	150.5	6.4	60.0	29.4	43.2	36.9	7.4	39.4	34.4	7.7
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	150.5	6.9	60.0	29.4	43.2	36.9	7.4	39.4	34.4	7.7
Queue Length 50th (ft)	61	~455	45	88	148	116	123	0	91	96	0
Queue Length 95th (ft)	58	#536	19	#222	#219	#214	176	58	158	138	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1020	802	231	1322	342	707	536	342	720	462
Starvation Cap Reductn	0	0	90	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.27	0.68	0.75	0.71	0.67	0.68	0.47	0.53	0.53	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	242	340	508	119	222	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.43	0.96	0.79	0.19	1.25	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	183.8	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	183.8	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	~122	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	51	#298	#346	31	#247	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	568	354	639	621	177	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.43	0.96	0.79	0.19	1.25	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	↖	→	↗	←	↖	↗	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	889	56	962	427	51	91	623	145
v/c Ratio	1.08	0.91	0.47	1.06	0.78	0.43	0.44	0.81	0.17
Control Delay	150.1	46.8	38.9	68.6	15.0	52.2	22.9	34.4	5.2
Queue Delay	0.0	1.2	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	150.1	48.0	38.9	68.6	15.6	52.2	22.9	34.4	5.2
Queue Length 50th (ft)	~82	264	29	~327	8	28	16	310	9
Queue Length 95th (ft)	#194	#396	m54	#430	#261	65	59	#556	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	118	980	118	904	546	118	366	767	844
Starvation Cap Reductn	0	0	0	0	15	0	0	0	0
Spillback Cap Reductn	0	21	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.93	0.47	1.06	0.80	0.43	0.25	0.81	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	→	↗	↖	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	543	69	1174	674	272
v/c Ratio	0.67	0.70	0.27	0.56	0.61	0.48
Control Delay	11.4	9.2	44.1	20.5	28.6	20.6
Queue Delay	0.4	0.8	0.0	0.4	0.0	0.0
Total Delay	11.8	10.0	44.1	20.9	28.6	20.6
Queue Length 50th (ft)	144	93	38	296	164	86
Queue Length 95th (ft)	m166	m122	m72	362	222	161
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	780	295	2084	1106	562
Starvation Cap Reductn	141	70	0	399	0	0
Spillback Cap Reductn	47	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.76	0.23	0.70	0.61	0.48
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	518	287
v/c Ratio	0.71	0.30	0.63	0.73
Control Delay	5.4	7.3	33.4	39.9
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	5.4	7.4	33.4	39.9
Queue Length 50th (ft)	189	75	138	143
Queue Length 95th (ft)	250	142	162	201
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2378	2378	1221	574
Starvation Cap Reductn	60	0	0	0
Spillback Cap Reductn	0	143	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.32	0.42	0.50
Intersection Summary				

**NEAR-TERM 2008 + ALTERNATIVE D
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	8	14	226	13	97	12	817	62	159	514	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	238	14	102	13	860	65	167	541	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1821	1828	543	1813	1797	893	544			925		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1821	1828	543	1813	1797	893	544			925		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	86	97	0	78	70	99			77		
cM capacity (veh/h)	29	59	540	43	61	340	1025			739		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	354	13	925	167	544						
Volume Left	0	238	13	0	167	0						
Volume Right	15	102	0	65	0	3						
cSH	135	59	1025	1700	739	1700						
Volume to Capacity	0.17	6.04	0.01	0.54	0.23	0.32						
Queue Length 95th (ft)	15	Err	1	0	22	0						
Control Delay (s)	37.0	Err	8.6	0.0	11.3	0.0						
Lane LOS	E	F	A		B							
Approach Delay (s)	37.0	Err	0.1		2.7							
Approach LOS	E	F										
Intersection Summary												
Average Delay		1746.7										
Intersection Capacity Utilization		85.4%		ICU Level of Service		E						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	10	131	94	432	201	10	130	25	558	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	99	455	212	11	137	26	587	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	222			237			1351	1340	187	1935	1384	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			237			1351	1340	187	1935	1384	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			66			0	74	31	0	89	99
cM capacity (veh/h)	1347			1330			85	100	855	9	94	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	247	677	751	32								
Volume Left	11	455	137	11								
Volume Right	99	11	587	11								
cSH	1347	1330	292	25								
Volume to Capacity	0.01	0.34	2.57	1.27								
Queue Length 95th (ft)	1	38	1547	97								
Control Delay (s)	0.4	7.3	743.6	507.5								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.4	7.3	743.6	507.5								
Approach LOS			F	F								
Intersection Summary												
Average Delay		339.4										
Intersection Capacity Utilization		106.7%		ICU Level of Service		G						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	679	10	10	622	20	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	715	11	11	655	21	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	676			725			1443	1438	720	1443	1433	665
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	676			725			1443	1438	720	1443	1433	665
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			89	92	98	89	92	98
cM capacity (veh/h)	916			878			99	130	428	99	131	460
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	736	686	32	32								
Volume Left	11	11	11	11								
Volume Right	11	21	11	11								
cSH	916	878	149	151								
Volume to Capacity	0.01	0.01	0.21	0.21								
Queue Length 95th (ft)	1	1	19	19								
Control Delay (s)	0.3	0.3	35.5	35.2								
Lane LOS	A	A	E	E								
Approach Delay (s)	0.3	0.3	35.5	35.2								
Approach LOS			E	E								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization		51.9%		ICU Level of Service		A						
Analysis Period (min)		15										















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	678	10	10	622	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	714	11	11	655	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	665			724			1437	1426	719	1437	1426	660
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	665			724			1437	1426	719	1437	1426	660
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			89	92	98	89	92	98
cM capacity (veh/h)	924			878			100	132	428	100	132	463
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	735	676	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	924	878	151	152								
Volume to Capacity	0.01	0.01	0.21	0.21								
Queue Length 95th (ft)	1	1	19	19								
Control Delay (s)	0.3	0.3	35.1	34.8								
Lane LOS	A	A	E	D								
Approach Delay (s)	0.3	0.3	35.1	34.8								
Approach LOS			E	D								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization		51.8%		ICU Level of Service		A						
Analysis Period (min)		15										

















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 											
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Volume (veh/h)	60	561	77	116	581	99	35	6	266	112	21	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	591	81	122	612	104	37	6	280	118	22	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	716			672			1691	1717	631	1948	1706	664
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	716			672			1691	1717	631	1948	1706	664
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			87			22	91	42	0	70	97
cM capacity (veh/h)	885			919			47	72	481	16	73	461
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	735	838	323	155								
Volume Left	63	122	37	118								
Volume Right	81	104	280	15								
cSH	885	919	222	20								
Volume to Capacity	0.07	0.13	1.45	7.64								
Queue Length 95th (ft)	6	11	475	Err								
Control Delay (s)	1.8	3.3	268.0	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	1.8	3.3	268.0	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay	798.8											
Intersection Capacity Utilization	104.4%			ICU Level of Service					G			
Analysis Period (min)	15											



























6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Volume (veh/h)	52	739	148	187	669	89	80	45	222	88	13	47		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	55	778	156	197	704	94	84	47	234	93	14	49		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type							None			None				
Median storage veh														
Upstream signal (ft)	630													
pX, platoon unblocked	0.67							0.67	0.67	0.67	0.67	0.67		
vC, conflicting volume	798				934				2166	2157	856	2367	2188	751
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	699				934				2740	2726	856	3040	2772	629
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91				73				0	0	35	0	0	85
cM capacity (veh/h)	602				733				0	9	358	0	9	323
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	988	995	365	156										
Volume Left	55	197	84	93										
Volume Right	156	94	234	49										
cSH	602	733	0	0										
Volume to Capacity	0.09	0.27	Err	Err										
Queue Length 95th (ft)	7	27	Err	Err										
Control Delay (s)	2.8	7.1	Err	Err										
Lane LOS	A	A	F	F										
Approach Delay (s)	2.8	7.1	Err	Err										
Approach LOS			F	F										
Intersection Summary														
Average Delay				Err										
Intersection Capacity Utilization	132.4%			ICU Level of Service			H							
Analysis Period (min)	15													
























7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00				
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93				
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				
Satd. Flow (prot)		1814		1681	1770	1583	1770	3539	1583	3433	1736				
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				
Satd. Flow (perm)		1814		1681	1770	1583	1770	3539	1583	3433	1736				
Volume (vph)	101	780	166	181	633	540	204	155	265	451	131	108			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Adj. Flow (vph)	106	821	175	191	666	568	215	163	279	475	138	114			
RTOR Reduction (vph)	0	4	0	0	0	211	0	0	256	0	19	0			
Lane Group Flow (vph)	0	1098	0	191	666	357	215	163	23	475	233	0			
Turn Type	Split			Split		Perm	Prot		Perm	Prot					
Protected Phases	4	4		8	8		5	2		1	6				
Permitted Phases						8			2						
Actuated Green, G (s)		47.5		53.5	53.5	53.5	19.5	12.7	12.7	28.3	21.5				
Effective Green, g (s)		48.0		54.0	54.0	54.0	20.0	13.2	13.2	28.8	22.0				
Actuated g/C Ratio		0.30		0.34	0.34	0.34	0.12	0.08	0.08	0.18	0.14				
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)		544		567	597	534	221	292	131	618	239				
v/s Ratio Prot		c0.61		0.11	c0.38		c0.12	0.05		0.14	c0.13				
v/s Ratio Perm						0.23			0.01						
v/c Ratio		2.02		0.34	1.12	0.67	0.97	0.56	0.18	0.77	0.97				
Uniform Delay, d1		56.0		39.6	53.0	45.3	69.7	70.6	68.3	62.4	68.7				
Progression Factor		1.00		0.88	0.91	1.00	1.00	1.00	1.00	0.96	0.96				
Incremental Delay, d2		464.6		1.3	69.4	5.2	52.5	2.3	0.6	5.7	50.6				
Delay (s)		520.6		36.1	117.9	50.4	122.2	72.9	69.0	65.6	116.5				
Level of Service		F		D	F	D	F	E	E	E	F				
Approach Delay (s)		520.6			80.0			87.4			83.3				
Approach LOS		F			F			F			F				
Intersection Summary															
HCM Average Control Delay	206.0			HCM Level of Service						F					
HCM Volume to Capacity ratio	1.37														
Actuated Cycle Length (s)	160.0			Sum of lost time (s)						16.0					
Intersection Capacity Utilization	128.2%			ICU Level of Service						H					
Analysis Period (min)	15														
c Critical Lane Group															



















8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Volume (vph)	5	30	140	5	95	95	164	157	5	30	208	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	165	5	32	219	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	2	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	165	3	32	222	0
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot		
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases				4						2		
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		13.6	48.9	48.9	3.3	38.6	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		14.1	49.4	49.4	3.8	39.1	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.18	0.62	0.62	0.05	0.49	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		312	2185	978	84	1724	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.55	0.08	0.00	0.38	0.13	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.1	6.1	5.9	37.0	11.2	
Progression Factor	1.00	1.00	1.00	0.82	1.32		0.98	0.73	0.64	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.1	0.4		1.0	0.0	0.0	2.9	0.2	
Delay (s)	39.7	32.4	32.1	32.6	43.5		30.6	4.5	3.8	39.8	11.3	
Level of Service	D	C	C	C	D		C	A	A	D	B	
Approach Delay (s)		32.3			43.2			17.6			14.9	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay	25.0			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.25											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	30.7%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												

































9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3058	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3058	
Volume (vph)	0	878	618	89	739	0	0	0	0	328	324	610
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	924	651	94	778	0	0	0	0	345	341	642
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	125	0
Lane Group Flow (vph)	0	924	508	94	778	0	0	0	0	345	858	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8						6
Permitted Phases		4						6				
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	994	
v/s Ratio Prot		0.26		0.03		c0.22						
v/s Ratio Perm		c0.32						0.21		0.28		
v/c Ratio		0.56	0.69	0.45	0.38					0.66	1.05dr	
Uniform Delay, d1		15.6	16.9	36.2	9.3					23.2	25.3	
Progression Factor		1.15	1.80	1.17	1.50					1.00	1.00	
Incremental Delay, d2		0.1	0.5	1.2	0.4					6.4	9.9	
Delay (s)		18.1	30.9	43.6	14.3					29.6	35.2	
Level of Service		B	C	D	B					C	D	
Approach Delay (s)		23.4		17.5		0.0		33.7				
Approach LOS		C		B		A		C				
Intersection Summary												
HCM Average Control Delay		25.7		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0		D				
Intersection Capacity Utilization		77.0%		ICU Level of Service								
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												












10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		  	  				  		  	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3407		1681	1715	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3407		1681	1715	2787	1770	1814	
Volume (vph)	0	565	641	413	352	117	476	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	595	675	435	371	123	501	114	599	44	43	9
RTOR Reduction (vph)	0	0	523	0	33	0	0	0	475	0	7	0
Lane Group Flow (vph)	0	595	152	435	461	0	300	315	124	44	45	0
Turn Type	Prot	Perm		Prot	Split		Perm		Split			
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases		4					2					
Actuated Green, G (s)	17.5	17.5	12.5	34.5		16.0	16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0		16.5	16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44		0.21	0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1491		347	354	575	365	374		
v/s Ratio Prot	c0.12	c0.13		0.14		0.18	c0.18	c0.02		0.02		
v/s Ratio Perm		0.10						0.04				
v/c Ratio	0.52	0.43	0.78	0.31		0.86	0.89	0.21	0.12	0.12		
Uniform Delay, d1	27.2	26.6	32.1	14.6		30.7	30.9	26.4	25.8	25.8		
Progression Factor	1.48	9.49	1.18	1.22		0.97	0.96	2.00	0.86	0.84		
Incremental Delay, d2	1.4	3.1	6.3	0.5		20.5	23.2	0.7	0.7	0.7		
Delay (s)	41.6	255.1	44.2	18.4		50.2	53.0	53.5	23.0	22.4		
Level of Service	D	F	D	B		D	D	D	C	C		
Approach Delay (s)	155.1	30.4				52.6	22.7					
Approach LOS	F	C				D	C					
Intersection Summary												
HCM Average Control Delay	83.0		HCM Level of Service				F					
HCM Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)				16.0					
Intersection Capacity Utilization	64.8%		ICU Level of Service				C					
Analysis Period (min)	15											
c Critical Lane Group												





















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	977	645	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1028	679	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1028	710	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.9	50.5	36.1		20.5	20.5
Effective Green, g (s)	10.4	51.0	36.6		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	446	2256	1607		465	416
v/s Ratio Prot	0.06	c0.29	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.46	0.46	0.44		0.21	0.16
Uniform Delay, d1	32.2	7.4	14.8		23.0	22.7
Progression Factor	0.93	2.09	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	0.9		1.0	0.8
Delay (s)	30.4	16.1	15.6		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)	18.5		15.6		23.6	
Approach LOS	B		B		C	
Intersection Summary						
HCM Average Control Delay	18.4		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.38					
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	40.2%		ICU Level of Service		A	
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	641	3	40	8	3	5	514	489	2	7	435	646
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	675	3	42	8	3	5	541	515	2	7	458	680
RTOR Reduction (vph)	0	0	32	0	5	0	0	0	0	0	0	552
Lane Group Flow (vph)	338	340	10	0	11	0	541	517	0	7	458	128
Turn Type	Split		Perm		Split		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	18.8	18.8	18.8		1.5		27.1	40.2		1.5	14.6	14.6
Effective Green, g (s)	19.3	19.3	19.3		2.0		27.6	40.7		2.0	15.1	15.1
Actuated g/C Ratio	0.24	0.24	0.24		0.02		0.35	0.51		0.02	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	406	407	382		44		611	1799		44	668	299
v/s Ratio Prot	0.20	c0.20			c0.01		c0.31	0.15		0.00	c0.13	
v/s Ratio Perm			0.01									0.08
v/c Ratio	0.83	0.84	0.03		0.25		0.89	0.29		0.16	0.69	0.43
Uniform Delay, d1	28.8	28.8	23.2		38.3		24.7	11.3		38.2	30.2	28.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.26	1.12	5.36
Incremental Delay, d2	13.6	13.8	0.0		3.0		14.4	0.4		1.1	3.7	2.9
Delay (s)	42.4	42.6	23.2		41.3		39.1	11.7		49.1	37.4	156.3
Level of Service	D	D	C		D		D	B		D	D	F
Approach Delay (s)	41.4				41.3		25.7			108.1		
Approach LOS	D				D		C			F		
Intersection Summary												
HCM Average Control Delay	61.7		HCM Level of Service		E							
HCM Volume to Capacity ratio	0.80											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		16.0							
Intersection Capacity Utilization	81.8%		ICU Level of Service		D							
Analysis Period (min)	15											
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	←	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	59	832	332	0	754
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	62	876	349	0	794
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1844	1051			1225	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1844	1051			1225	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	77			100	
cM capacity (veh/h)	82	276			569	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	62	1225	794			
Volume Left	0	0	0			
Volume Right	62	349	0			
cSH	276	1700	1700			
Volume to Capacity	0.23	0.72	0.47			
Queue Length 95th (ft)	21	0	0			
Control Delay (s)	21.8	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	21.8	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization		74.3%		ICU Level of Service	D	
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	↖	↗	↖	↑	↓	↘
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑↑	↑↑	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6			0.0
Approach LOS	D					
Intersection Summary						
Average Delay				5.8		
Intersection Capacity Utilization			37.7%		ICU Level of Service	A
Analysis Period (min)			15			

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	↖	↗	↖	↗	↖	↗
Lane Configurations	↖	↗	↖	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	537	627	251	255	498
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	565	660	264	268	524
RTOR Reduction (vph)	0	301	0	151	0	0
Lane Group Flow (vph)	271	264	660	113	268	524
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	13.6	13.6	26.6	26.6	9.5	40.6
Effective Green, g (s)	14.1	14.1	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	395	353	799	679	280	1212
v/s Ratio Prot	0.15		c0.35		c0.15	0.28
v/s Ratio Perm		c0.17		0.07		
v/c Ratio	0.69	0.75	0.83	0.17	0.96	0.43
Uniform Delay, d1	22.5	22.9	16.0	11.1	26.4	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	8.4	9.5	0.5	41.7	1.1
Delay (s)	27.4	31.3	25.5	11.6	68.1	6.5
Level of Service	C	C	C	B	E	A
Approach Delay (s)	30.1		21.5		27.4	
Approach LOS	C		C		C	
Intersection Summary						
HCM Average Control Delay		26.1		HCM Level of Service	C	
HCM Volume to Capacity ratio		0.83				
Actuated Cycle Length (s)		63.2		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		72.9%		ICU Level of Service	C	
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	643	36	202	826	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	677	38	213	869	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	117	0	63	70	0	59	0
Lane Group Flow (vph)	53	677	9	213	869	45	67	34	15	284	90	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.19		0.06	c0.25		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.81	0.02	0.83	0.94	0.11	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	28.9	23.5	36.5	28.8	22.4	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	0.96	0.54	0.20	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	6.1	0.0	13.2	11.4	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	35.1	23.6	48.2	27.0	4.5	36.8	28.5	27.7	23.4	14.2	
Level of Service	D	D	C	D	C	A	D	C	C	C	B	
Approach Delay (s)		35.7			27.7			30.4			20.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			29.0		HCM Level of Service	C						
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	12.0						
Intersection Capacity Utilization		58.6%			ICU Level of Service	B						
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰	↰	↰↰	↰↰	↰	↰	↰↰	↰	↰↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	744	146	371	907	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	783	154	391	955	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	239	0	117	227	0	0	206
Lane Group Flow (vph)	245	783	51	391	955	138	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.15		0.11	c0.27		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.09			0.03			0.03
v/c Ratio	0.88	0.46	0.10	0.76	0.83	0.27	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.1	18.5	32.6	25.1	20.0	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.80	0.52	0.40	0.71	0.64	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.7	0.7	0.3	4.8	5.4	1.0	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	46.0	11.6	7.7	28.0	21.4	11.7	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	C	B	D	C	C	D	D	C
Approach Delay (s)		18.2			20.8			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		73.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												
























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰	↰	↰	↰↰	↰	↰	↰↰	↰	↰↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.97		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4928		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4928		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1215	314	68	1275	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1279	331	72	1342	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	54	0	0	0	0	0	12	0	0	0	25
Lane Group Flow (vph)	0	1556	0	72	1342	209	0	13	0	370	370	344
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free	2				6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2211		117	2000	1583		512		439	420	530
v/s Ratio Prot		0.32		0.04	c0.38							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.22
v/c Ratio		0.70		0.62	0.67	0.13		0.03		0.84	0.88	0.65
Uniform Delay, d1		17.8		36.4	12.2	0.0		17.8		24.6	25.1	22.6
Progression Factor		0.42		1.28	0.75	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.6		7.0	1.4	0.1		0.0		13.7	18.9	2.7
Delay (s)		9.0		53.5	10.5	0.1		17.9		38.4	44.0	25.3
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.0			11.1			17.9			35.9	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.6			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		70.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00		
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98		
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96		
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748		
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.84		
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1522		
Volume (vph)	17	1638	273	0	993	350	546	0	306	14	0	3	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	18	1724	287	0	1045	368	575	0	322	15	0	3	
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0	
Lane Group Flow (vph)	18	1724	287	0	1045	368	575	160	160	0	16	0	
Turn Type	Prot	Free			Free	Perm		Perm	Perm		Perm		
Protected Phases	7	4			8			2			6		
Permitted Phases		Free			Free	2		2		6			
Actuated Green, G (s)	2.2	35.3	80.0		28.6	80.0	35.7	35.7	35.7		35.7		
Effective Green, g (s)	2.7	35.8	80.0		29.1	80.0	36.2	36.2	36.2		36.2		
Actuated g/C Ratio	0.03	0.45	1.00		0.36	1.00	0.45	0.45	0.45		0.45		
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0		
Lane Grp Cap (vph)	60	2868	1583		1850	1583	629	681	681		689		
v/s Ratio Prot	0.01	c0.27			0.21			0.11					
v/s Ratio Perm			0.18			0.23	c0.41		0.11		0.01		
v/c Ratio	0.30	0.60	0.18		0.56	0.23	0.91	0.23	0.23		0.02		
Uniform Delay, d1	37.7	16.7	0.0		20.4	0.0	20.4	13.4	13.4		12.1		
Progression Factor	1.06	1.10	1.00		0.65	1.00	1.00	1.00	1.00		1.00		
Incremental Delay, d2	1.8	0.6	0.2		0.9	0.3	17.8	0.2	0.2		0.0		
Delay (s)	41.9	19.0	0.2		14.1	0.3	38.3	13.6	13.6		12.1		
Level of Service	D	B	A		B	A	D	B	B		B		
Approach Delay (s)		16.5			10.5			29.4			12.1		
Approach LOS		B			B			C			B		
Intersection Summary													
HCM Average Control Delay		17.2		HCM Level of Service					B				
HCM Volume to Capacity ratio		0.76											
Actuated Cycle Length (s)		80.0		Sum of lost time (s)					8.0				
Intersection Capacity Utilization		64.4%		ICU Level of Service					C				
Analysis Period (min)		15											
c Critical Lane Group													

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1145	545	141	779	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1205	574	148	820	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	39	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1205	179	148	960	0	226	475	47	107	242	29
Turn Type	Prot			Perm	Prot		Split		Perm	Split		Perm
Protected Phases	7	4			3	8	2	2		6	6	
Permitted Phases				4					2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.34		0.08	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	1.09	0.36	0.60	0.67		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.1		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.53	0.50	1.68	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	53.1	1.7	4.1	2.5		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	16.9	66.7	37.6	36.5	27.6		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	B	E	D	D	C		D	C	C	C	C	C
Approach Delay (s)		51.7			28.8			32.7		31.1		
Approach LOS		D			C			C		C		
Intersection Summary												
HCM Average Control Delay	39.9			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	71.8%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	184	321	494	108	173	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	194	338	520	114	182	360	231
RTOR Reduction (vph)	0	67	0	0	148	0	0	75	0	0	174	
Lane Group Flow (vph)	140	655	0	135	620	46	338	520	39	182	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.10	0.19	
v/s Ratio Perm					0.03			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.12	0.94	0.81	0.07	1.02	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	20.9	27.3	20.5	15.2	31.1	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.1	33.1	10.4	0.3	71.7	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	21.0	60.4	30.9	15.4	102.9	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	F	D	C
Approach Delay (s)		39.7			32.9			39.4			48.0	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM Average Control Delay		39.6			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		69.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak













	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3516		1770	3539	1583	1770	1660	1660	1770	1649	1649
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3516		1770	3539	1583	1770	1660	1660	1770	1649	1649
Volume (vph)	102	702	32	53	819	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	739	34	56	862	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	125	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	770	0	56	862	226	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.22		0.03	c0.24		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.14							
v/c Ratio	0.67	0.68		0.58	0.86	0.50	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.6		41.6	30.5	26.9	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.65	0.56	0.20	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.4		7.9	8.4	3.6	22.4	1.0		5.7	0.1	
Delay (s)	50.4	30.0		34.9	25.6	8.9	64.9	40.2		30.6	16.7	
Level of Service	D	C		C	C	A	E	D		C	B	
Approach Delay (s)		32.5			21.4		49.1				27.8	
Approach LOS		C			C		D				C	
Intersection Summary												
HCM Average Control Delay		27.4			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		73.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps

2008 + Alternative D

Graton Rancheria Casino & Hotel

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↕↕					↖↖	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	438	99	981	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	461	104	1033	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	116	0	0	0	0	0	0	0	73	0
Lane Group Flow (vph)	0	862	345	104	1033	0	0	0	0	673	150	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06		c0.29				c0.20		0.10
v/s Ratio Perm		0.22										
v/c Ratio		0.59	0.53	0.44	0.50					0.61	0.30	
Uniform Delay, d1		20.7	20.0	35.8	10.7					25.7	22.8	
Progression Factor		0.52	0.47	1.29	1.75					1.00	1.00	
Incremental Delay, d2		1.3	2.3	1.2	0.8					1.0	1.5	
Delay (s)		12.1	11.7	47.3	19.6					26.7	24.3	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		11.9		22.1		0.0				26.1		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		19.2		HCM Level of Service		B						
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		61.7%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps

2008 + Alternative D

Graton Rancheria Casino & Hotel

PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↖↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	432	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	455	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	455	227
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	62.8			62.8	18.2	18.2
Effective Green, g (s)	63.3			63.3	18.7	18.7
Actuated g/C Ratio	0.70			0.70	0.21	0.21
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2489			2489	713	329
v/s Ratio Prot	c0.43			0.18	0.13	
v/s Ratio Perm						c0.14
v/c Ratio	0.62			0.26	0.64	0.69
Uniform Delay, d1	7.0			4.8	32.6	33.0
Progression Factor	0.33			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	1.9	6.1
Delay (s)	3.2			5.1	34.4	39.1
Level of Service	A			A	C	D
Approach Delay (s)	3.2			5.1	36.1	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			11.7	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			61.7%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	6	11	2	7	209	19	774	20	116	630	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	6	12	2	7	220	20	815	21	122	663	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)							5					
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1471	1785	334	1445	1766	407	667			836		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1471	1785	334	1445	1766	407	667			836		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	91	98	97	89	63	98			85		
cM capacity (veh/h)	45	67	662	73	69	593	918			794		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	229	20	407	407	21	122	442	225			
Volume Left	7	2	20	0	0	0	122	0	0			
Volume Right	12	220	0	0	0	21	0	0	4			
cSH	91	619	918	1700	1700	1700	794	1700	1700			
Volume to Capacity	0.28	0.37	0.02	0.24	0.24	0.01	0.15	0.26	0.13			
Queue Length 95th (ft)	26	43	2	0	0	0	14	0	0			
Control Delay (s)	59.1	16.7	9.0	0.0	0.0	0.0	10.4	0.0	0.0			
Lane LOS	F	C	A				B					
Approach Delay (s)	59.1	16.7	0.2				1.6					
Approach LOS	F	C										
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			47.7%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	15	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	16	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	17	1								
Volume Left	1	4	16	0								
Volume Right	3	2	1	0								
cSH	1359	1432	598	557								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	11.2	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.2	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			27.5%			ICU Level of Service			A			
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		27.4%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		32.1%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	→	↖	←	↗	↘	↑	↖	↗	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1102	191	666	568	215	163	279	475	252
v/c Ratio	2.01	0.34	1.12	0.76	0.97	0.56	0.72	0.77	0.98
Control Delay	488.5	36.6	113.7	25.9	122.0	77.8	18.3	69.1	109.2
Queue Delay	129.9	5.2	169.0	11.5	0.0	0.0	1.4	179.5	0.0
Total Delay	618.4	41.8	282.7	37.3	122.0	77.8	19.7	248.6	109.2
Queue Length 50th (ft)	~1804	142	~856	216	228	87	0	247	245
Queue Length 95th (ft)	#2074	m180	n#1100	m329	#402	127	95	#351	#437
Internal Link Dist (ft)	550		220			110			270
Turn Bay Length (ft)					150		100	275	
Base Capacity (vph)	549	567	597	746	221	376	418	619	258
Starvation Cap Reductn	0	309	153	158	0	0	0	0	0
Spillback Cap Reductn	69	0	0	0	0	0	42	278	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.30	0.74	1.50	0.97	0.97	0.43	0.74	1.39	0.98
Intersection Summary									
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	↖	→	↗	↖	←	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	165	5	32	224
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.55	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	28.2	24.5	32.2	4.4	3.8	35.8	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	28.2	24.5	32.2	4.4	3.8	35.8	11.7
Queue Length 50th (ft)	2	15	0	2	34	84	4	0	15	26
Queue Length 95th (ft)	13	39	49	m5	m53	m96	m38	m1	40	65
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	400	2462	1102	184	1885
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12
Intersection Summary										
m	Volume for 95th percentile queue is metered by upstream signal.									

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	924	651	94	778	345	983
v/c Ratio	0.55	0.73	0.37	0.38	0.66	1.05dr
Control Delay	18.0	18.7	44.4	14.4	30.4	31.4
Queue Delay	10.9	45.9	0.0	0.1	0.0	15.9
Total Delay	28.9	64.6	44.4	14.5	30.4	47.3
Queue Length 50th (ft)	195	246	22	96	161	209
Queue Length 95th (ft)	m163	m160	m30	m119	261	#332
Internal Link Dist (ft)	220		466		348	
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1119
Starvation Cap Reductn	734	292	0	0	0	0
Spillback Cap Reductn	0	0	0	338	0	149
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.98	1.08	0.37	0.46	0.66	1.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	595	675	435	494	300	315	599	44	52
v/c Ratio	0.52	0.77	0.78	0.32	0.86	0.89	0.57	0.12	0.14
Control Delay	41.8	22.9	48.2	16.4	52.6	55.5	7.3	23.2	19.0
Queue Delay	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	26.0	48.2	16.4	52.6	55.5	7.3	23.2	19.0
Queue Length 50th (ft)	143	188	120	108	114	120	0	22	23
Queue Length 95th (ft)	0	294	#180	145	m#234	m#250	m53	42	44
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	879	558	1524	347	354	1050	365	381
Starvation Cap Reductn	0	118	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.89	0.78	0.32	0.86	0.89	0.57	0.12	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1028	714	97	248
v/c Ratio	0.46	0.46	0.44	0.21	0.41
Control Delay	32.3	16.2	16.1	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	32.3	16.8	16.1	24.5	5.8
Queue Length 50th (ft)	63	232	121	38	0
Queue Length 95th (ft)	87	268	177	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1609	465	598
Starvation Cap Reductn	0	742	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.68	0.44	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	338	340	42	16	541	517	7	458	680
v/c Ratio	0.83	0.84	0.10	0.11	1.02	0.24	0.05	0.46	0.73
Control Delay	47.7	47.8	8.4	29.3	74.3	10.3	42.3	29.9	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Total Delay	47.7	47.8	8.4	29.3	74.3	10.3	42.3	29.9	13.7
Queue Length 50th (ft)	164	165	0	5	~278	51	4	128	152
Queue Length 95th (ft)	#295	#297	23	23	#478	147	m4	#224	174
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2119	177	988	932
Starvation Cap Reductn	0	0	0	0	0	0	0	0	77
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.77	0.09	0.09	1.02	0.24	0.04	0.46	0.80
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	565	660	264	268	524
v/c Ratio	0.69	0.86	0.83	0.32	0.96	0.43
Control Delay	32.1	23.4	28.1	3.1	75.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	23.4	28.1	3.1	75.3	7.2
Queue Length 50th (ft)	96	60	228	0	108	91
Queue Length 95th (ft)	168	#235	#416	38	#242	149
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	681	797	829	280	1211
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.83	0.83	0.32	0.96	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	677	38	213	869	162	67	97	85	284	149
v/c Ratio	0.40	0.90	0.10	0.83	0.94	0.30	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	47.9	9.9	54.8	34.9	2.0	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	47.9	9.9	54.8	34.9	2.0	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	174	0	42	~260	0	16	8	0	118	13
Queue Length 95th (ft)	61	#273	23	m#76	m#359	m2	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	532	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.90	0.10	0.83	0.94	0.30	0.26	0.25	0.22	0.53	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	783	154	391	955	377	144	435	274	383	278	256
v/c Ratio	0.88	0.46	0.25	0.76	0.83	0.50	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	52.6	11.8	2.2	31.9	22.7	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	11.8	2.2	31.9	22.7	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	75	56	4	105	240	26	71	74	0	95	129	0
Queue Length 95th (ft) m#168	m63	m7	#153	#330	37	#157	118	65	#188	#230	58	
Internal Link Dist (ft)	320			520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1146	751	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.46	0.25	0.76	0.83	0.50	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1610	72	1342	209	25	370	370	369
v/c Ratio	0.69	0.51	0.67	0.13	0.05	0.84	0.88	0.66
Control Delay	8.7	55.9	11.2	0.1	9.8	43.2	48.5	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	55.9	11.2	0.1	9.8	43.2	48.5	26.4
Queue Length 50th (ft)	133	39	139	0	2	169	172	133
Queue Length 95th (ft)	170	m62	m155	m0	18	#318	#329	224
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2321	142	2000	1583	568	475	455	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.51	0.67	0.13	0.04	0.78	0.81	0.62

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1724	287	1045	368	575	161	161	18
v/c Ratio	0.14	0.60	0.18	0.52	0.23	0.91	0.24	0.24	0.03
Control Delay	38.5	20.4	0.2	14.7	0.3	40.3	12.8	12.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	20.4	0.2	14.7	0.3	40.3	12.8	12.8	8.6
Queue Length 50th (ft)	10	221	0	81	0	245	46	46	4
Queue Length 95th (ft)	m13	m275	m0	131	m0	#413	76	76	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2866	1583	2020	1583	730	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.60	0.18	0.52	0.23	0.79	0.20	0.20	0.02

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1205	574	148	999	226	475	236	107	242	193
v/c Ratio	0.51	1.09	0.64	0.60	0.68	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	19.3	71.8	7.2	46.8	28.1	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	71.8	8.7	46.8	28.1	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	50	~401	0	69	153	114	120	0	54	62	0
Queue Length 95th (ft)	69	#485	90	#187	#249	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1107	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	155	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.09	0.78	0.60	0.68	0.66	0.67	0.45	0.31	0.34	0.40

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	194	338	520	114	182	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.37	0.95	0.81	0.18	1.02	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	108.8	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	108.8	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	~83	146	0
Queue Length 95th (ft)	#162	#221	#155	184	45	#296	#358	30	#200	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	531	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.37	0.95	0.81	0.18	1.02	0.79	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	107	773	56	862	351	51	91	511	132	
v/c Ratio	0.67	0.63	0.47	0.80	0.58	0.43	0.44	0.80	0.18	
Control Delay	64.2	30.5	38.5	25.0	6.6	52.2	21.8	35.9	5.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	64.2	30.5	38.5	25.0	6.6	52.2	21.8	35.9	5.8	
Queue Length 50th (ft)	61	215	32	260	4	28	14	237	10	
Queue Length 95th (ft)	#161	#317	m60	#366	20	65	57	#388	43	
Internal Link Dist (ft)		6630		350			200		236	
Turn Bay Length (ft)	225		150		80	50		225		
Base Capacity (vph)	159	1232	118	1077	603	118	367	653	782	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.67	0.63	0.47	0.80	0.58	0.43	0.25	0.78	0.17	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	461	104	1033	673	223
v/c Ratio	0.58	0.59	0.39	0.50	0.61	0.38
Control Delay	12.5	8.4	48.0	19.9	28.6	14.2
Queue Delay	0.2	0.4	0.0	0.4	0.0	0.0
Total Delay	12.7	8.8	48.0	20.2	28.6	14.2
Queue Length 50th (ft)	121	67	58	250	164	48
Queue Length 95th (ft)	150	m106	m102	311	222	108
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	779	295	2084	1106	583
Starvation Cap Reductn	141	69	0	490	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.65	0.35	0.65	0.61	0.38
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	455	248
v/c Ratio	0.62	0.26	0.64	0.71
Control Delay	3.6	5.8	36.1	40.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	5.8	36.1	40.3
Queue Length 50th (ft)	0	58	123	119
Queue Length 95th (ft)	243	112	152	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2491	2491	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.37	0.43
Intersection Summary				

**CUMULATIVE 2020 + ALTERNATIVE D
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	16	263	22	134	14	736	74	186	508	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	14	17	277	23	141	15	775	78	196	535	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1814	1810	536	1793	1773	814	538			853		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1814	1810	536	1793	1773	814	538			853		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	77	97	0	62	63	99			75		
cM capacity (veh/h)	22	58	544	40	61	378	1030			786		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	441	15	853	196	538						
Volume Left	0	277	15	0	196	0						
Volume Right	17	141	0	78	0	3						
cSH	115	58	1030	1700	786	1700						
Volume to Capacity	0.27	7.66	0.01	0.50	0.25	0.32						
Queue Length 95th (ft)	25	Err	1	0	25	0						
Control Delay (s)	47.4	Err	8.5	0.0	11.1	0.0						
Lane LOS	E	F	A		B							
Approach Delay (s)	47.4	Err	0.1		3.0							
Approach LOS	E	F										
Intersection Summary												
Average Delay		2129.6										
Intersection Capacity Utilization		85.9%		ICU Level of Service		E						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	170	94	431	280	9	130	25	558	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	99	454	295	9	137	26	587	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			278			1472	1461	228	2057	1506	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			278			1472	1461	228	2057	1506	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			65			0	68	28	0	86	99
cM capacity (veh/h)	1257			1285			67	83	811	6	78	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	288	758	751	32								
Volume Left	11	454	137	11								
Volume Right	99	9	587	11								
cSH	1257	1285	244	17								
Volume to Capacity	0.01	0.35	3.07	1.85								
Queue Length 95th (ft)	1	40	Err	112								
Control Delay (s)	0.4	7.2	Err	865.7								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.4	7.2	Err	865.7								
Approach LOS			F	F								
Intersection Summary												
Average Delay		4122.4										
Intersection Capacity Utilization		112.8%		ICU Level of Service		H						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	718	10	9	702	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	756	11	9	739	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	748			766			1561	1549	761	1561	1550	744
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	748			766			1561	1549	761	1561	1550	744
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			87	91	97	87	91	97
cM capacity (veh/h)	860			847			81	111	405	81	111	415
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	777	758	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	860	847	126	126								
Volume to Capacity	0.01	0.01	0.25	0.25								
Queue Length 95th (ft)	1	1	23	23								
Control Delay (s)	0.3	0.3	42.9	42.8								
Lane LOS	A	A	E	E								
Approach Delay (s)	0.3	0.3	42.9	42.8								
Approach LOS			E	E								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization		54.2%		ICU Level of Service		A						
Analysis Period (min)		15										



















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	718	10	9	702	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	756	11	9	739	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	748			766			1556	1549	761	1556	1545	739
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	748			766			1556	1549	761	1556	1545	739
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			87	91	97	87	91	97
cM capacity (veh/h)	860			847			82	111	405	81	112	417
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	777	9	739	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	860	847	1700	1700	126	127						
Volume to Capacity	0.01	0.01	0.43	0.01	0.25	0.25						
Queue Length 95th (ft)	1	1	0	0	23	23						
Control Delay (s)	0.3	9.3	0.0	0.0	42.7	42.5						
Lane LOS	A	A			E	E						
Approach Delay (s)	0.3	0.1			42.7	42.5						
Approach LOS					E	E						
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization		56.4%		ICU Level of Service		B						
Analysis Period (min)		15										



















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Sign Control	Free			Free			Stop			Stop									
Grade	0%			0%			0%			0%									
Volume (veh/h)	40	657	41	188	667	189	44	14	396	180	31	11							
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95							
Hourly flow rate (vph)	42	692	43	198	702	199	46	15	417	189	33	12							
Pedestrians																			
Lane Width (ft)																			
Walking Speed (ft/s)																			
Percent Blockage																			
Right turn flare (veh)																			
Median type							None			None									
Median storage (veh)																			
Upstream signal (ft)																			
pX, platoon unblocked																			
vC, conflicting volume	901				735				1572	2094	367	2052	2016	451					
vC1, stage 1 conf vol																			
vC2, stage 2 conf vol																			
vCu, unblocked vol	901				735				1572	2094	367	2052	2016	451					
tC, single (s)	4.1				4.1				7.5	6.5	6.9	7.5	6.5	6.9					
tC, 2 stage (s)																			
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3					
p0 queue free %	94				77				0	61	34	0	22	98					
cM capacity (veh/h)	750				866				22	38	630	6	42	556					
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1											
Volume Total	42	461	274	198	468	433	478	234											
Volume Left	42	0	0	198	0	0	46	189											
Volume Right	0	0	43	0	0	199	417	12											
cSH	750	1700	1700	866	1700	1700	150	7											
Volume to Capacity	0.06	0.27	0.16	0.23	0.28	0.25	3.19	31.91											
Queue Length 95th (ft)	4	0	0	22	0	0	Err	Err											
Control Delay (s)	10.1	0.0	0.0	10.4	0.0	0.0	Err	Err											
Lane LOS	B				B				F	F									
Approach Delay (s)	0.5				1.9				Err	Err									
Approach LOS										F			F						
Intersection Summary																			
Average Delay				2750.9															
Intersection Capacity Utilization				83.1%			ICU Level of Service								E				
Analysis Period (min)				15															

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Sign Control	Free			Free				Stop			Stop			
Grade	0%				0%			0%			0%			
Volume (veh/h)	53	907	273	509	782	273	143	105	559	217	41	119		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	56	955	287	536	823	287	151	111	588	228	43	125		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type								None					None	
Median storage veh														
Upstream signal (ft)	630													
pX, platoon unblocked														
vC, conflicting volume	1111				1242				2840	3392	621	3271	3392	555
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	1111				1242				2840	3392	621	3271	3392	555
tC, single (s)	4.1				4.1				7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91				4				0	0	0	0	0	74
cM capacity (veh/h)	625				556				0	0	430	0	0	475
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	56	636	606	536	549	562	849	397						
Volume Left	56	0	0	536	0	0	151	228						
Volume Right	0	0	287	0	0	287	588	125						
cSH	625	1700	1700	556	1700	1700	0	0						
Volume to Capacity	0.09	0.37	0.36	0.96	0.32	0.33	Err	Err						
Queue Length 95th (ft)	7	0	0	324	0	0	Err	Err						
Control Delay (s)	11.3	0.0	0.0	56.8	0.0	0.0	Err	Err						
Lane LOS	B				F				F					F
Approach Delay (s)	0.5				18.5				Err					Err
Approach LOS										F				F
Intersection Summary														
Average Delay				Err										
Intersection Capacity Utilization	127.4%			ICU Level of Service			H							
Analysis Period (min)	15													

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1649	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1649	
Volume (vph)	153	1274	255	73	778	730	556	103	350	453	70	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	161	1341	268	77	819	768	585	108	368	477	74	242
RTOR Reduction (vph)	0	0	57	0	0	232	0	0	342	0	73	0
Lane Group Flow (vph)	161	1341	211	77	819	536	585	108	26	477	243	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	47.5	47.5	47.5	53.5	53.5	53.5	19.5	10.9	10.9	30.1	21.5	
Effective Green, g (s)	48.0	48.0	48.0	54.0	54.0	54.0	20.0	11.4	11.4	30.6	22.0	
Actuated g/C Ratio	0.30	0.30	0.30	0.34	0.34	0.34	0.12	0.07	0.07	0.19	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	531	1017	432	567	597	534	221	252	113	657	227	
v/s Ratio Prot	0.09	c0.40		0.05	c0.46		c0.33	0.03		0.14	c0.15	
v/s Ratio Perm			0.15			0.34			0.02			
v/c Ratio	0.30	1.32	0.49	0.14	1.37	1.00	2.65	0.43	0.23	0.73	1.07	
Uniform Delay, d1	43.1	56.0	45.9	36.8	53.0	53.0	70.0	71.2	70.2	60.8	69.0	
Progression Factor	1.00	1.00	1.00	0.84	0.87	0.95	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	150.3	0.9	0.4	175.3	34.7	754.0	1.2	1.1	4.0	79.2	
Delay (s)	43.4	206.3	46.8	31.3	221.4	85.1	824.0	72.4	71.2	64.8	148.2	
Level of Service	D	F	D	C	F	F	F	E	E	E	F	
Approach Delay (s)		167.4			149.7			486.4			98.0	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		215.4										
HCM Volume to Capacity ratio		1.48										
Actuated Cycle Length (s)		160.0										
Intersection Capacity Utilization		140.8%										
Analysis Period (min)		15										
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3041	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3041	
Volume (vph)	0	1398	682	77	945	0	0	0	0	355	288	633
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1472	718	81	995	0	0	0	0	374	303	666
RTOR Reduction (vph)	0	0	169	0	0	0	0	0	0	0	75	0
Lane Group Flow (vph)	0	1472	549	81	995	0	0	0	0	374	894	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases			4									
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	988	
v/s Ratio Prot		c0.42		0.02	c0.28							
v/s Ratio Perm			0.35							0.23	0.29	
v/c Ratio		0.90	0.75	0.39	0.49					0.72	1.18dr	
Uniform Delay, d1		19.7	17.6	36.1	10.1					23.7	25.8	
Progression Factor		1.40	1.75	1.18	1.47					1.00	1.00	
Incremental Delay, d2		0.8	0.7	0.9	0.6					8.1	13.2	
Delay (s)		28.4	31.4	43.3	15.4					31.9	39.1	
Level of Service		C	C	D	B					C	D	
Approach Delay (s)		29.4			17.5				0.0		37.1	
Approach LOS		C			B				A		D	
Intersection Summary												
HCM Average Control Delay		28.9										
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		80.0								8.0		
Intersection Capacity Utilization		81.3%									D	
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												













10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3520		1681	1690	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3520		1681	1690	2787	1770	1723	
Volume (vph)	0	766	988	499	451	17	573	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	806	1040	525	475	18	603	19	601	9	9	9
RTOR Reduction (vph)	0	0	594	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	806	446	525	490	0	303	319	124	9	11	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)		17.5	17.5	12.5	34.5		16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)		18.0	18.0	13.0	35.0		16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio		0.22	0.22	0.16	0.44		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1144	356	558	1540		347	349	575	365	355	
v/s Ratio Prot		0.16		c0.15	0.14		0.18	c0.19		0.01	c0.01	
v/s Ratio Perm			c0.28						0.04			
v/c Ratio		0.70	1.25	0.94	0.32		0.87	0.91	0.22	0.02	0.03	
Uniform Delay, d1		28.6	31.0	33.1	14.7		30.7	31.1	26.4	25.3	25.4	
Progression Factor		1.47	4.29	1.22	1.25		1.00	0.99	2.28	1.00	1.00	
Incremental Delay, d2		1.9	124.8	21.7	0.5		20.2	25.4	0.7	0.1	0.2	
Delay (s)		43.7	257.7	62.2	18.8		50.9	56.2	60.9	25.5	25.5	
Level of Service		D	F	E	B		D	E	E	C	C	
Approach Delay (s)		164.3			41.2			57.2			25.5	
Approach LOS		F			D			E			C	
Intersection Summary												
HCM Average Control Delay	101.1			HCM Level of Service				F				
HCM Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	88.7%			ICU Level of Service				E				
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1212	863	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1276	908	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	80
Lane Group Flow (vph)	144	1276	970	0	107	28
Turn Type	Prot				Perm	
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	8.6	50.5	37.4		20.5	20.5
Effective Green, g (s)	9.1	51.0	37.9		21.0	21.0
Actuated g/C Ratio	0.11	0.64	0.47		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	391	2256	1660		465	416
v/s Ratio Prot	0.04	c0.36	0.28		c0.06	
v/s Ratio Perm						0.02
v/c Ratio	0.37	0.57	0.58		0.23	0.07
Uniform Delay, d1	32.8	8.2	15.3		23.2	22.2
Progression Factor	0.81	2.25	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.8	1.5		1.2	0.3
Delay (s)	27.1	19.3	16.8		24.3	22.5
Level of Service	C	B	B		C	C
Approach Delay (s)		20.1	16.8		23.4	
Approach LOS		C	B		C	
Intersection Summary						
HCM Average Control Delay	19.1			HCM Level of Service		B
HCM Volume to Capacity ratio	0.47					
Actuated Cycle Length (s)	80.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	45.8%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	727	3	47	8	3	5	552	413	2	7	616	866
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	765	3	49	8	3	5	581	435	2	7	648	912
RTOR Reduction (vph)	0	0	37	0	5	0	0	1	0	0	0	558
Lane Group Flow (vph)	383	385	12	0	11	0	581	436	0	7	648	354
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	19.8	19.8	19.8		1.5		27.1	39.2		1.5	13.6	13.6
Effective Green, g (s)	20.3	20.3	20.3		2.0		27.6	39.7		2.0	14.1	14.1
Actuated g/C Ratio	0.25	0.25	0.25		0.02		0.35	0.50		0.02	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	427	428	402		44		611	1755		44	624	279
v/s Ratio Prot	0.23	c0.23			c0.01		c0.33	0.12		0.00	0.18	
v/s Ratio Perm			0.01									c0.22
v/c Ratio	0.90	0.90	0.03		0.25		0.95	0.25		0.16	1.04	1.27
Uniform Delay, d1	28.8	28.9	22.5		38.3		25.5	11.6		38.2	33.0	33.0
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.19	1.15	2.17
Incremental Delay, d2	20.9	21.1	0.0		3.0		24.8	0.3		0.2	22.7	124.2
Delay (s)	49.7	50.0	22.5		41.3		50.3	11.9		45.4	60.6	195.7
Level of Service	D	D	C		D		D	B		D	E	F
Approach Delay (s)		48.2			41.3			33.8			139.2	
Approach LOS		D			D			C			F	
Intersection Summary												
HCM Average Control Delay		85.6								F		
HCM Volume to Capacity ratio		0.98										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		97.5%								F		
Analysis Period (min)		15										
c Critical Lane Group												














13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	59	765	332	0	784
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	62	805	349	0	825
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1805	980			1155	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1805	980			1155	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	80			100	
cM capacity (veh/h)	87	303			605	
Direction, Lane #						
Volume Total	62	1155	825			
Volume Left	0	0	0			
Volume Right	62	349	0			
cSH	303	1700	1700			
Volume to Capacity	0.20	0.68	0.49			
Queue Length 95th (ft)	19	0	0			
Control Delay (s)	19.9	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	19.9	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		70.8%			ICU Level of Service	C
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations				 	 		
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	144	31	12	359	363	25	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	152	33	13	378	382	26	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	609	204	408				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	609	204	408				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	64	96	99				
cM capacity (veh/h)	422	803	1147				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	152	33	13	189	189	255	154
Volume Left	152	0	13	0	0	0	0
Volume Right	0	33	0	0	0	0	26
cSH	422	803	1147	1700	1700	1700	1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15	0.09
Queue Length 95th (ft)	40	3	1	0	0	0	0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	16.7		0.3			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay	3.2						
Intersection Capacity Utilization	25.5%			ICU Level of Service		A	
Analysis Period (min)	15						













16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↖	↗	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	468	628	253	248	537
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	493	661	266	261	565
RTOR Reduction (vph)	0	301	0	151	0	0
Lane Group Flow (vph)	266	192	661	115	261	565
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.8	13.8	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	803	682	281	1217
v/s Ratio Prot	c0.15		c0.35		c0.15	
v/s Ratio Perm			0.12		0.07	
v/c Ratio	0.69	0.55	0.82	0.17	0.93	0.46
Uniform Delay, d1	22.6	21.8	15.8	11.0	26.1	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	1.9	9.3	0.5	34.9	1.3
Delay (s)	27.5	23.7	25.1	11.5	61.0	6.7
Level of Service	C	C	C	B	E	A
Approach Delay (s)	25.0		21.2			23.9
Approach LOS	C		C			C
Intersection Summary						
HCM Average Control Delay		23.2		HCM Level of Service		C
HCM Volume to Capacity ratio		0.81				
Actuated Cycle Length (s)		62.9		Sum of lost time (s)		12.0
Intersection Capacity Utilization		70.8%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						













17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	628	53	116	743	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	661	56	122	782	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	44	0	0	76	0	57	70	0	55	0
Lane Group Flow (vph)	87	661	12	122	782	21	73	42	19	296	89	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	16.5	16.5	4.4	16.5	16.5	4.4	16.7	16.7	24.4	36.7	
Effective Green, g (s)	4.9	17.0	17.0	4.9	17.0	17.0	4.9	17.2	17.2	24.9	37.2	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.21	0.21	0.31	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	752	336	210	752	336	210	339	323	551	774	
v/s Ratio Prot	0.05	c0.19		0.04	c0.22		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.81	0.88	0.04	0.58	1.04	0.06	0.35	0.13	0.06	0.54	0.12	
Uniform Delay, d1	37.1	30.5	25.0	36.6	31.5	25.1	36.0	25.3	25.0	22.8	12.1	
Progression Factor	1.00	1.00	1.00	0.97	0.51	0.23	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	33.9	11.4	0.0	2.6	37.4	0.0	1.0	0.8	0.4	1.0	0.3	
Delay (s)	70.9	41.9	25.0	38.1	53.5	5.7	37.0	26.1	25.3	23.8	12.4	
Level of Service	E	D	C	D	D	A	D	C	C	C	B	
Approach Delay (s)		43.9			47.0			28.9			20.1	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM Average Control Delay		39.4			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		58.5%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Volume (vph)	216	743	163	377	854	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	782	172	397	899	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	69	267	0	0	198
Lane Group Flow (vph)	227	782	57	397	899	108	182	443	101	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.15		0.12	c0.25		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.47	0.11	0.77	0.79	0.21	0.87	0.71	0.36	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.3	18.7	32.7	24.7	19.8	34.6	30.1	28.0	34.0	30.7	26.3
Progression Factor	0.77	0.56	0.46	0.81	0.76	0.69	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	0.7	0.3	5.5	4.4	0.7	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	37.7	12.7	8.9	32.0	23.2	14.3	63.7	33.8	28.8	45.1	46.1	26.5
Level of Service	D	B	A	C	C	B	E	C	C	D	D	C
Approach Delay (s)		16.9			23.5			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		28.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2020 + Alternative D

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑↑↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Flt	0.97	1.00	1.00	1.00	0.85	0.90	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	0.95	1.00	1.00	1.00	0.99	0.95	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	4926	1770	3539	1583	1583	1653	1681	1686	1583	1583	1583	1583
Flt Permitted	1.00	0.95	1.00	1.00	1.00	0.92	0.74	0.71	1.00	1.00	1.00	1.00
Satd. Flow (perm)	4926	1770	3539	1583	1583	1548	1312	1255	1583	1583	1583	1583
Volume (vph)	0	1259	333	68	1113	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1325	351	72	1172	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	54	0	0	0	0	0	12	0	0	0	41
Lane Group Flow (vph)	0	1622	0	72	1172	268	0	12	0	322	322	408
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases	4			3	8			2			6	
Permitted Phases					Free	2				6		6
Actuated Green, G (s)	37.0			5.0	46.5	80.0		24.5		24.5	24.5	24.5
Effective Green, g (s)	37.5			5.5	47.0	80.0		25.0		25.0	25.0	25.0
Actuated g/C Ratio	0.47			0.07	0.59	1.00		0.31		0.31	0.31	0.31
Clearance Time (s)	4.5			4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2309			122	2079	1583		484		410	392	495
v/s Ratio Prot	c0.33			0.04	c0.33							
v/s Ratio Perm						0.17		0.01		0.25	0.26	c0.26
v/c Ratio	0.70			0.59	0.56	0.17		0.02		0.79	0.82	0.83
Uniform Delay, d1	16.8			36.2	10.2	0.0		19.0		25.1	25.4	25.5
Progression Factor	0.45			1.23	0.75	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4			5.6	0.8	0.2		0.0		9.5	13.0	10.7
Delay (s)	9.1			50.0	8.4	0.2		19.1		34.6	38.4	36.2
Level of Service	A			D	A	A		B		C	D	D
Approach Delay (s)	9.1				9.0			19.1			36.4	
Approach LOS	A				A			B			D	
Intersection Summary												
HCM Average Control Delay	16.0					HCM Level of Service		B				
HCM Volume to Capacity ratio	0.75											
Actuated Cycle Length (s)	80.0					Sum of lost time (s)		12.0				
Intersection Capacity Utilization	70.5%					ICU Level of Service		C				
Analysis Period (min)	15											
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2020 + Alternative D

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.98	0.98
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.96	0.96
Satd. Flow (prot)	1770	6408	1583	5085	1583	1770	1504	1504	1748	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.83	0.83	0.83	0.83
Satd. Flow (perm)	1770	6408	1583	5085	1583	1389	1504	1504	1515	1515	1515	1515
Volume (vph)	21	1563	298	0	849	383	582	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1645	314	0	894	403	613	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	1	1	0	2	0	0
Lane Group Flow (vph)	22	1645	314	0	894	403	613	180	181	0	16	0
Turn Type				Prot	Free	Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				Free		Free	2		2		6	
Actuated Green, G (s)	2.2	33.4	80.0		26.7	80.0	37.6	37.6	37.6		37.6	
Effective Green, g (s)	2.7	33.9	80.0		27.2	80.0	38.1	38.1	38.1		38.1	
Actuated g/C Ratio	0.03	0.42	1.00		0.34	1.00	0.48	0.48	0.48		0.48	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	2715	1583		1729	1583	662	716	716		722	
v/s Ratio Prot	0.01	c0.26			0.18		0.12					
v/s Ratio Perm			0.20			0.25	c0.44		0.12		0.01	
v/c Ratio	0.37	0.61	0.20		0.52	0.25	0.93	0.25	0.25		0.02	
Uniform Delay, d1	37.8	17.9	0.0		21.1	0.0	19.6	12.5	12.5		11.1	
Progression Factor	1.11	1.20	1.00		0.71	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.6	0.7	0.2		0.8	0.3	18.9	0.2	0.2		0.0	
Delay (s)	44.4	22.1	0.2		15.7	0.3	38.5	12.7	12.7		11.1	
Level of Service	D	C	A		B	A	D	B	B		B	
Approach Delay (s)	18.9				10.9		28.9				11.1	
Approach LOS	B				B		C				B	
Intersection Summary												
HCM Average Control Delay	18.7					HCM Level of Service		B				
HCM Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	80.0					Sum of lost time (s)		8.0				
Intersection Capacity Utilization	65.5%					ICU Level of Service		C				
Analysis Period (min)	15											
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4912	1610	3330	1583	1610	3387	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4912	1610	3330	1583	1610	3387	1583	1583
Volume (vph)	235	1228	462	165	690	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1293	486	174	726	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	346	0	62	0	0	204	0	0	131	0
Lane Group Flow (vph)	247	1293	140	174	877	0	229	483	50	181	380	29
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Perm
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	12.6	22.6	22.6	10.0	20.0	15.4	15.4	15.4	14.0	14.0	14.0	14.0
Effective Green, g (s)	13.1	23.1	23.1	10.5	20.5	15.9	15.9	15.9	14.5	14.5	14.5	14.5
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.26	0.20	0.20	0.20	0.18	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	562	1022	457	232	1259	320	662	315	292	614	287	287
v/s Ratio Prot	0.07	c0.37	0.10	c0.18	0.14	c0.15	c0.11	0.11	0.11	0.11	0.11	0.11
v/s Ratio Perm	0.44	1.27	0.31	0.75	0.70	0.72	0.73	0.16	0.62	0.62	0.02	0.02
v/c Ratio	0.44	1.27	0.31	0.75	0.70	0.72	0.73	0.16	0.62	0.62	0.02	0.10
Uniform Delay, d1	30.1	28.4	22.2	33.5	26.9	29.9	30.0	26.5	30.2	30.2	27.3	27.3
Progression Factor	0.48	0.48	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	126.1	1.5	12.8	3.2	7.4	4.0	0.2	3.9	1.9	0.2	0.2
Delay (s)	15.0	139.6	15.8	46.2	30.1	37.4	34.1	26.8	34.1	32.1	27.5	27.5
Level of Service	B	F	B	D	C	D	C	C	C	C	C	C
Approach Delay (s)	94.7	94.7	32.7	32.7	32.7	32.7	32.7	31.6	31.6	31.6	31.6	31.6
Approach LOS	F	F	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	58.6	58.6	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
HCM Volume to Capacity ratio	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Actuated Cycle Length (s)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Intersection Capacity Utilization	79.3%	79.3%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Volume (vph)	149	583	228	140	661	194	323	483	113	184	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	204	340	508	119	194	377	247
RTOR Reduction (vph)	0	59	0	0	154	0	0	78	0	0	181	0
Lane Group Flow (vph)	157	795	0	147	696	50	340	508	41	194	377	66
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	5.5	16.5	5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5	16.5
Effective Green, g (s)	6.0	17.0	6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24	0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	823	152	859	384	354	639	543	177	452	384	384
v/s Ratio Prot	c0.09	c0.23	0.08	0.20	c0.19	c0.27	0.11	0.20	0.11	0.20	0.11	0.11
v/s Ratio Perm	1.03	0.97	0.97	0.81	0.13	0.96	0.79	0.08	1.10	0.83	0.04	0.04
v/c Ratio	1.03	0.97	0.97	0.81	0.13	0.96	0.79	0.08	1.10	0.83	0.17	0.17
Uniform Delay, d1	32.0	26.2	31.9	25.0	20.7	27.7	20.8	15.5	31.5	25.2	20.9	20.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.0	23.1	62.4	5.8	0.2	37.3	9.9	0.3	95.7	16.4	1.0	1.0
Delay (s)	114.0	49.3	94.3	30.8	20.9	65.0	30.6	15.8	127.2	41.6	21.9	21.9
Level of Service	F	D	F	C	C	E	C	B	F	D	C	C
Approach Delay (s)	59.4	59.4	37.8	37.8	40.9	40.9	55.9	55.9	55.9	55.9	55.9	55.9
Approach LOS	E	E	D	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM Average Control Delay	48.1	48.1	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
HCM Volume to Capacity ratio	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Actuated Cycle Length (s)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Intersection Capacity Utilization	81.2%	81.2%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3518		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3518		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	785	32	53	878	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	826	34	56	924	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	3	0	0	0	151	0	57	0	0	61	0
Lane Group Flow (vph)	128	857	0	56	924	276	51	34	0	623	84	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.5	21.8		4.4	20.7	20.7	3.3	6.4		39.4	42.5	
Effective Green, g (s)	6.0	22.3		4.9	21.2	21.2	3.8	6.9		39.9	43.0	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	872		96	834	373	75	128		785	783	
v/s Ratio Prot	0.07	c0.24		0.03	c0.26		c0.03	0.02		c0.35	c0.05	
v/s Ratio Perm						0.17						
v/c Ratio	1.08	0.98		0.58	1.11	0.74	0.68	0.26		0.79	0.11	
Uniform Delay, d1	42.0	33.7		41.6	34.4	31.8	42.5	39.2		21.5	12.9	
Progression Factor	1.00	1.00		0.67	0.59	0.25	1.00	1.00		1.00	1.00	
Incremental Delay, d2	107.4	26.6		7.5	63.2	10.7	22.4	1.1		5.5	0.1	
Delay (s)	149.4	60.2		35.2	83.4	18.8	64.9	40.3		27.1	13.0	
Level of Service	F	E		D	F	B	E	D		C	B	
Approach Delay (s)		71.8			61.9			49.1			24.4	
Approach LOS		E			E			D			C	
Intersection Summary												
HCM Average Control Delay		55.6										
HCM Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		90.0						20.0				
Intersection Capacity Utilization		80.9%										
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	953	489	66	1079	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	515	69	1136	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	111	0	0	0	0	0	0	0	57	0
Lane Group Flow (vph)	0	1003	404	69	1136	0	0	0	0	674	215	0
Turn Type				Perm	Prot					Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.32					c0.20	0.14	
v/s Ratio Perm			0.26									
v/c Ratio		0.69	0.62	0.29	0.55					0.61	0.42	
Uniform Delay, d1		21.9	21.0	35.1	11.2					25.7	23.9	
Progression Factor		0.46	0.42	1.24	1.64					1.00	1.00	
Incremental Delay, d2		1.5	2.4	0.6	1.0					1.0	2.5	
Delay (s)		11.4	11.3	44.1	19.3					26.7	26.5	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		11.4			20.7				0.0		26.6	
Approach LOS		B			C				A		C	
Intersection Summary												
HCM Average Control Delay		18.4										
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		90.0								8.0		
Intersection Capacity Utilization		67.7%										
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	456	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	480	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	480	273
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	60.1			60.1	20.9	20.9
Effective Green, g (s)	60.6			60.6	21.4	21.4
Actuated g/C Ratio	0.67			0.67	0.24	0.24
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2383			2383	816	376
v/s Ratio Prot	c0.47			0.20	0.14	
v/s Ratio Perm					c0.17	
v/c Ratio	0.70			0.30	0.59	0.73
Uniform Delay, d1	9.1			6.0	30.4	31.6
Progression Factor	0.37			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.3	1.1	6.9
Delay (s)	4.7			6.4	31.5	38.5
Level of Service	A			A	C	D
Approach Delay (s)	4.7			6.4	34.1	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay		12.2			HCM Level of Service	B
HCM Volume to Capacity ratio		0.71				
Actuated Cycle Length (s)		90.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		67.7%			ICU Level of Service	C
Analysis Period (min)		15				
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↑	↗	↖	↖	↕
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	11	5	8	23	25	234	7	787	26	132	669	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	5	8	24	26	246	7	828	27	139	704	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1551	1856	356	1484	1833	414	712			856		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1551	1856	356	1484	1833	414	712			856		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	91	99	65	57	58	99			82		
cM capacity (veh/h)	26	59	641	68	61	587	884			780		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	297	7	414	414	27	139	469	242			
Volume Left	12	24	7	0	0	0	139	0	0			
Volume Right	8	246	0	0	0	27	0	0	7			
cSH	46	381	884	1700	1700	1700	780	1700	1700			
Volume to Capacity	0.55	0.78	0.01	0.24	0.24	0.02	0.18	0.28	0.14			
Queue Length 95th (ft)	51	163	1	0	0	0	16	0	0			
Control Delay (s)	153.9	39.9	9.1	0.0	0.0	0.0	10.6	0.0	0.0			
Lane LOS	F	E	A				B					
Approach Delay (s)	153.9	39.9	0.1				1.7					
Approach LOS	F	E										
Intersection Summary												
Average Delay			8.5									
Intersection Capacity Utilization			49.6%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	265	2	16	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	17	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	19	1								
Volume Left	1	7	17	0								
Volume Right	5	2	2	0								
cSH	1281	1402	526	488								
Volume to Capacity	0.00	0.01	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.1	0.2	12.1	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.1	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization		33.2%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										






















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel













2020 + Alternative D
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 			 			 		
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								None			None		
Median storage veh													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	237			193			493	493	181	521	505	237	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	237			193			493	493	181	521	505	237	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	100			97			75	100	97	100	100	100	
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	193	275	147	0									
Volume Left	0	38	120	0									
Volume Right	24	0	27	0									
cSH	1330	1381	519	1700									
Volume to Capacity	0.00	0.03	0.28	0.00									
Queue Length 95th (ft)	0	2	29	0									
Control Delay (s)	0.0	1.3	14.7	0.0									
Lane LOS		A	B	A									
Approach Delay (s)	0.0	1.3	14.7	0.0									
Approach LOS			B	A									
Intersection Summary													
Average Delay			4.1										
Intersection Capacity Utilization		41.6%			ICU Level of Service				A				
Analysis Period (min)		15											

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	     					
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS	B					
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS	B					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization	22.4%		ICU Level of Service		A	
Analysis Period (min)			15			

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	161	1341	268	77	819	768	585	108	368	477	316
v/c Ratio	0.30	1.32	0.55	0.14	1.37	1.00	2.65	0.43	0.81	0.73	1.05
Control Delay	45.1	193.6	36.6	31.6	211.6	55.8	778.1	75.6	20.8	68.1	113.0
Queue Delay	0.0	278.1	0.0	0.0	95.1	44.0	0.0	0.0	25.5	421.4	0.0
Total Delay	45.1	471.7	36.6	31.6	306.7	99.8	778.1	75.6	46.3	489.4	113.0
Queue Length 50th (ft)	130	~991	180	50	~1215	~427	~1028	58	0	243	~279
Queue Length 95th (ft)	199	#1137	289	m74m	#1436	m#818	#1271	89	110	#350	#485
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	490	567	597	766	221	376	497	656	300
Starvation Cap Reductn	0	0	0	0	80	83	0	0	0	0	0
Spillback Cap Reductn	0	325	0	0	0	0	0	0	133	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.94	0.55	0.14	1.58	1.12	2.65	0.29	1.01	1.93	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1472	718	81	995	374	969
v/c Ratio	0.88	0.78	0.32	0.49	0.72	1.18dr
Control Delay	28.3	18.3	44.1	15.7	32.9	37.2
Queue Delay	126.9	32.0	0.0	0.2	0.0	40.7
Total Delay	155.2	50.2	44.1	15.9	32.9	77.9
Queue Length 50th (ft)	383	247	19	150	179	226
Queue Length 95th (ft)	m283	m190	m29	m221	#292	#356
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	918	257	2035	523	1063
Starvation Cap Reductn	533	235	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	171
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.28	1.05	0.32	0.59	0.72	1.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	806	1040	525	493	303	319	601	9	18
v/c Ratio	0.70	1.09	0.94	0.32	0.87	0.91	0.57	0.02	0.05
Control Delay	43.9	76.0	65.0	18.8	53.2	58.9	7.9	25.7	18.8
Queue Delay	0.0	77.9	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	43.9	153.8	65.0	18.8	53.2	58.9	8.3	25.7	18.8
Queue Length 50th (ft)	171	~943	148	126	115	122	9	4	4
Queue Length 95th (ft)	m177	#1289	#239	173	m#213	m#230	m38	16	21
Internal Link Dist (ft)	466		345		380			270	
Turn Bay Length (ft)			150		150		200		
Base Capacity (vph)	1144	951	558	1544	347	349	1052	365	363
Starvation Cap Reductn	0	134	0	0	0	0	0	0	0
Spillback Cap Reductn	0	24	0	0	0	0	122	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.27	0.94	0.32	0.87	0.91	0.65	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1276	975	107	108
v/c Ratio	0.37	0.57	0.59	0.23	0.22
Control Delay	28.4	19.5	17.3	24.8	6.3
Queue Delay	0.0	1.7	0.0	0.0	0.0
Total Delay	28.4	21.2	17.3	24.8	6.3
Queue Length 50th (ft)	41	292	176	42	0
Queue Length 95th (ft)	m56	324	249	83	36
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1664	465	495
Starvation Cap Reductn	0	762	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.85	0.59	0.23	0.22
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	383	385	49	16	581	437	7	648	912
v/c Ratio	0.90	0.90	0.11	0.11	1.09	0.21	0.05	0.69	0.99
Control Delay	55.1	55.2	8.0	29.3	96.8	10.3	39.6	33.0	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.9
Total Delay	55.1	55.2	8.0	29.3	96.8	10.3	39.6	33.0	45.8
Queue Length 50th (ft)	192	193	0	5	~333	42	3	168	275
Queue Length 95th (ft)	#353	#356	25	23	#524	124	m3	m#295	m#423
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	452	179	531	2076	177	945	919
Starvation Cap Reductn	0	0	0	0	0	0	0	0	63
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.87	0.11	0.09	1.09	0.21	0.04	0.69	1.07
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	493	661	266	261	565
v/c Ratio	0.68	0.76	0.83	0.32	0.93	0.46
Control Delay	32.2	14.4	27.8	3.1	69.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	14.4	27.8	3.1	69.1	7.5
Queue Length 50th (ft)	94	34	228	0	104	101
Queue Length 95th (ft)	164	#139	#416	38	#235	164
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	681	801	832	282	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.72	0.83	0.32	0.93	0.46
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	661	56	122	782	97	73	99	89	296	144
v/c Ratio	0.65	0.88	0.15	0.47	1.04	0.23	0.28	0.23	0.21	0.56	0.17
Control Delay	60.6	45.5	8.8	38.8	57.3	2.3	38.1	12.0	7.8	28.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	45.5	8.8	38.8	57.3	2.3	38.1	12.0	7.8	28.4	5.5
Queue Length 50th (ft)	43	169	0	22	~221	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#264	29	m34	m#315	m2	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	380	257	752	413	257	430	425	531	864
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.88	0.15	0.47	1.04	0.23	0.28	0.23	0.21	0.56	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	782	172	397	899	335	182	512	368	357	317	248
v/c Ratio	0.81	0.47	0.27	0.77	0.79	0.46	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	44.5	12.8	2.4	36.0	24.1	3.5	73.5	31.9	11.9	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	12.8	2.4	36.0	24.1	3.5	73.5	31.9	11.9	51.7	51.3	7.3
Queue Length 50th (ft)	69	58	5	110	240	19	92	108	16	92	151	0
Queue Length 95th (ft)	m#124	m67	m8	m#156	m287	m30	#210	163	106	#172	#279	57
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1135	734	210	752	567	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.47	0.27	0.77	0.79	0.46	0.87	0.68	0.65	0.81	0.80	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1676	72	1172	268	24	322	322	449
v/c Ratio	0.69	0.49	0.56	0.17	0.05	0.78	0.82	0.84
Control Delay	9.1	53.2	9.3	0.2	9.5	38.5	42.5	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	53.2	9.3	0.2	9.5	38.5	42.5	36.4
Queue Length 50th (ft)	145	38	133	0	2	143	146	171
Queue Length 95th (ft)	183	m62	m155	m0	17	238	#267	#284
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2415	147	2077	1583	576	476	455	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.49	0.56	0.17	0.04	0.68	0.71	0.73
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1645	314	894	403	613	181	182	18
v/c Ratio	0.17	0.61	0.20	0.47	0.25	0.92	0.25	0.25	0.02
Control Delay	40.7	23.4	0.2	15.7	0.3	40.9	12.3	12.3	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	23.4	0.2	15.7	0.3	40.9	12.3	12.3	8.3
Queue Length 50th (ft)	12	250	0	76	0	244	47	47	3
Queue Length 95th (ft)	m16	265	m0	120	m0	#456	85	86	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2714	1583	1899	1583	730	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.61	0.20	0.47	0.25	0.84	0.23	0.23	0.02
Intersection Summary									
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1293	486	174	939	229	483	254	181	380	160
v/c Ratio	0.44	1.27	0.61	0.75	0.71	0.71	0.73	0.49	0.62	0.62	0.38
Control Delay	16.9	145.9	4.6	60.0	29.2	43.2	36.9	7.4	39.4	34.4	7.7
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	145.9	5.5	60.0	29.2	43.2	36.9	7.4	39.4	34.4	7.7
Queue Length 50th (ft)	30	~431	0	88	146	116	123	0	91	96	0
Queue Length 95th (ft)	58	#534	20	#222	#216	#214	176	58	158	138	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1020	802	231	1323	342	707	536	342	720	462
Starvation Cap Reductn	0	0	121	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.27	0.71	0.75	0.71	0.67	0.68	0.47	0.53	0.53	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	204	340	508	119	194	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.38	0.96	0.79	0.19	1.10	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	130.4	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	130.4	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	~97	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	47	#298	#346	31	#214	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	539	354	639	621	177	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.38	0.96	0.79	0.19	1.10	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	↗	→	↖	←	↗	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	860	56	924	427	51	91	623	145
v/c Ratio	1.08	0.88	0.47	1.02	0.77	0.43	0.44	0.81	0.17
Control Delay	150.1	43.8	38.7	55.9	14.1	52.2	22.9	34.4	5.2
Queue Delay	0.0	0.8	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	150.1	44.6	38.7	55.9	14.6	52.2	22.9	34.4	5.2
Queue Length 50th (ft)	~82	252	29	~303	7	28	16	310	9
Queue Length 95th (ft)	#194	#377	m55	#403	#183	65	59	#556	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	118	980	118	904	552	118	366	767	844
Starvation Cap Reductn	0	0	0	0	15	0	0	0	0
Spillback Cap Reductn	0	22	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.90	0.47	1.02	0.80	0.43	0.25	0.81	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	→	↖	↗	←	↖	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	515	69	1136	674	272
v/c Ratio	0.67	0.67	0.27	0.55	0.61	0.48
Control Delay	11.8	8.6	43.4	19.6	28.6	19.9
Queue Delay	0.4	0.7	0.0	0.4	0.0	0.0
Total Delay	12.2	9.3	43.4	20.0	28.6	19.9
Queue Length 50th (ft)	147	90	38	281	164	83
Queue Length 95th (ft)	m173	m122	m74	345	222	157
Internal Link Dist (ft)		350		370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	774	295	2084	1106	567
Starvation Cap Reductn	140	68	0	399	0	0
Spillback Cap Reductn	47	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.73	0.23	0.67	0.61	0.48
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	480	287
v/c Ratio	0.70	0.30	0.59	0.74
Control Delay	5.3	7.3	32.6	40.3
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	5.4	7.3	32.6	40.3
Queue Length 50th (ft)	189	75	126	143
Queue Length 95th (ft)	250	142	150	201
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2384	2384	1221	574
Starvation Cap Reductn	60	0	0	0
Spillback Cap Reductn	0	81	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.31	0.39	0.50
Intersection Summary				

NEAR-TERM 2008 + ALTERNATIVE E
TRAFFIC CONDITIONS
(SYNCHRO)

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	8	14	222	13	97	12	795	62	91	514	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	234	14	102	13	837	65	96	541	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1654	1662	543	1646	1631	869	544			902		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1654	1662	543	1646	1631	869	544			902		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	90	97	0	84	71	99			87		
cM capacity (veh/h)	44	84	540	64	88	351	1025			754		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	349	13	902	96	544						
Volume Left	0	234	13	0	96	0						
Volume Right	15	102	0	65	0	3						
cSH	181	85	1025	1700	754	1700						
Volume to Capacity	0.13	4.11	0.01	0.53	0.13	0.32						
Queue Length 95th (ft)	11	Err	1	0	11	0						
Control Delay (s)	27.8	Err	8.6	0.0	10.5	0.0						
Lane LOS	D	F	A		B							
Approach Delay (s)	27.8	Err	0.1		1.6							
Approach LOS	D	F										
Intersection Summary												
Average Delay		1813.9										
Intersection Capacity Utilization		80.3%		ICU Level of Service		D						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	131	26	89	201	10	126	19	312	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	27	94	212	11	133	20	328	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	222			165			593	582	152	915	591	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			165			593	582	152	915	591	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			65	95	63	93	97	99
cM capacity (veh/h)	1347			1413			381	393	895	146	389	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	316	481	32								
Volume Left	11	94	133	11								
Volume Right	27	11	328	11								
cSH	1347	1413	628	281								
Volume to Capacity	0.01	0.07	0.77	0.11								
Queue Length 95th (ft)	1	5	177	9								
Control Delay (s)	0.5	2.7	27.0	19.4								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.5	2.7	27.0	19.4								
Approach LOS			D	C								
Intersection Summary												
Average Delay		14.5										
Intersection Capacity Utilization		68.7%		ICU Level of Service		C						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	433	10	10	279	20	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	456	11	11	294	21	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	315			466			823	818	461	823	813	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			466			823	818	461	823	813	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	98	96	97	99
cM capacity (veh/h)	1245			1095			277	305	600	276	307	736
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	477	325	32	32								
Volume Left	11	11	11	11								
Volume Right	11	21	11	11								
cSH	1245	1095	351	364								
Volume to Capacity	0.01	0.01	0.09	0.09								
Queue Length 95th (ft)	1	1	7	7								
Control Delay (s)	0.3	0.4	16.3	15.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.4	16.3	15.8								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization		37.5%		ICU Level of Service		A						
Analysis Period (min)		15										

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	432	10	10	279	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	455	11	11	294	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			465			817	806	460	817	806	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			465			817	806	460	817	806	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	98	96	97	99
cM capacity (veh/h)	1257			1096			280	310	601	279	310	741
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	476	315	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1257	1096	354	367								
Volume to Capacity	0.01	0.01	0.09	0.09								
Queue Length 95th (ft)	1	1	7	7								
Control Delay (s)	0.3	0.4	16.2	15.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.4	16.2	15.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization		37.4%		ICU Level of Service		A						
Analysis Period (min)		15										

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	60	315	77	116	238	99	35	6	266	112	21	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	332	81	122	251	104	37	6	280	118	22	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	355			413			1071	1097	372	1328	1086	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	355			413			1071	1097	372	1328	1086	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			89			76	96	58	0	88	98
cM capacity (veh/h)	1204			1146			156	180	674	66	183	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	476	477	323	155								
Volume Left	63	122	37	118								
Volume Right	81	104	280	15								
cSH	1204	1146	471	81								
Volume to Capacity	0.05	0.11	0.69	1.92								
Queue Length 95th (ft)	4	9	128	339								
Control Delay (s)	1.6	3.0	27.8	541.2								
Lane LOS	A	A	D	F								
Approach Delay (s)	1.6	3.0	27.8	541.2								
Approach LOS			D	F								
Intersection Summary												
Average Delay		66.3										
Intersection Capacity Utilization		80.5%		ICU Level of Service		D						
Analysis Period (min)		15										






















6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	52	493	148	187	326	89	80	45	222	88	13	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	55	519	156	197	343	94	84	47	234	93	14	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)				630								
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	437			675			1546	1537	597	1747	1568	390
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	346			675			1634	1623	597	1868	1660	292
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			79			0	28	54	0	78	92
cM capacity (veh/h)	1044			916			43	66	503	9	62	644
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	729	634	365	156								
Volume Left	55	197	84	93								
Volume Right	156	94	234	49								
cSH	1044	916	117	14								
Volume to Capacity	0.05	0.21	3.13	10.86								
Queue Length 95th (ft)	4	20	Err	Err								
Control Delay (s)	1.3	5.1	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	1.3	5.1	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay		2767.3										
Intersection Capacity Utilization		101.4%		ICU Level of Service		G						
Analysis Period (min)		15										
























7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1800		1681	1770	1583	1770	3539	1583	3433	1741	
Flt Permitted		0.99		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1800		1681	1770	1583	1770	3539	1583	3433	1741	
Volume (vph)	99	537	166	181	296	540	204	155	265	451	131	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	104	565	175	191	312	568	215	163	279	475	138	107
RTOR Reduction (vph)	0	6	0	0	0	376	0	0	256	0	17	0
Lane Group Flow (vph)	0	838	0	191	312	192	215	163	23	475	228	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		47.5		53.5	53.5	53.5	19.5	12.7	12.7	28.3	21.5	
Effective Green, g (s)		48.0		54.0	54.0	54.0	20.0	13.2	13.2	28.8	22.0	
Actuated g/C Ratio		0.30		0.34	0.34	0.34	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		540		567	597	534	221	292	131	618	239	
v/s Ratio Prot		c0.47		0.11	c0.18		c0.12	0.05		0.14	c0.13	
v/s Ratio Perm						0.12			0.01			
v/c Ratio		1.55		0.34	0.52	0.36	0.97	0.56	0.18	0.77	0.95	
Uniform Delay, d1		56.0		39.6	42.6	40.0	69.7	70.6	68.3	62.4	68.5	
Progression Factor		1.00		0.91	0.91	2.05	1.00	1.00	1.00	0.96	0.96	
Incremental Delay, d2		257.7		1.4	2.9	1.7	52.5	2.3	0.6	5.7	44.8	
Delay (s)		313.7		37.5	41.8	83.5	122.2	72.9	69.0	65.7	110.6	
Level of Service		F		D	D	F	F	E	E	E	F	
Approach Delay (s)		313.7			63.2			87.4			80.9	
Approach LOS		F			E			F			F	
Intersection Summary												
HCM Average Control Delay			136.1			HCM Level of Service					F	
HCM Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			160.0			Sum of lost time (s)					16.0	
Intersection Capacity Utilization			97.2%			ICU Level of Service					F	
Analysis Period (min)			15									
c Critical Lane Group												















8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Volume (vph)	5	30	140	5	95	95	164	155	5	30	202	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	163	5	32	213	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	2	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	163	3	32	216	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		13.8	48.9	48.9	3.3	38.4	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		14.3	49.4	49.4	3.8	38.9	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.18	0.62	0.62	0.05	0.49	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		316	2185	978	84	1715	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.55	0.07	0.00	0.38	0.13	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		29.9	6.1	5.9	37.0	11.2	
Progression Factor	1.00	1.00	1.00	0.84	1.36		1.03	0.86	0.80	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.3	0.4		1.3	0.0	0.0	2.9	0.2	
Delay (s)	39.7	32.4	32.1	33.6	44.8		32.0	5.3	4.7	39.8	11.4	
Level of Service	D	C	C	C	D		C	A	A	D	B	
Approach Delay (s)		32.3			44.5			18.9			15.0	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay	25.8			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.24											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	30.5%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑↑	↑	↑↑	↑↑					↓	↑↑			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0			
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91			
Frt		1.00	0.85	1.00	1.00					1.00	0.91			
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00			
Satd. Flow (prot)		3539	1583	3433	3539					1610	3084			
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00			
Satd. Flow (perm)		3539	1583	3433	3539					1610	3084			
Volume (vph)	0	872	381	89	523	0	0	0	0	328	324	489		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Adj. Flow (vph)	0	918	401	94	551	0	0	0	0	345	341	515		
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	213	0		
Lane Group Flow (vph)	0	918	258	94	551	0	0	0	0	345	643	0		
Turn Type		Perm		Prot						Perm				
Protected Phases		4		3		8				6				
Permitted Phases		4						6						
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5			
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0			
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32			
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5			
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0			
Lane Grp Cap (vph)		1641	734	210	2035					523	1002			
v/s Ratio Prot		c0.26		c0.03		0.16								
v/s Ratio Perm				0.16						c0.21	0.21			
v/c Ratio		0.56	0.35	0.45	0.27					0.66	0.64			
Uniform Delay, d1		15.5	13.7	36.2	8.6					23.2	23.0			
Progression Factor		1.20	1.90	1.01	0.90					1.00	1.00			
Incremental Delay, d2		0.1	0.1	1.4	0.3					6.4	3.2			
Delay (s)		18.8	26.2	38.0	8.0					29.6	26.2			
Level of Service		B	C	D	A					C	C			
Approach Delay (s)		21.1		12.4		0.0		27.2						
Approach LOS		C		B		A		C						
Intersection Summary														
HCM Average Control Delay		21.6		HCM Level of Service		C								
HCM Volume to Capacity ratio		0.59												
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		12.0								
Intersection Capacity Utilization		60.2%		ICU Level of Service		B								
Analysis Period (min)		15												
c Critical Lane Group														

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3409		1681	1734	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3409		1681	1734	2787	1770	1814	
Volume (vph)	0	604	595	413	360	117	253	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	636	626	435	379	123	266	114	599	44	43	9
RTOR Reduction (vph)	0	0	485	0	32	0	0	0	475	0	7	0
Lane Group Flow (vph)	0	636	141	435	470	0	185	195	124	44	45	0
Turn Type	Prot		Perm		Prot		Split		Perm		Split	
Protected Phases	7		4		3		8		2		2	
Permitted Phases			4						2		6	
Actuated Green, G (s)	17.5		17.5		12.5		34.5		16.0		16.0	
Effective Green, g (s)	18.0		18.0		13.0		35.0		16.5		16.5	
Actuated g/C Ratio	0.22		0.22		0.16		0.44		0.21		0.21	
Clearance Time (s)	4.5		4.5		4.5		4.5		4.5		4.5	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	1144		356		558		1491		347		358	
v/s Ratio Prot	c0.13				c0.13		0.14		0.11		c0.11	
v/s Ratio Perm			0.09								0.04	
v/c Ratio	0.56		0.40		0.78		0.32		0.53		0.54	
Uniform Delay, d1	27.5		26.4		32.1		14.7		28.3		28.4	
Progression Factor	1.48		9.48		1.18		1.22		0.87		0.87	
Incremental Delay, d2	1.6		2.7		6.3		0.5		5.3		5.4	
Delay (s)	42.2		252.7		44.1		18.4		30.0		30.1	
Level of Service	D		F		D		B		C		C	
Approach Delay (s)	146.6				30.3				37.2		22.6	
Approach LOS	F				C				D		C	
Intersection Summary												
HCM Average Control Delay	77.0			HCM Level of Service					E			
HCM Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	62.0%			ICU Level of Service					B			
Analysis Period (min)	15											
c Critical Lane Group												






















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↖	↖↖	↖↖		↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	1016	653	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1069	687	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1069	718	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	10.0	50.5	36.0		20.5	20.5
Effective Green, g (s)	10.5	51.0	36.5		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	451	2256	1603		465	416
v/s Ratio Prot	0.06	c0.30	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.45	0.47	0.45		0.21	0.16
Uniform Delay, d1	32.1	7.5	14.9		23.0	22.7
Progression Factor	0.92	2.10	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	0.9		1.0	0.8
Delay (s)	30.2	16.4	15.8		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)		18.6	15.8		23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		18.5		HCM Level of Service		B
HCM Volume to Capacity ratio		0.40				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		40.4%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	418	3	40	8	3	5	514	489	2	7	435	600
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	440	3	42	8	3	5	541	515	2	7	458	632
RTOR Reduction (vph)	0	0	34	0	5	0	0	0	0	0	0	486
Lane Group Flow (vph)	220	223	8	0	11	0	541	517	0	7	458	146
Turn Type	Split		Perm	Split			Prot			Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	15.4	15.4	15.4		1.5		27.1	43.6		1.5	18.0	18.0
Effective Green, g (s)	15.9	15.9	15.9		2.0		27.6	44.1		2.0	18.5	18.5
Actuated g/C Ratio	0.20	0.20	0.20		0.02		0.35	0.55		0.02	0.23	0.23
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	334	335	315		44		611	1950		44	818	366
v/s Ratio Prot	0.13	c0.13			c0.01		c0.31	0.15		0.00	c0.13	
v/s Ratio Perm			0.01									0.09
v/c Ratio	0.66	0.67	0.03		0.25		0.89	0.26		0.16	0.56	0.40
Uniform Delay, d1	29.5	29.6	25.8		38.3		24.7	9.4		38.2	27.2	26.0
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.29	1.12	4.84
Incremental Delay, d2	4.6	4.9	0.0		3.0		14.4	0.3		1.1	1.8	2.1
Delay (s)	34.2	34.5	25.9		41.3		39.1	9.8		50.5	32.3	128.1
Level of Service	C	C	C		D		D	A		D	C	F
Approach Delay (s)		33.6			41.3		24.8				87.6	
Approach LOS		C			D		C				F	
Intersection Summary												
HCM Average Control Delay			52.4	HCM Level of Service					D			
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			80.0	Sum of lost time (s)					16.0			
Intersection Capacity Utilization			79.0%	ICU Level of Service					D			
Analysis Period (min)			15									
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	←	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	37	832	63	0	750
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	39	876	66	0	789
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1698	909			942	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1698	909			942	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	88			100	
cM capacity (veh/h)	101	333			728	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	39	942	789			
Volume Left	0	0	0			
Volume Right	39	66	0			
cSH	333	1700	1700			
Volume to Capacity	0.12	0.55	0.46			
Queue Length 95th (ft)	10	0	0			
Control Delay (s)	17.2	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	17.2	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		57.6%		ICU Level of Service	B	
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↖	↗	↖	↑	↓	↘
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑↑	↑↑	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6			0.0
Approach LOS	D					
Intersection Summary						
Average Delay				5.8		
Intersection Capacity Utilization		37.7%			ICU Level of Service	A
Analysis Period (min)		15				

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	↖	↗	↖	↗	↖	↗
Lane Configurations	↖	↗	↖	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	333	562	251	282	467
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	351	592	264	297	492
RTOR Reduction (vph)	0	274	0	150	0	0
Lane Group Flow (vph)	271	77	592	114	297	492
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	13.4	13.4	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.9	13.9	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	391	349	801	681	281	1215
v/s Ratio Prot	c0.15		c0.32		c0.17	0.26
v/s Ratio Perm		0.05		0.07		
v/c Ratio	0.69	0.22	0.74	0.17	1.06	0.40
Uniform Delay, d1	22.6	20.1	15.0	11.0	26.5	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.3	6.1	0.5	69.5	1.0
Delay (s)	27.8	20.4	21.0	11.5	96.0	6.2
Level of Service	C	C	C	B	F	A
Approach Delay (s)	23.7		18.1		40.0	
Approach LOS	C		B		D	
Intersection Summary						
HCM Average Control Delay		27.2		HCM Level of Service	C	
HCM Volume to Capacity ratio		0.79				
Actuated Cycle Length (s)		63.0		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		69.4%		ICU Level of Service	C	
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	670	36	202	622	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	705	38	213	655	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	119	0	63	70	0	59	0
Lane Group Flow (vph)	53	705	9	213	655	43	67	34	15	284	90	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.20		0.06	c0.19		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.85	0.02	0.83	0.71	0.10	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	29.2	23.5	36.5	26.7	22.4	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	0.84	0.55	0.24	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	8.0	0.0	15.8	1.9	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	37.2	23.6	46.5	16.5	5.3	36.8	28.5	27.7	23.4	14.2	
Level of Service	D	D	C	D	B	A	D	C	C	C	B	
Approach Delay (s)		37.6			20.9			30.4			20.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			27.0		HCM Level of Service	C						
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	16.0						
Intersection Capacity Utilization			56.7%		ICU Level of Service	B						
Analysis Period (min)			15									
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰	↰	↰↰	↰↰	↰	↰	↰↰	↰	↰↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	771	146	371	703	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	812	154	391	740	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	255	0	117	227	0	0	206
Lane Group Flow (vph)	245	812	51	391	740	122	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.16		0.11	c0.21		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.88	0.48	0.10	0.76	0.65	0.24	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.3	18.5	32.6	23.1	19.8	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.81	0.50	0.37	0.78	0.69	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.1	0.7	0.3	5.3	2.3	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	45.8	11.4	7.0	30.7	18.2	20.1	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	B	C	D	C	C	D	D	C
Approach Delay (s)		17.8			21.9			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.7			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		67.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰	↰	↰	↰↰	↰	↰	↰↰	↰	↰↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.97		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4938		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4938		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1254	301	68	1071	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1320	317	72	1127	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	47	0	0	0	0	0	12	0	0	0	44
Lane Group Flow (vph)	0	1590	0	72	1127	209	0	13	0	370	370	325
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases						Free	2					6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2216		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.32		0.04	c0.32							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.21
v/c Ratio		0.72		0.62	0.56	0.13		0.03		0.84	0.88	0.61
Uniform Delay, d1		17.9		36.4	11.1	0.0		17.8		24.6	25.1	22.3
Progression Factor		0.41		1.15	0.82	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.7		8.2	1.0	0.2		0.0		13.7	18.9	2.1
Delay (s)		9.1		50.0	10.2	0.2		17.9		38.4	44.0	24.4
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.1			10.7			17.9			35.6	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.7			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		70.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												





















20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	
Flt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.82	
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1486	
Volume (vph)	17	1677	273	0	1001	350	334	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1765	287	0	1054	368	352	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1765	287	0	1054	368	352	160	160	0	16	0
Turn Type	Prot	Free			Free	Perm		Perm	Perm			
Protected Phases	7	4			8			2			6	
Permitted Phases		Free			Free	2		2		6		
Actuated Green, G (s)	2.2	46.9	80.0		40.2	80.0	24.1	24.1	24.1		24.1	
Effective Green, g (s)	2.7	47.4	80.0		40.7	80.0	24.6	24.6	24.6		24.6	
Actuated g/C Ratio	0.03	0.59	1.00		0.51	1.00	0.31	0.31	0.31		0.31	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3797	1583		2587	1583	427	462	462		457	
v/s Ratio Prot	0.01	c0.28			0.21			0.11				
v/s Ratio Perm			0.18			0.23	c0.25		0.11		0.01	
v/c Ratio	0.30	0.46	0.18		0.41	0.23	0.82	0.35	0.35		0.03	
Uniform Delay, d1	37.7	9.2	0.0		12.2	0.0	25.7	21.5	21.5		19.4	
Progression Factor	1.07	1.10	1.00		0.62	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.8	0.3	0.2		0.4	0.3	12.2	0.5	0.5		0.0	
Delay (s)	42.2	10.3	0.2		7.9	0.3	37.9	21.9	21.9		19.4	
Level of Service	D	B	A		A	A	D	C	C		B	
Approach Delay (s)		9.2			5.9			30.3			19.4	
Approach LOS		A			A			C			B	
Intersection Summary												
HCM Average Control Delay		11.5			HCM Level of Service				B			
HCM Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)				8.0			
Intersection Capacity Utilization		51.8%			ICU Level of Service				A			
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Flt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	4950		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	4950		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1184	545	141	787	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1246	574	148	828	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	38	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1246	179	148	969	0	226	475	47	107	242	29
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1589	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.25		0.08	c0.20		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	0.78	0.36	0.60	0.68		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	25.0	21.3	32.4	25.2		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.70	0.68	2.63	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	3.6	1.9	4.1	2.6		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	22.1	20.6	57.9	36.5	27.8		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	C	C	E	D	C		D	C	C	C	C	C
Approach Delay (s)		31.0			28.9			32.7			31.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		30.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		63.0%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	119	321	494	108	142	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	125	338	520	114	149	360	231
RTOR Reduction (vph)	0	67	0	0	96	0	0	75	0	0	174	
Lane Group Flow (vph)	140	655	0	135	620	29	338	520	39	149	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.08	0.19	
v/s Ratio Perm					0.02			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.08	0.94	0.81	0.07	0.83	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	20.7	27.3	20.5	15.2	30.6	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.1	33.1	10.4	0.3	26.8	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	20.7	60.4	30.9	15.4	57.4	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	E	D	C
Approach Delay (s)		39.7			33.8			39.4			36.4	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM Average Control Delay		37.4			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		69.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak













	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3515		1770	3539	1583	1770	1660	1660	1770	1649	1649
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3515		1770	3539	1583	1770	1660	1660	1770	1649	1649
Volume (vph)	102	671	32	53	754	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	706	34	56	794	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	0	135	0	61	0	0	60	0
Lane Group Flow (vph)	107	737	0	56	794	216	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8							6
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.21		0.03	c0.22		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.14							
v/c Ratio	0.67	0.65		0.58	0.79	0.48	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.3		41.6	29.7	26.7	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.68	0.59	0.22	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.0		8.0	5.7	3.3	22.4	1.0		5.7	0.1	
Delay (s)	50.4	29.3		36.2	23.4	9.2	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		32.0			19.8			49.1			27.8	
Approach LOS		C			B			D			C	
Intersection Summary												
HCM Average Control Delay		26.7			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		71.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps

2008 + Alternative E

Graton Rancheria Casino & Hotel

PM Peak






												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↱	↑↑					↱↱	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	407	99	916	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	428	104	964	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	0	0	85	0
Lane Group Flow (vph)	0	862	321	104	964	0	0	0	0	673	138	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06		c0.27				c0.20	0.09	
v/s Ratio Perm		0.20										
v/c Ratio		0.59	0.49	0.44	0.46					0.61	0.27	
Uniform Delay, d1		20.7	19.6	35.8	10.5					25.7	22.6	
Progression Factor		0.54	0.48	1.25	1.65					1.00	1.00	
Incremental Delay, d2		1.3	2.0	1.2	0.7					1.0	1.3	
Delay (s)		12.5	11.5	46.0	18.0					26.7	23.9	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		12.1		20.7		0.0				26.0		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		18.8		HCM Level of Service		B						
HCM Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		61.7%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps

2008 + Alternative E

Graton Rancheria Casino & Hotel

PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	367	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	386	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	386	227
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	63.1			63.1	17.9	17.9
Effective Green, g (s)	63.6			63.6	18.4	18.4
Actuated g/C Ratio	0.71			0.71	0.20	0.20
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2501			2501	702	324
v/s Ratio Prot	c0.43			0.18	0.11	
v/s Ratio Perm						c0.14
v/c Ratio	0.61			0.26	0.55	0.70
Uniform Delay, d1	6.8			4.7	32.1	33.3
Progression Factor	0.32			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	0.9	6.7
Delay (s)	3.1			5.0	33.0	40.0
Level of Service	A			A	C	D
Approach Delay (s)	3.1			5.0	35.7	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			10.9	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			61.7%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	6	11	2	7	199	19	734	20	116	554	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	6	12	2	7	209	20	773	21	122	583	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1364	1663	294	1363	1644	386	587			794		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1364	1663	294	1363	1644	386	587			794		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	92	98	98	91	66	98			85		
cM capacity (veh/h)	57	80	703	86	82	612	984			823		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	219	20	386	386	21	122	389	199			
Volume Left	7	2	20	0	0	0	122	0	0			
Volume Right	12	209	0	0	0	21	0	0	4			
cSH	112	640	984	1700	1700	1700	823	1700	1700			
Volume to Capacity	0.22	0.34	0.02	0.23	0.23	0.01	0.15	0.23	0.12			
Queue Length 95th (ft)	20	38	2	0	0	0	13	0	0			
Control Delay (s)	46.0	15.6	8.7	0.0	0.0	0.0	10.1	0.0	0.0			
Lane LOS	E	C	A				B					
Approach Delay (s)	46.0	15.6	0.2				1.7					
Approach LOS	E	C										
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			45.9%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	5	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	5	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	6	1								
Volume Left	1	4	5	0								
Volume Right	3	2	1	0								
cSH	1359	1432	621	557								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.1	0.2	10.9	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.9	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			24.4%			ICU Level of Service			A			
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		27.4%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		32.1%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	→	↗	←	↖	↖	↑	↗	↘	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	844	191	312	568	215	163	279	475	245
v/c Ratio	1.55	0.34	0.52	0.62	0.97	0.56	0.72	0.77	0.95
Control Delay	291.4	38.0	42.3	8.7	122.0	77.8	18.3	69.1	104.6
Queue Delay	95.5	5.0	27.7	1.3	0.0	0.0	1.0	18.8	0.0
Total Delay	386.9	43.0	70.1	10.1	122.0	77.8	19.2	87.9	104.6
Queue Length 50th (ft)	~1240	152	270	87	228	87	0	246	240
Queue Length 95th (ft)	#1503	210	354	146	#402	127	95	#351	#422
Internal Link Dist (ft)	550		220			110			270
Turn Bay Length (ft)					150		100	275	
Base Capacity (vph)	546	567	597	911	221	376	418	619	257
Starvation Cap Reductn	0	307	286	167	0	0	0	0	0
Spillback Cap Reductn	66	0	0	0	0	0	31	142	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.76	0.73	1.00	0.76	0.97	0.43	0.72	1.00	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↖	→	↘	↖	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	163	5	32	218
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.55	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	29.0	25.5	34.5	5.3	4.6	35.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	29.0	25.5	34.5	5.3	4.6	35.8	11.8
Queue Length 50th (ft)	2	15	0	2	20	87	6	0	15	24
Queue Length 95th (ft)	13	39	49	m6	72	m111	m34	m1	40	64
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	400	2462	1102	184	1875
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	918	401	94	551	345	856
v/c Ratio	0.55	0.45	0.37	0.27	0.66	0.70
Control Delay	18.7	9.0	39.4	8.0	30.4	18.2
Queue Delay	8.3	1.8	0.0	0.0	0.0	0.8
Total Delay	27.0	10.8	39.4	8.1	30.4	18.9
Queue Length 50th (ft)	237	137	21	38	161	127
Queue Length 95th (ft)	m236	m117	38	61	261	197
Internal Link Dist (ft)	220		466		348	
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1215
Starvation Cap Reductn	722	325	0	0	0	0
Spillback Cap Reductn	0	0	0	86	0	128
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.71	0.37	0.28	0.66	0.79
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	636	626	435	502	185	195	599	44	52
v/c Ratio	0.56	0.74	0.78	0.33	0.53	0.54	0.57	0.12	0.14
Control Delay	42.4	22.9	48.2	16.5	30.6	30.7	6.3	23.1	19.0
Queue Delay	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	25.2	48.2	16.5	30.6	30.7	6.3	23.1	19.0
Queue Length 50th (ft)	160	188	120	111	60	63	0	22	23
Queue Length 95th (ft)	182	267	#180	148	m124	m129	78	41	43
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	841	558	1523	347	358	1050	365	381
Starvation Cap Reductn	0	110	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.86	0.78	0.33	0.53	0.54	0.57	0.12	0.14
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1069	722	97	248
v/c Ratio	0.46	0.47	0.45	0.21	0.41
Control Delay	32.1	16.6	16.2	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	32.1	17.2	16.2	24.5	5.8
Queue Length 50th (ft)	64	256	123	38	0
Queue Length 95th (ft)	87	275	180	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1609	465	598
Starvation Cap Reductn	0	740	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.71	0.45	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	220	223	42	16	541	517	7	458	632
v/c Ratio	0.66	0.67	0.12	0.11	1.02	0.23	0.05	0.40	0.67
Control Delay	38.7	39.0	8.8	29.3	74.3	9.2	43.4	27.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	38.7	39.0	8.8	29.3	74.3	9.2	43.4	27.1	12.3
Queue Length 50th (ft)	107	109	0	5	~278	39	4	126	151
Queue Length 95th (ft)	168	170	23	23	#478	147	m5	#224	166
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2270	177	1140	938
Starvation Cap Reductn	0	0	0	0	0	0	0	0	67
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.50	0.09	0.09	1.02	0.23	0.04	0.40	0.73
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	351	592	264	297	492
v/c Ratio	0.69	0.56	0.74	0.32	1.06	0.40
Control Delay	32.6	6.7	22.9	3.1	100.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	6.7	22.9	3.1	100.8	6.8
Queue Length 50th (ft)	96	0	193	0	~136	84
Queue Length 95th (ft)	168	57	#351	38	#272	136
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	654	800	830	281	1215
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.54	0.74	0.32	1.06	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	705	38	213	655	162	67	97	85	284	149
v/c Ratio	0.40	0.94	0.10	0.83	0.71	0.30	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	53.3	9.9	54.2	20.4	2.3	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	53.3	9.9	54.2	20.4	2.3	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	183	0	38	131	0	16	8	0	118	13
Queue Length 95th (ft)	61	#290	23 m#104	#244	m4	36	48	36	193	45	
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	535	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.94	0.10	0.83	0.71	0.30	0.26	0.25	0.22	0.53	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	812	154	391	740	377	144	435	274	383	278	256
v/c Ratio	0.88	0.48	0.25	0.76	0.65	0.49	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	52.0	11.6	2.0	34.8	18.7	4.4	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	11.6	2.0	34.8	18.7	4.4	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	76	57	3	107	182	35	71	74	0	95	129	0
Queue Length 95th (ft) m#133	m63	m6	#167	213	47	#157	118	65	#188	#230	58	
Internal Link Dist (ft)	320			520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1145	767	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.48	0.25	0.76	0.65	0.49	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1637	72	1127	209	25	370	370	369
v/c Ratio	0.71	0.51	0.56	0.13	0.05	0.84	0.88	0.64
Control Delay	8.9	53.0	10.8	0.2	9.8	43.2	48.5	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	53.0	10.8	0.2	9.8	43.2	48.5	23.6
Queue Length 50th (ft)	134	34	176	0	2	169	172	120
Queue Length 95th (ft)	171	m71	99	m0	18	#318	#329	209
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2319	142	2000	1583	568	475	455	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.51	0.56	0.13	0.04	0.78	0.81	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1765	287	1054	368	352	161	161	18
v/c Ratio	0.14	0.46	0.18	0.38	0.23	0.82	0.35	0.35	0.04
Control Delay	38.9	11.8	0.2	8.5	0.3	40.8	21.5	21.5	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	11.8	0.2	8.5	0.3	40.8	21.5	21.5	13.6
Queue Length 50th (ft)	10	175	0	75	0	162	65	65	5
Queue Length 95th (ft)	m13	m246	m0	128	m0	210	92	92	16
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3797	1583	2759	1583	730	790	790	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46	0.18	0.38	0.23	0.48	0.20	0.20	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1246	574	148	1007	226	475	236	107	242	193
v/c Ratio	0.51	0.78	0.64	0.60	0.69	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	24.7	21.7	9.8	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	21.7	10.3	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	70	227	142	69	155	114	120	0	54	62	0
Queue Length 95th (ft)	87	#218	313	#187	#253	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1592	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	85	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.78	0.71	0.60	0.69	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↗	→	↖	←	↗	↖	↑	↗	↖	↓	↘
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	125	338	520	114	149	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.27	0.95	0.81	0.18	0.83	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.4	66.8	32.8	4.5	69.5	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.4	66.8	32.8	4.5	69.5	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	64	146	0
Queue Length 95th (ft)	#162	#221	#155	184	37	#296	#358	30	#161	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	479	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.26	0.95	0.81	0.18	0.83	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	↗	→	↖	←	↗	↖	↑	↗	↖	↓	↘
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	107	740	56	794	351	51	91	511	132		
v/c Ratio	0.67	0.60	0.47	0.74	0.57	0.43	0.44	0.80	0.18		
Control Delay	64.2	29.8	39.9	23.0	6.5	52.2	21.8	35.9	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.2	29.8	39.9	23.0	6.5	52.2	21.8	35.9	5.8		
Queue Length 50th (ft)	61	203	33	237	4	28	14	237	10		
Queue Length 95th (ft)	#161	#285	#69	#336	18	65	57	#388	43		
Internal Link Dist (ft)		6630		350			200		236		
Turn Bay Length (ft)	225		150		80	50		225			
Base Capacity (vph)	159	1232	118	1077	613	118	367	653	782		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.67	0.60	0.47	0.74	0.57	0.43	0.25	0.78	0.17		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	428	104	964	673	223
v/c Ratio	0.58	0.56	0.39	0.46	0.61	0.37
Control Delay	12.9	8.1	46.8	18.2	28.6	12.4
Queue Delay	0.2	0.3	0.0	0.3	0.0	0.0
Total Delay	13.1	8.4	46.8	18.5	28.6	12.4
Queue Length 50th (ft)	124	65	57	223	164	40
Queue Length 95th (ft)	154	m101	m108	280	222	98
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	770	295	2084	1106	595
Starvation Cap Reductn	139	66	0	492	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.61	0.35	0.61	0.61	0.37
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	386	248
v/c Ratio	0.61	0.26	0.55	0.72
Control Delay	3.5	5.8	34.2	41.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.5	5.8	34.2	41.1
Queue Length 50th (ft)	0	58	102	119
Queue Length 95th (ft)	243	112	129	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2502	2502	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.32	0.43
Intersection Summary				

**CUMULATIVE 2020 + ALTERNATIVE E
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	16	259	22	134	14	714	74	118	508	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	14	17	273	23	141	15	752	78	124	535	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1648	1644	536	1627	1606	791	538			829		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1648	1644	536	1627	1606	791	538			829		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	84	97	0	74	64	99			85		
cM capacity (veh/h)	35	83	544	61	88	390	1030			802		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	437	15	829	124	538						
Volume Left	0	273	15	0	124	0						
Volume Right	17	141	0	78	0	3						
cSH	156	85	1030	1700	802	1700						
Volume to Capacity	0.20	5.12	0.01	0.49	0.15	0.32						
Queue Length 95th (ft)	17	Err	1	0	14	0						
Control Delay (s)	33.6	Err	8.5	0.0	10.3	0.0						
Lane LOS	D	F	A		B							
Approach Delay (s)	33.6	9999.0	0.1		1.9							
Approach LOS	D	F										
Intersection Summary												
Average Delay		2214.3										
Intersection Capacity Utilization		80.8%		ICU Level of Service		D						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	170	26	88	280	9	126	19	312	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	179	27	93	295	9	133	20	328	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			206			714	703	193	1037	712	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			206			714	703	193	1037	712	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			58	94	61	91	97	99
cM capacity (veh/h)	1257			1365			314	334	849	116	331	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	217	397	481	32								
Volume Left	11	93	133	11								
Volume Right	27	9	328	11								
cSH	1257	1365	553	230								
Volume to Capacity	0.01	0.07	0.87	0.14								
Queue Length 95th (ft)	1	5	241	12								
Control Delay (s)	0.5	2.3	40.5	23.1								
Lane LOS	A	A	E	C								
Approach Delay (s)	0.5	2.3	40.5	23.1								
Approach LOS			E	C								
Intersection Summary												
Average Delay		18.8										
Intersection Capacity Utilization		74.8%		ICU Level of Service		D						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	472	10	9	359	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	497	11	9	378	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	387			507			941	929	502	941	930	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	387			507			941	929	502	941	930	383
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	96	98	95	96	98
cM capacity (veh/h)	1171			1057			229	263	569	229	262	665
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	518	397	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	1171	1057	302	310								
Volume to Capacity	0.01	0.01	0.10	0.10								
Queue Length 95th (ft)	1	1	9	8								
Control Delay (s)	0.3	0.3	18.3	17.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.3	18.3	17.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay		1.4										
Intersection Capacity Utilization		40.2%			ICU Level of Service		A					
Analysis Period (min)		15										



















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	472	10	9	359	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	497	11	9	378	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	387			507			936	929	502	936	925	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	387			507			936	929	502	936	925	378
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	96	98	95	96	98
cM capacity (veh/h)	1171			1057			231	263	569	230	264	669
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	518	9	378	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	1171	1057	1700	1700	303	312						
Volume to Capacity	0.01	0.01	0.22	0.01	0.10	0.10						
Queue Length 95th (ft)	1	1	0	0	9	8						
Control Delay (s)	0.3	8.4	0.0	0.0	18.2	17.8						
Lane LOS	A	A			C	C						
Approach Delay (s)	0.3	0.2			18.2	17.8						
Approach LOS					C	C						
Intersection Summary												
Average Delay		1.4										
Intersection Capacity Utilization		43.5%			ICU Level of Service		A					
Analysis Period (min)		15										



















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	40	411	41	188	324	189	44	14	396	180	31	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	433	43	198	341	199	46	15	417	189	33	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	540			476			1133	1474	238	1561	1396	270
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	540			476			1133	1474	238	1561	1396	270
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			82			54	85	45	0	70	98
cM capacity (veh/h)	1025			1083			101	98	763	26	110	728
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	42	288	187	198	227	313	478	234				
Volume Left	42	0	0	198	0	0	46	189				
Volume Right	0	0	43	0	0	199	417	12				
cSH	1025	1700	1700	1083	1700	1700	413	30				
Volume to Capacity	0.04	0.17	0.11	0.18	0.13	0.18	1.16	7.74				
Queue Length 95th (ft)	3	0	0	17	0	0	451	Err				
Control Delay (s)	8.7	0.0	0.0	9.1	0.0	0.0	124.9	Err				
Lane LOS	A			A			F	F				
Approach Delay (s)	0.7			2.4			124.9	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay			1219.1									
Intersection Capacity Utilization			76.3%		ICU Level of Service				D			
Analysis Period (min)			15									

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control	Free			Free				Stop			Stop		
Grade	0%				0%			0%			0%		
Volume (veh/h)	53	661	273	509	439	273	143	105	559	217	41	119	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	56	696	287	536	462	287	151	111	588	228	43	125	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								None					None
Median storage veh													
Upstream signal (ft)	630												
pX, platoon unblocked													
vC, conflicting volume	749			983				2401	2772	492	2781	2772	375
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	749			983				2401	2772	492	2781	2772	375
tC, single (s)	4.1			4.1				7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			23				0	0	0	0	0	80
cM capacity (veh/h)	855			698				0	4	523	0	4	623
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1					
Volume Total	56	464	519	536	308	441	849	397					
Volume Left	56	0	0	536	0	0	151	228					
Volume Right	0	0	287	0	0	287	588	125					
cSH	855	1700	1700	698	1700	1700	0	0					
Volume to Capacity	0.07	0.27	0.31	0.77	0.18	0.26	Err	Err					
Queue Length 95th (ft)	5	0	0	182	0	0	Err	Err					
Control Delay (s)	9.5	0.0	0.0	25.1	0.0	0.0	Err	Err					
Lane LOS	A			D				F	F				
Approach Delay (s)	0.5			10.4				Err	Err				
Approach LOS							F	F					
Intersection Summary													
Average Delay			Err										
Intersection Capacity Utilization	120.6%		ICU Level of Service		H								
Analysis Period (min)	15												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1650	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1650	
Volume (vph)	151	1031	255	73	441	730	556	103	350	453	70	224
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1085	268	77	464	768	585	108	368	477	74	236
RTOR Reduction (vph)	0	0	71	0	0	409	0	0	342	0	72	0
Lane Group Flow (vph)	159	1085	197	77	464	359	585	108	26	477	238	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	
Protected Phases	4	4		8	8	5	2		1	6		
Permitted Phases		4			8		2					
Actuated Green, G (s)	47.5	47.5	47.5	53.5	53.5	53.5	19.5	10.9	10.9	30.1	21.5	
Effective Green, g (s)	48.0	48.0	48.0	54.0	54.0	54.0	20.0	11.4	11.4	30.6	22.0	
Actuated g/C Ratio	0.30	0.30	0.30	0.34	0.34	0.34	0.12	0.07	0.07	0.19	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	531	1017	432	567	597	534	221	252	113	657	227	
v/s Ratio Prot	0.09	c0.32		0.05	c0.26		c0.33	0.03		0.14	c0.14	
v/s Ratio Perm			0.14			0.23		0.02				
v/c Ratio	0.30	1.07	0.46	0.14	0.78	0.67	2.65	0.43	0.23	0.73	1.05	
Uniform Delay, d1	43.1	56.0	45.4	36.8	47.6	45.4	70.0	71.2	70.2	60.8	69.0	
Progression Factor	1.00	1.00	1.00	0.86	0.88	1.31	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	47.8	0.8	0.4	8.3	5.7	754.0	1.2	1.1	4.0	73.6	
Delay (s)	43.4	103.8	46.2	32.2	50.0	65.2	824.0	72.4	71.2	64.8	142.6	
Level of Service	D	F	D	C	D	E	F	E	E	E	F	
Approach Delay (s)		87.3			57.9		486.4				95.4	
Approach LOS		F			E		F				F	
Intersection Summary												
HCM Average Control Delay		171.1										
HCM Volume to Capacity ratio		1.17										
Actuated Cycle Length (s)		160.0										
Intersection Capacity Utilization		116.0%										
Analysis Period (min)		15										
c Critical Lane Group												































9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3065	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3065	
Volume (vph)	0	1392	445	77	729	0	0	0	0	355	288	512
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1465	468	81	767	0	0	0	0	374	303	539
RTOR Reduction (vph)	0	0	169	0	0	0	0	0	0	0	128	0
Lane Group Flow (vph)	0	1465	299	81	767	0	0	0	0	374	714	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases		4										
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	996	
v/s Ratio Prot		c0.41		0.02	c0.22							
v/s Ratio Perm			0.19							0.23	0.23	
v/c Ratio		0.89	0.41	0.39	0.38					0.72	0.87dr	
Uniform Delay, d1		19.6	14.2	36.1	9.2					23.7	23.8	
Progression Factor		1.45	1.85	1.04	0.94					1.00	1.00	
Incremental Delay, d2		3.1	0.6	1.1	0.5					8.1	4.4	
Delay (s)		31.6	26.8	38.5	9.1					31.9	28.2	
Level of Service		C	C	D	A					C	C	
Approach Delay (s)		30.4			12.0				0.0		29.3	
Approach LOS		C			B				A		C	
Intersection Summary												
HCM Average Control Delay		26.2								C		
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		80.0								8.0		
Intersection Capacity Utilization		68.3%								C		
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

















10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		 	 				  		 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3520		1681	1693	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3520		1681	1693	2787	1770	1723	
Volume (vph)	0	805	942	499	459	17	350	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	847	992	525	483	18	368	19	601	9	9	9
RTOR Reduction (vph)	0	0	594	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	847	398	525	498	0	189	198	124	9	11	0
Turn Type	Prot	Perm		Prot			Split	Perm		Split		
Protected Phases	7	4	3		8	2		2	6		6	
Permitted Phases	4			2								
Actuated Green, G (s)	17.5	17.5	12.5	34.5	16.0			16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0	16.5			16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44	0.21			0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1540	347			349	575	365	355	
v/s Ratio Prot	0.17		c0.15	0.14	0.11			c0.12		0.01	c0.01	
v/s Ratio Perm		c0.25	0.04									
v/c Ratio	0.74	1.12	0.94	0.32	0.54			0.57	0.22	0.02	0.03	
Uniform Delay, d1	28.8	31.0	33.1	14.7	28.4			28.5	26.4	25.3	25.4	
Progression Factor	1.46	4.56	1.22	1.25	0.90			0.90	1.51	1.00	1.00	
Incremental Delay, d2	2.3	71.0	21.6	0.5	5.4			5.8	0.8	0.1	0.2	
Delay (s)	44.3	212.4	62.1	18.9	31.0			31.5	40.6	25.5	25.5	
Level of Service	D	F	E	B	C			C	D	C	C	
Approach Delay (s)	135.0			41.0	37.0					25.5		
Approach LOS	F			D	D					C		
Intersection Summary												
HCM Average Control Delay	84.4			HCM Level of Service						F		
HCM Volume to Capacity ratio	0.66											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	85.9%			ICU Level of Service						E		
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	 	 	 		 	 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1251	871	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1317	917	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	80
Lane Group Flow (vph)	144	1317	979	0	107	28
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	8.6	50.5	37.4	20.5		20.5
Effective Green, g (s)	9.1	51.0	37.9	21.0		21.0
Actuated g/C Ratio	0.11	0.64	0.47	0.26		0.26
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	391	2256	1660	465		416
v/s Ratio Prot	0.04	c0.37	0.28	c0.06		
v/s Ratio Perm				0.02		
v/c Ratio	0.37	0.58	0.59	0.23		0.07
Uniform Delay, d1	32.8	8.4	15.4	23.2		22.2
Progression Factor	0.81	2.24	1.00	1.00		1.00
Incremental Delay, d2	0.4	0.8	1.5	1.2		0.3
Delay (s)	27.1	19.5	16.9	24.3		22.5
Level of Service	C	B	B	C		C
Approach Delay (s)	20.3		16.9	23.4		
Approach LOS	C		B	C		
Intersection Summary						
HCM Average Control Delay	19.3			HCM Level of Service		B
HCM Volume to Capacity ratio	0.48					
Actuated Cycle Length (s)	80.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	46.9%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	504	3	47	8	3	5	552	413	2	7	616	820
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	531	3	49	8	3	5	581	435	2	7	648	863
RTOR Reduction (vph)	0	0	38	0	5	0	0	0	0	0	0	532
Lane Group Flow (vph)	266	268	11	0	11	0	581	437	0	7	648	331
Turn Type	Split	Perm	Split		Prot		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	16.8	16.8	16.8		1.5		27.1	42.2		1.5	16.6	16.6
Effective Green, g (s)	17.3	17.3	17.3		2.0		27.6	42.7		2.0	17.1	17.1
Actuated g/C Ratio	0.22	0.22	0.22		0.02		0.35	0.53		0.02	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	364	365	342		44		611	1888		44	756	338
v/s Ratio Prot	0.16	c0.16			c0.01		c0.33	0.12		0.00	0.18	
v/s Ratio Perm			0.01									c0.21
v/c Ratio	0.73	0.73	0.03		0.25		0.95	0.23		0.16	0.86	0.98
Uniform Delay, d1	29.2	29.2	24.7		38.3		25.5	9.9		38.2	30.3	31.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.21	1.16	2.42
Incremental Delay, d2	7.4	7.5	0.0		3.0		24.8	0.3		0.2	1.3	10.5
Delay (s)	36.5	36.7	24.8		41.3		50.3	10.2		46.4	36.3	86.0
Level of Service	D	D	C		D		D	B		D	D	F
Approach Delay (s)		35.6			41.3		33.1				64.6	
Approach LOS		D			D		C				E	
Intersection Summary												
HCM Average Control Delay		48.9										
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		94.7%										
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	37	765	63	0	780
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	39	805	66	0	821
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1659	838			872	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1659	838			872	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	107	366			774	
Direction, Lane #						
Volume Total	39	872	821			
Volume Left	0	0	0			
Volume Right	39	66	0			
cSH	366	1700	1700			
Volume to Capacity	0.11	0.51	0.48			
Queue Length 95th (ft)	9	0	0			
Control Delay (s)	16.0	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	16.0	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		54.1%			ICU Level of Service	A
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↱	↱
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	144	31	12	359	363	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	152	33	13	378	382	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609	204	408			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609	204	408			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	96	99			
cM capacity (veh/h)	422	803	1147			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	152	33	13	189	189	255 154
Volume Left	152	0	13	0	0	0 0
Volume Right	0	33	0	0	0	0 26
cSH	422	803	1147	1700	1700	1700 1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15 0.09
Queue Length 95th (ft)	40	3	1	0	0	0 0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	16.7		0.3			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			25.5%		ICU Level of Service	A
Analysis Period (min)			15			

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	264	563	253	275	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	278	593	266	289	533
RTOR Reduction (vph)	0	217	0	151	0	0
Lane Group Flow (vph)	266	61	593	115	289	533
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1 6	
Permitted Phases	8		2			
Actuated Green, G (s)	13.2	13.2	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.7	13.7	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	345	804	683	282	1219
v/s Ratio Prot	c0.15		c0.32		c0.16	
v/s Ratio Perm	0.04		0.07			
v/c Ratio	0.69	0.18	0.74	0.17	1.02	0.44
Uniform Delay, d1	22.6	20.0	14.9	10.9	26.4	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	0.2	6.0	0.5	60.1	1.1
Delay (s)	27.7	20.2	20.9	11.5	86.5	6.4
Level of Service	C	C	C	B	F	A
Approach Delay (s)	23.8		18.0			34.6
Approach LOS	C		B			C
Intersection Summary						
HCM Average Control Delay		25.5		HCM Level of Service		C
HCM Volume to Capacity ratio		0.78				
Actuated Cycle Length (s)		62.8		Sum of lost time (s)		12.0
Intersection Capacity Utilization		68.9%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	655	53	116	539	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	689	56	122	567	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	44	0	0	76	0	57	70	0	55	0
Lane Group Flow (vph)	87	689	12	122	567	21	73	42	19	296	89	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.5	16.7	16.7	4.4	16.6	16.6	4.4	16.5	16.5	24.4	36.5	
Effective Green, g (s)	5.0	17.2	17.2	4.9	17.1	17.1	4.9	17.0	17.0	24.9	37.0	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.21	0.21	0.31	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	111	761	340	210	756	338	210	335	320	551	770	
v/s Ratio Prot	0.05	c0.19		0.04	c0.16		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.78	0.91	0.04	0.58	0.75	0.06	0.35	0.13	0.06	0.54	0.12	
Uniform Delay, d1	37.0	30.6	24.8	36.6	29.4	25.1	36.0	25.5	25.1	22.8	12.2	
Progression Factor	1.00	1.00	1.00	0.82	0.56	0.29	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	29.4	14.2	0.0	3.2	3.3	0.1	1.0	0.8	0.4	1.0	0.3	
Delay (s)	66.4	44.9	24.9	33.2	19.7	7.3	37.0	26.3	25.5	23.8	12.5	
Level of Service	E	D	C	C	B	A	D	C	C	C	B	
Approach Delay (s)		45.8			20.3			29.0			20.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay		30.4			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		54.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Volume (vph)	216	770	163	377	650	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	811	172	397	684	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	70	264	0	0	198
Lane Group Flow (vph)	227	811	57	397	684	108	182	443	103	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.16		c0.12	c0.19		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.49	0.11	0.77	0.60	0.21	0.87	0.71	0.37	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.4	18.7	32.7	22.8	19.8	34.6	30.1	28.0	34.0	30.7	26.3
Progression Factor	0.78	0.55	0.42	0.87	0.80	1.05	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.3	0.7	0.3	5.9	2.0	0.8	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	37.7	12.5	8.2	34.2	20.2	21.5	63.7	33.9	28.8	45.1	46.1	26.5
Level of Service	D	B	A	C	C	C	E	C	C	D	D	C
Approach Delay (s)		16.6			24.4			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		28.5			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		68.7%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4914	1610	3330	1583	1610	3387	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4914	1610	3330	1583	1610	3387	1583	1583
Volume (vph)	235	1267	462	165	698	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1334	486	174	735	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	342	0	62	0	0	204	0	0	131	0
Lane Group Flow (vph)	247	1334	144	174	886	0	229	483	50	181	380	29
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Perm
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	12.6	22.6	22.6	10.0	20.0	15.4	15.4	15.4	14.0	14.0	14.0	14.0
Effective Green, g (s)	13.1	23.1	23.1	10.5	20.5	15.9	15.9	15.9	14.5	14.5	14.5	14.5
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.26	0.20	0.20	0.20	0.18	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	562	1022	457	232	1259	320	662	315	292	614	287	287
v/s Ratio Prot	0.07	c0.38	0.10	c0.18	0.14	c0.15	c0.11	0.11	0.11	0.11	0.11	0.11
v/s Ratio Perm	0.44	1.31	0.31	0.75	0.70	0.72	0.73	0.16	0.62	0.62	0.62	0.10
Uniform Delay, d1	30.1	28.4	22.3	33.5	27.0	29.9	30.0	26.5	30.2	30.2	27.3	27.3
Progression Factor	0.67	0.72	1.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	143.9	1.6	12.8	3.3	7.4	4.0	0.2	3.9	1.9	0.2	0.2
Delay (s)	20.6	164.4	40.3	46.2	30.3	37.4	34.1	26.8	34.1	32.1	27.5	27.5
Level of Service	C	F	D	D	C	D	C	C	C	C	C	C
Approach Delay (s)	118.0				32.8	32.9			31.6			
Approach LOS	F				C	C			C			
Intersection Summary												
HCM Average Control Delay	68.8				HCM Level of Service	E						
HCM Volume to Capacity ratio	0.92											
Actuated Cycle Length (s)	80.0				Sum of lost time (s)	16.0						
Intersection Capacity Utilization	80.3%				ICU Level of Service	D						
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	3390	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Volume (vph)	149	583	228	140	661	129	323	483	113	153	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	136	340	508	119	161	377	247
RTOR Reduction (vph)	0	59	0	0	103	0	0	78	0	0	181	0
Lane Group Flow (vph)	157	795	0	147	696	33	340	508	41	161	377	66
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	5.5	16.5	5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5	16.5
Effective Green, g (s)	6.0	17.0	6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24	0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	823	152	859	384	354	639	543	177	452	384	384
v/s Ratio Prot	c0.09	c0.23	0.08	0.20	c0.19	c0.27	0.09	0.20	0.20	0.20	0.20	0.20
v/s Ratio Perm	1.03	0.97	0.97	0.81	0.09	0.96	0.79	0.08	0.91	0.83	0.17	0.17
Uniform Delay, d1	32.0	26.2	31.9	25.0	20.5	27.7	20.8	15.5	31.2	25.2	20.9	20.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.0	23.1	62.4	5.8	0.1	37.3	9.9	0.3	42.2	16.4	1.0	1.0
Delay (s)	114.0	49.3	94.3	30.8	20.6	65.0	30.6	15.8	73.4	41.6	21.9	21.9
Level of Service	F	D	F	C	C	E	C	B	E	D	C	C
Approach Delay (s)	59.4			38.9		40.9			41.9			
Approach LOS	E			D		D			D			
Intersection Summary												
HCM Average Control Delay	45.6				HCM Level of Service	D						
HCM Volume to Capacity ratio	0.89											
Actuated Cycle Length (s)	70.0				Sum of lost time (s)	12.0						
Intersection Capacity Utilization	81.2%				ICU Level of Service	D						
Analysis Period (min)	15											
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3517		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3517		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	754	32	53	813	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	794	34	56	856	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	4	0	0	0	164	0	57	0	0	61	0
Lane Group Flow (vph)	128	824	0	56	856	263	51	34	0	623	84	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.5	21.8		4.4	20.7	20.7	3.3	6.4		39.4	42.5	
Effective Green, g (s)	6.0	22.3		4.9	21.2	21.2	3.8	6.9		39.9	43.0	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	871		96	834	373	75	128		785	783	
v/s Ratio Prot	0.07	c0.23		0.03	c0.24		c0.03	0.02		c0.35	c0.05	
v/s Ratio Perm						0.17						
v/c Ratio	1.08	0.95		0.58	1.03	0.71	0.68	0.26		0.79	0.11	
Uniform Delay, d1	42.0	33.3		41.6	34.4	31.5	42.5	39.2		21.5	12.9	
Progression Factor	1.00	1.00		0.67	0.60	0.24	1.00	1.00		1.00	1.00	
Incremental Delay, d2	107.4	20.0		7.7	36.1	9.5	22.4	1.1		5.5	0.1	
Delay (s)	149.4	53.2		35.6	56.7	16.9	64.9	40.3		27.1	13.0	
Level of Service	F	D		D	E	B	E	D		C	B	
Approach Delay (s)		66.1			43.1			49.1			24.4	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM Average Control Delay		45.8							D			
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		90.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		79.1%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												











24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	953	458	66	1014	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	482	69	1067	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	104	0	0	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	1003	378	69	1067	0	0	0	0	674	205	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.30					c0.20	0.13	
v/s Ratio Perm			0.24									
v/c Ratio		0.69	0.58	0.29	0.51					0.61	0.40	
Uniform Delay, d1		21.9	20.6	35.1	10.9					25.7	23.7	
Progression Factor		0.47	0.43	1.21	1.56					1.00	1.00	
Incremental Delay, d2		1.5	2.1	0.6	0.9					1.0	2.3	
Delay (s)		11.8	10.9	43.2	17.9					26.7	26.1	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		11.5			19.4			0.0			26.5	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM Average Control Delay			18.0						B			
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)		8.0				
Intersection Capacity Utilization			67.7%			ICU Level of Service		C				
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	391	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	412	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	412	273
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	60.8			60.8	20.2	20.2
Effective Green, g (s)	61.3			61.3	20.7	20.7
Actuated g/C Ratio	0.68			0.68	0.23	0.23
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2410			2410	790	364
v/s Ratio Prot	c0.47			0.20	0.12	
v/s Ratio Perm				c0.17		
v/c Ratio	0.70			0.30	0.52	0.75
Uniform Delay, d1	8.7			5.7	30.3	32.2
Progression Factor	0.35			1.00	1.00	1.00
Incremental Delay, d2	1.3			0.3	0.6	8.4
Delay (s)	4.3			6.1	30.9	40.7
Level of Service	A			A	C	D
Approach Delay (s)	4.3			6.1	34.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			11.6	HCM Level of Service		B
HCM Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			67.7%	ICU Level of Service		C
Analysis Period (min)	15					
c Critical Lane Group						














26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↗	↖	↗	↖	↗
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	5	8	23	25	228	7	765	26	132	601	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	5	8	24	26	240	7	805	27	139	633	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1465	1762	320	1425	1738	403	640			833		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1465	1762	320	1425	1738	403	640			833		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	92	99	68	63	60	99			83		
cM capacity (veh/h)	33	68	676	77	71	597	940			796		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	291	7	403	403	27	139	422	218			
Volume Left	12	24	7	0	0	0	139	0	0			
Volume Right	8	240	0	0	0	27	0	0	7			
cSH	58	423	940	1700	1700	1700	796	1700	1700			
Volume to Capacity	0.44	0.69	0.01	0.24	0.24	0.02	0.17	0.25	0.13			
Queue Length 95th (ft)	42	126	1	0	0	0	16	0	0			
Control Delay (s)	109.6	34.1	8.9	0.0	0.0	0.0	10.5	0.0	0.0			
Lane LOS	F	D	A				B					
Approach Delay (s)	109.6	34.1	0.1				1.9					
Approach LOS	F	D										
Intersection Summary												
Average Delay	7.3											
Intersection Capacity Utilization	48.6%				ICU Level of Service				A			
Analysis Period (min)	15											

















27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free											
Grade	0%											
Volume (veh/h)	1	161	5	7	265	2	10	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	11	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	13	1								
Volume Left	1	7	11	0								
Volume Right	5	2	2	0								
cSH	1281	1402	539	488								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	11.8	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.8	12.4								
Approach LOS				B	B							
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization	32.9%			ICU Level of Service					A			
Analysis Period (min)	15											

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type									None		None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			27.8%	ICU Level of Service		A						
Analysis Period (min)			15									

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↙	↘
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			193			493	493	181	521	505	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			193			493	493	181	521	505	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			75	100	97	100	100	100
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	193	275	147	0								
Volume Left	0	38	120	0								
Volume Right	24	0	27	0								
cSH	1330	1381	519	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	29	0								
Control Delay (s)	0.0	1.3	14.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.3	14.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		41.6%			ICU Level of Service				A			
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	159	1085	268	77	464	768	585	108	368	477	310
v/c Ratio	0.30	1.07	0.53	0.14	0.78	0.81	2.65	0.43	0.81	0.73	1.04
Control Delay	45.0	100.2	32.7	32.5	50.8	18.9	778.1	75.6	20.8	68.1	110.0
Queue Delay	0.0	169.8	0.0	0.0	103.7	2.9	0.0	0.0	21.3	421.4	0.0
Total Delay	45.0	270.0	32.7	32.5	154.5	21.8	778.1	75.6	42.1	489.4	110.0
Queue Length 50th (ft)	129	~686	160	52	408	193	~1028	58	0	243	~269
Queue Length 95th (ft)	196	#832	268	m80	602	284	#1271	89	110	#350	#471
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	503	567	597	944	221	376	497	656	298
Starvation Cap Reductn	0	0	0	0	217	94	0	0	0	0	0
Spillback Cap Reductn	0	271	0	0	0	0	0	0	127	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.45	0.53	0.14	1.22	0.90	2.65	0.29	0.99	1.93	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1465	468	81	767	374	842
v/c Ratio	0.87	0.51	0.32	0.38	0.72	0.87dr
Control Delay	31.0	9.4	39.6	9.3	32.9	23.3
Queue Delay	104.3	1.7	0.0	0.1	0.0	1.6
Total Delay	135.3	11.1	39.6	9.4	32.9	24.9
Queue Length 50th (ft)	497	110	18	51	179	158
Queue Length 95th (ft)	m629	m116	m38	87	#292	231
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	918	257	2035	523	1124
Starvation Cap Reductn	491	280	0	0	0	0
Spillback Cap Reductn	0	0	0	288	0	134
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.73	0.32	0.44	0.72	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	847	992	525	501	189	198	601	9	18
v/c Ratio	0.74	1.04	0.94	0.32	0.54	0.57	0.57	0.02	0.05
Control Delay	44.5	57.4	64.9	18.9	31.7	32.2	6.1	25.7	18.8
Queue Delay	0.0	71.3	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Total Delay	44.5	128.7	64.9	18.9	31.7	32.2	6.6	25.7	18.8
Queue Length 50th (ft)	181	~432	148	128	61	63	0	4	4
Queue Length 95th (ft)	187	#1098	#241	176	m117	m122	63	16	21
Internal Link Dist (ft)	466		345		380			270	
Turn Bay Length (ft)			150		150		200		
Base Capacity (vph)	1144	951	558	1544	347	349	1052	365	363
Starvation Cap Reductn	0	134	0	0	0	0	0	0	0
Spillback Cap Reductn	0	17	0	0	0	0	140	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.21	0.94	0.32	0.54	0.57	0.66	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1317	984	107	108
v/c Ratio	0.37	0.58	0.59	0.23	0.22
Control Delay	28.4	19.7	17.4	24.8	6.3
Queue Delay	0.0	2.2	0.0	0.0	0.0
Total Delay	28.4	22.0	17.4	24.8	6.3
Queue Length 50th (ft)	41	297	178	42	0
Queue Length 95th (ft)	m55	340	252	83	36
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1664	465	495
Starvation Cap Reductn	0	760	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.88	0.59	0.23	0.22
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	266	268	49	16	581	437	7	648	863
v/c Ratio	0.73	0.74	0.13	0.11	1.09	0.20	0.05	0.60	0.91
Control Delay	41.2	41.3	8.2	29.3	96.8	9.5	40.4	30.5	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5
Total Delay	41.2	41.3	8.2	29.3	96.8	9.5	40.4	30.5	20.5
Queue Length 50th (ft)	130	131	0	5	~333	35	3	164	251
Queue Length 95th (ft)	204	205	25	23	#524	124	m3	m#319	m#364
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	452	179	531	2209	177	1077	953
Starvation Cap Reductn	0	0	0	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.60	0.11	0.09	1.09	0.20	0.04	0.60	0.97
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	278	593	266	289	533
v/c Ratio	0.69	0.49	0.74	0.32	1.02	0.44
Control Delay	32.6	6.4	22.7	3.1	91.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	6.4	22.7	3.1	91.6	7.1
Queue Length 50th (ft)	94	0	188	0	~126	89
Queue Length 95th (ft)	164	52	#352	38	#264	152
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	599	803	834	282	1219
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.46	0.74	0.32	1.02	0.44
Intersection Summary						
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	689	56	122	567	97	73	99	89	296	144
v/c Ratio	0.64	0.91	0.15	0.47	0.75	0.23	0.28	0.23	0.21	0.56	0.17
Control Delay	58.8	49.1	8.8	34.3	22.3	2.9	38.1	12.0	7.8	28.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	49.1	8.8	34.3	22.3	2.9	38.1	12.0	7.8	28.4	5.5
Queue Length 50th (ft)	43	178	0	19	108	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#280	29	m40	m147	m4	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	136	757	382	257	757	415	257	427	423	531	862
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.91	0.15	0.47	0.75	0.23	0.28	0.23	0.21	0.56	0.17
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	811	172	397	684	335	182	513	367	357	317	248
v/c Ratio	0.81	0.49	0.27	0.77	0.60	0.46	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	44.2	12.7	2.3	38.3	20.7	4.6	73.5	31.9	12.1	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	12.7	2.3	38.3	20.7	4.6	73.5	31.9	12.1	51.7	51.3	7.3
Queue Length 50th (ft)	71	59	4	108	153	38	92	108	17	92	151	0
Queue Length 95th (ft)	m#111	m66	m7	m#160	m222	m42	#210	163	107	#172	#279	57
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1134	735	210	753	565	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.49	0.27	0.77	0.60	0.46	0.87	0.68	0.65	0.81	0.80	0.47
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1703	72	957	268	24	322	322	449
v/c Ratio	0.71	0.49	0.46	0.17	0.05	0.78	0.82	0.79
Control Delay	9.2	51.2	9.5	0.2	9.5	38.5	42.5	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	51.2	9.5	0.2	9.5	38.5	42.5	29.6
Queue Length 50th (ft)	146	29	163	0	2	143	146	149
Queue Length 95th (ft)	185	m71	m101	m0	17	238	#267	255
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2414	147	2078	1583	576	476	455	640
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.49	0.46	0.17	0.04	0.68	0.71	0.70
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1686	314	902	403	389	181	182	18
v/c Ratio	0.17	0.47	0.20	0.35	0.25	0.83	0.36	0.36	0.03
Control Delay	40.8	14.6	0.2	10.4	0.3	39.0	19.9	19.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	14.6	0.2	10.4	0.3	39.0	19.9	19.9	12.1
Queue Length 50th (ft)	12	179	0	70	0	178	70	70	5
Queue Length 95th (ft)	m16	257	m0	118	m0	223	94	95	14
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3611	1583	2611	1583	730	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.47	0.20	0.35	0.25	0.53	0.23	0.23	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1334	486	174	948	229	483	254	181	380	160
v/c Ratio	0.44	1.31	0.61	0.75	0.72	0.71	0.73	0.49	0.62	0.62	0.38
Control Delay	22.7	168.0	7.9	60.0	29.5	43.2	36.9	7.4	39.4	34.4	7.7
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	168.0	8.4	60.0	29.5	43.2	36.9	7.4	39.4	34.4	7.7
Queue Length 50th (ft)	63	~476	129	88	149	116	123	0	91	96	0
Queue Length 95th (ft)	66	#580	5	#222	#221	#214	176	58	158	138	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1020	799	231	1322	342	707	536	342	720	462
Starvation Cap Reductn	0	0	68	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.31	0.66	0.75	0.72	0.67	0.68	0.47	0.53	0.53	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	136	340	508	119	161	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.28	0.96	0.79	0.19	0.91	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.2	70.2	32.2	4.5	83.1	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.2	70.2	32.2	4.5	83.1	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	70	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	39	#298	#346	31	#176	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	487	354	639	621	177	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.28	0.96	0.79	0.19	0.91	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	↖	→	↙	←	↗	↘	↑	↖	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	828	56	856	427	51	91	623	145
v/c Ratio	1.08	0.84	0.47	0.95	0.76	0.43	0.44	0.81	0.17
Control Delay	150.1	41.0	39.1	39.6	12.5	52.2	22.9	34.4	5.2
Queue Delay	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	150.1	41.5	39.1	39.6	13.0	52.2	22.9	34.4	5.2
Queue Length 50th (ft)	~82	240	31	247	5	28	16	310	9
Queue Length 95th (ft)	#194	#354	m58	#361	#111	65	59	#556	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	118	981	118	904	564	118	366	767	844
Starvation Cap Reductn	0	0	0	0	16	0	0	0	0
Spillback Cap Reductn	0	22	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.86	0.47	0.95	0.78	0.43	0.25	0.81	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	→	↙	↖	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	482	69	1067	674	272
v/c Ratio	0.67	0.63	0.27	0.51	0.61	0.47
Control Delay	12.1	8.3	42.6	18.1	28.6	18.3
Queue Delay	0.4	0.5	0.0	0.3	0.0	0.0
Total Delay	12.5	8.8	42.6	18.4	28.6	18.3
Queue Length 50th (ft)	151	87	38	253	164	75
Queue Length 95th (ft)	m181	m121	m78	314	222	148
Internal Link Dist (ft)		350		370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	767	295	2084	1106	577
Starvation Cap Reductn	138	65	0	404	0	0
Spillback Cap Reductn	34	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.69	0.23	0.64	0.61	0.47
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	412	287
v/c Ratio	0.70	0.30	0.52	0.76
Control Delay	4.9	7.0	31.7	42.5
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	4.9	7.0	31.7	42.5
Queue Length 50th (ft)	189	75	105	143
Queue Length 95th (ft)	250	137	131	205
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2409	2409	1221	574
Starvation Cap Reductn	61	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.30	0.34	0.50
Intersection Summary				

**NEAR-TERM 2008 + ALTERNATIVE H
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	8	14	123	11	132	11	754	97	148	514	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	15	129	12	139	12	794	102	156	541	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1748	1775	544	1739	1727	845	547			896		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1748	1775	544	1739	1727	845	547			896		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	87	97	0	83	62	99			79		
cM capacity (veh/h)	30	65	539	50	70	363	1022			758		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	280	12	896	156	547						
Volume Left	0	129	12	0	156	0						
Volume Right	15	139	0	102	0	6						
cSH	148	90	1022	1700	758	1700						
Volume to Capacity	0.16	3.12	0.01	0.53	0.21	0.32						
Queue Length 95th (ft)	13	Err	1	0	19	0						
Control Delay (s)	33.9	Err	8.6	0.0	11.0	0.0						
Lane LOS	D	F	A		B							
Approach Delay (s)	33.9	Err	0.1		2.4							
Approach LOS	D	F										
Intersection Summary												
Average Delay		1464.4										
Intersection Capacity Utilization		77.8%		ICU Level of Service		D						
Analysis Period (min)		15										

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	233	10	8	245	8	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	245	11	8	258	8	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	266			256			566	555	251	566	556	262
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			256			566	555	251	566	556	262
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	98	99	97	98	99
cM capacity (veh/h)	1298			1309			416	434	788	416	433	777
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	266	275	32	32								
Volume Left	11	8	11	11								
Volume Right	11	8	11	11								
cSH	1298	1309	502	500								
Volume to Capacity	0.01	0.01	0.06	0.06								
Queue Length 95th (ft)	1	0	5	5								
Control Delay (s)	0.4	0.3	12.7	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.3	12.7	12.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay		1.6										
Intersection Capacity Utilization		27.2%		ICU Level of Service		A						
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	232	10	7	241	15	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	244	11	7	254	16	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	269			255			563	555	249	563	552	262
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	269			255			563	555	249	563	552	262
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	98	99	97	98	99
cM capacity (veh/h)	1294			1310			419	434	789	419	436	777
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	277	32	32								
Volume Left	11	7	11	11								
Volume Right	11	16	11	11								
cSH	1294	1310	503	503								
Volume to Capacity	0.01	0.01	0.06	0.06								
Queue Length 95th (ft)	1	0	5	5								
Control Delay (s)	0.4	0.3	12.6	12.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.3	12.6	12.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization		27.4%		ICU Level of Service		A						
Analysis Period (min)		15										

















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	129	113	137	179	8	85	17	114	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	136	119	144	188	8	89	18	120	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	197			255			713	702	195	826	757	193
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197			255			713	702	195	826	757	193
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			89			71	94	86	95	96	99
cM capacity (veh/h)	1376			1310			304	320	846	218	298	849
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	341	227	32								
Volume Left	11	144	89	11								
Volume Right	119	8	120	11								
cSH	1376	1310	462	329								
Volume to Capacity	0.01	0.11	0.49	0.10								
Queue Length 95th (ft)	1	9	67	8								
Control Delay (s)	0.4	4.0	20.1	17.1								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.4	4.0	20.1	17.1								
Approach LOS			C	C								
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization		59.4%		ICU Level of Service		B						
Analysis Period (min)		15										

















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	183	54	424	304	25	20	17	395	17	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	193	57	446	320	26	21	18	416	18	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	346			249			1481	1492	221	1903	1507	333
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	346			249			1481	1492	221	1903	1507	333
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			66			71	78	49	0	96	100
cM capacity (veh/h)	1213			1316			73	81	819	16	79	709
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	793	455	22								
Volume Left	16	446	21	18								
Volume Right	57	26	416	1								
cSH	1213	1316	447	19								
Volume to Capacity	0.01	0.34	1.02	1.18								
Queue Length 95th (ft)	1	38	339	77								
Control Delay (s)	0.6	6.8	77.8	557.9								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.6	6.8	77.8	557.9								
Approach LOS			F	F								
Intersection Summary												
Average Delay		34.7										
Intersection Capacity Utilization		90.7%		ICU Level of Service					E			
Analysis Period (min)		15										






















6: Wilfred Avenue &
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	   												
Sign Control	Free												
Grade	0%												
Volume (veh/h)	11	525	59	82	726	23	21	14	75	14	2	6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	12	553	62	86	764	24	22	15	79	15	2	6	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None								None				
Median storage (veh)													
Upstream signal (ft)	630												
pX, platoon unblocked	0.68						0.68	0.68				0.68	0.68
vC, conflicting volume	788					615	1563	1568	584	1642	1587	776	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	687				615			1833	1840	584	1950	1868	669
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98				91			36	68	85	23	95	98
cM capacity (veh/h)	613				965			34	46	512	19	44	309
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	626	875	116	23									
Volume Left	12	86	22	15									
Volume Right	62	24	79	6									
cSH	613	965	103	28									
Volume to Capacity	0.02	0.09	1.12	0.84									
Queue Length 95th (ft)	1	7	186	67									
Control Delay (s)	0.5	2.3	202.7	323.7									
Lane LOS	A	A	F	F									
Approach Delay (s)	0.5	2.3	202.7	323.7									
Approach LOS				F	F								
Intersection Summary													
Average Delay				20.3									
Intersection Capacity Utilization	92.4%			ICU Level of Service					F				
Analysis Period (min)	15												
























7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1828		1681	1770	1583	1770	3539	1583	3433	1741	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1828		1681	1770	1583	1770	3539	1583	3433	1741	
Volume (vph)	46	500	67	180	558	541	172	154	267	425	128	100
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	526	71	189	587	569	181	162	281	447	135	105
RTOR Reduction (vph)	0	3	0	0	0	240	0	0	258	0	17	0
Lane Group Flow (vph)	0	642	0	189	587	329	181	162	23	447	223	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	48.5			53.5	53.5	53.5	18.6	12.6	12.6	27.4	21.4	
Effective Green, g (s)	49.0			54.0	54.0	54.0	19.1	13.1	13.1	27.9	21.9	
Actuated g/C Ratio	0.31			0.34	0.34	0.34	0.12	0.08	0.08	0.17	0.14	
Clearance Time (s)	4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	560			567	597	534	211	290	130	599	238	
v/s Ratio Prot	c0.35			0.11	c0.33		c0.10	0.05		0.13	c0.13	
v/s Ratio Perm						0.21			0.01			
v/c Ratio	1.15			0.33	0.98	0.62	0.86	0.56	0.18	0.75	0.94	
Uniform Delay, d1	55.5			39.6	52.6	44.3	69.1	70.7	68.4	62.7	68.4	
Progression Factor	1.00			0.88	0.91	1.06	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	85.5			1.3	29.7	4.4	27.4	2.3	0.7	5.0	40.6	
Delay (s)	141.0			36.3	77.5	51.2	96.5	73.0	69.1	64.6	105.5	
Level of Service	F			D	E	D	F	E	E	E	F	
Approach Delay (s)	141.0				60.6			78.1			78.9	
Approach LOS	F				E			E			E	
Intersection Summary												
HCM Average Control Delay	83.4			HCM Level of Service						F		
HCM Volume to Capacity ratio	1.01											
Actuated Cycle Length (s)	160.0			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	98.0%			ICU Level of Service						F		
Analysis Period (min)	15											
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Volume (vph)	5	30	138	5	95	95	164	147	5	30	233	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	145	5	100	100	173	155	5	32	245	5
RTOR Reduction (vph)	0	0	129	0	89	0	0	0	2	0	1	0
Lane Group Flow (vph)	5	32	16	5	111	0	173	155	3	32	249	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		13.5	48.9	48.9	3.3	38.7	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		14.0	49.4	49.4	3.8	39.2	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.18	0.62	0.62	0.05	0.49	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		310	2185	978	84	1729	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.04		0.02	c0.07	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.56	0.07	0.00	0.38	0.14	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.2	6.1	5.9	37.0	11.2	
Progression Factor	1.00	1.00	1.00	0.82	1.30		0.94	0.77	0.69	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.1	0.4		1.5	0.0	0.0	2.9	0.2	
Delay (s)	39.7	32.4	32.1	32.4	42.6		29.9	4.8	4.1	39.8	11.4	
Level of Service	D	C	C	C	D		C	A	A	D	B	
Approach Delay (s)		32.3			42.4			17.8			14.6	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay	24.6			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.26											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	31.4%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												













9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖↗	↕↕					↖	↖↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3071	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3071	
Volume (vph)	0	751	440	93	727	0	0	0	0	327	327	552
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	791	463	98	765	0	0	0	0	344	344	581
RTOR Reduction (vph)	0	0	140	0	0	0	0	0	0	0	129	0
Lane Group Flow (vph)	0	791	323	98	765	0	0	0	0	344	796	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3	8							6
Permitted Phases		4								6		
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	998	
v/s Ratio Prot		c0.22		0.03	c0.22							
v/s Ratio Perm		0.20								0.21	0.26	
v/c Ratio		0.48	0.44	0.47	0.38					0.66	0.94dr	
Uniform Delay, d1		14.8	14.5	36.3	9.2					23.2	24.6	
Progression Factor		1.18	1.68	1.21	1.69					1.00	1.00	
Incremental Delay, d2		0.4	0.8	1.2	0.4					6.4	6.6	
Delay (s)		17.8	25.0	45.1	15.9					29.5	31.2	
Level of Service		B	C	D	B					C	C	
Approach Delay (s)		20.5			19.2		0.0			30.8		
Approach LOS		C			B		A			C		
Intersection Summary												
HCM Average Control Delay		24.0		HCM Level of Service						C		
HCM Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization		64.8%		ICU Level of Service						C		
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												












10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Flt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3392		1681	1713	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3392		1681	1713	2787	1770	1814	
Volume (vph)	0	495	583	409	301	116	509	107	572	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	521	614	431	317	122	536	113	602	44	43	9
RTOR Reduction (vph)	0	0	476	0	41	0	0	0	478	0	7	0
Lane Group Flow (vph)	0	521	138	431	398	0	316	333	124	44	45	0
Turn Type	Prot	Perm		Prot		Split		Perm		Split		
Protected Phases	7	4	3		8	2		2	6		6	
Permitted Phases	4						2					
Actuated Green, G (s)	17.5		17.5	12.5	34.5	16.0		16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0		18.0	13.0	35.0	16.5		16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22		0.22	0.16	0.44	0.21		0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144		356	558	1484	347		353	575	365	374	
v/s Ratio Prot	c0.10			c0.13	0.12	0.19		c0.19		c0.02	0.02	
v/s Ratio Perm			0.09						0.04			
v/c Ratio	0.46		0.39	0.77	0.27	0.91		0.94	0.22	0.12	0.12	
Uniform Delay, d1	26.8		26.3	32.1	14.3	31.0		31.3	26.4	25.8	25.8	
Progression Factor	1.45		9.36	1.19	1.24	1.00		0.99	2.24	0.86	0.84	
Incremental Delay, d2	1.1		2.7	6.1	0.4	25.4		30.3	0.7	0.7	0.7	
Delay (s)	40.0		249.0	44.2	18.2	56.3		61.4	59.7	23.0	22.5	
Level of Service	D		F	D	B	E		E	E	C	C	
Approach Delay (s)	153.1				31.1	59.3				22.7		
Approach LOS	F				C	E				C		
Intersection Summary												
HCM Average Control Delay	82.7			HCM Level of Service					F			
HCM Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	61.1%			ICU Level of Service					B			
Analysis Period (min)	15											
c Critical Lane Group												





















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3510		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3510		1770	1583
Volume (vph)	187	922	610	35	93	217
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	971	642	37	98	228
RTOR Reduction (vph)	0	0	4	0	0	168
Lane Group Flow (vph)	197	971	675	0	98	60
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.8	50.5	36.2		20.5	20.5
Effective Green, g (s)	10.3	51.0	36.7		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	442	2256	1610		465	416
v/s Ratio Prot	0.06	c0.27	0.19		c0.06	
v/s Ratio Perm						0.04
v/c Ratio	0.45	0.43	0.42		0.21	0.14
Uniform Delay, d1	32.2	7.2	14.5		23.0	22.6
Progression Factor	0.94	2.03	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.5	0.8		1.0	0.7
Delay (s)	31.0	15.3	15.3		24.1	23.3
Level of Service	C	B	B		C	C
Approach Delay (s)		17.9	15.3		23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		17.9		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.37				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		38.5%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	708	3	40	8	3	5	514	475	2	7	408	619
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	745	3	42	8	3	5	541	500	2	7	429	652
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	536
Lane Group Flow (vph)	373	375	11	0	11	0	541	501	0	7	429	116
Turn Type	Split		Perm		Split		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	19.7	19.7	19.7		1.5		27.1	39.3		1.5	13.7	13.7
Effective Green, g (s)	20.2	20.2	20.2		2.0		27.6	39.8		2.0	14.2	14.2
Actuated g/C Ratio	0.25	0.25	0.25		0.02		0.35	0.50		0.02	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	424	426	400		44		611	1760		44	628	281
v/s Ratio Prot	0.22	c0.22			c0.01		c0.31	0.14		0.00	c0.12	
v/s Ratio Perm			0.01									0.07
v/c Ratio	0.88	0.88	0.03		0.25		0.89	0.28		0.16	0.68	0.41
Uniform Delay, d1	28.7	28.7	22.5		38.3		24.7	11.8		38.2	30.8	29.2
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.29	1.14	5.40
Incremental Delay, d2	18.4	18.6	0.0		3.0		14.4	0.4		1.1	4.0	3.0
Delay (s)	47.1	47.4	22.5		41.3		39.1	12.2		50.3	39.2	160.5
Level of Service	D	D	C		D		D	B		D	D	F
Approach Delay (s)		45.9			41.3		26.1				112.0	
Approach LOS		D			D		C				F	
Intersection Summary												
HCM Average Control Delay		63.3		HCM Level of Service					E			
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)					16.0			
Intersection Capacity Utilization		80.1%		ICU Level of Service					D			
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	872	0	0	670
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	918	0	0	705
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1623	918			918	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1623	918			918	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	113	329			743	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	918	705			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.54	0.41			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		49.2%		ICU Level of Service	A	
Analysis Period (min)		15				













14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Volume (veh/h)	211	105	74	0	0	222
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	222	111	78	0	0	234
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	78				633	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				633	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				100	76
cM capacity (veh/h)	1521				379	983
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	333	78	234			
Volume Left	222	0	0			
Volume Right	0	0	234			
cSH	1521	1700	983			
Volume to Capacity	0.15	0.05	0.24			
Queue Length 95th (ft)	13	0	23			
Control Delay (s)	5.6	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	5.6	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay		6.4				
Intersection Capacity Utilization		44.3%		ICU Level of Service	A	
Analysis Period (min)		15				













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	172	89	33	464	489	41	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	181	94	35	488	515	43	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	850	279	558				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	850	279	558				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	37	87	97				
cM capacity (veh/h)	289	718	1009				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	181	94	35	244	244	343	215
Volume Left	181	0	35	0	0	0	0
Volume Right	0	94	0	0	0	0	43
cSH	289	718	1009	1700	1700	1700	1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20	0.13
Queue Length 95th (ft)	97	11	3	0	0	0	0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	B	A				
Approach Delay (s)	27.5		0.6			0.0	
Approach LOS	D						
Intersection Summary							
Average Delay	5.8						
Intersection Capacity Utilization	37.7%			ICU Level of Service		A	
Analysis Period (min)	15						

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	286	586	251	212	457
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	301	617	264	223	481
RTOR Reduction (vph)	0	235	0	150	0	0
Lane Group Flow (vph)	271	66	617	114	223	481
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.7	26.7	9.4	40.6
Effective Green, g (s)	13.8	13.8	27.2	27.2	9.9	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	806	685	279	1217
v/s Ratio Prot	c0.15		c0.33		c0.13	
v/s Ratio Perm			0.04		0.07	
v/c Ratio	0.70	0.19	0.77	0.17	0.80	0.40
Uniform Delay, d1	22.6	20.0	15.1	10.9	25.5	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.3	6.8	0.5	14.7	1.0
Delay (s)	28.0	20.3	22.0	11.4	40.3	6.1
Level of Service	C	C	C	B	D	A
Approach Delay (s)	24.0		18.8			16.9
Approach LOS	C		B			B
Intersection Summary						
HCM Average Control Delay		19.6		HCM Level of Service		B
HCM Volume to Capacity ratio		0.75				
Actuated Cycle Length (s)		62.9		Sum of lost time (s)		12.0
Intersection Capacity Utilization		66.8%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	600	36	202	575	365	64	19	154	492	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	384	67	20	162	518	45	104
RTOR Reduction (vph)	0	0	29	0	0	285	0	63	69	0	59	0
Lane Group Flow (vph)	53	632	9	213	605	99	67	34	16	518	90	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.0	18.0	5.5	20.2	20.2	4.4	14.1	14.1	24.4	34.1	
Effective Green, g (s)	3.8	18.5	18.5	6.0	20.7	20.7	4.9	14.6	14.6	24.9	34.6	
Actuated g/C Ratio	0.05	0.23	0.23	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	257	916	410	210	285	274	551	721	
v/s Ratio Prot	0.03	c0.18		c0.06	0.17		c0.02	c0.02		c0.29	0.05	
v/s Ratio Perm			0.01			0.06			0.01			
v/c Ratio	0.63	0.77	0.02	0.83	0.66	0.24	0.32	0.12	0.06	0.94	0.12	
Uniform Delay, d1	37.4	28.8	23.8	36.5	26.5	23.4	36.0	27.3	27.0	26.8	13.6	
Progression Factor	1.00	1.00	1.00	0.94	0.51	0.44	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	13.8	1.2	0.2	0.9	0.9	0.4	24.4	0.4	
Delay (s)	51.8	33.3	23.8	48.2	14.7	10.5	36.8	28.2	27.4	51.2	14.0	
Level of Service	D	C	C	D	B	B	D	C	C	D	B	
Approach Delay (s)		34.2			19.3			30.2			42.9	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM Average Control Delay		29.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		66.3%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	923	146	371	867	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	972	154	391	913	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	250	0	117	227	0	0	206
Lane Group Flow (vph)	245	972	51	391	913	127	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.2	26.0	26.0	11.5	25.3	25.3	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.7	26.5	26.5	12.0	25.8	25.8	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	1684	524	515	1141	511	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.19		0.11	c0.26		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.87	0.58	0.10	0.76	0.80	0.25	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	22.1	18.5	32.6	24.7	20.0	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.77	0.67	0.88	0.73	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.9	0.9	0.2	4.9	4.6	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	41.1	15.7	16.5	28.5	20.6	13.9	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	B	C	C	B	D	C	C	D	D	C
Approach Delay (s)		20.4			20.9			32.5			35.9	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.7			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		72.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↓	↑↑	↑		↓		↓	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Flt		0.96		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4865		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4865		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1215	493	68	1235	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1279	519	72	1300	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	86	0	0	0	0	0	12	0	0	0	28
Lane Group Flow (vph)	0	1712	0	72	1300	209	0	13	0	370	370	341
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2183		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.35		0.04	c0.37							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.22
v/c Ratio		0.78		0.62	0.65	0.13		0.03		0.84	0.88	0.64
Uniform Delay, d1		18.8		36.4	12.0	0.0		17.8		24.6	25.1	22.6
Progression Factor		0.36		1.27	0.75	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		2.3		7.3	1.3	0.1		0.0		13.7	18.9	2.7
Delay (s)		9.0		53.5	10.2	0.1		17.9		38.4	44.0	25.2
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.0			10.9			17.9			35.9	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.3				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		74.4%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑		↑	↑		↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	0.86		1.00	0.91		1.00	0.95		0.95	1.00
Flt		1.00	1.00		0.85	1.00		0.85	1.00		0.85	0.98
Flt Protected		0.95	1.00		1.00	1.00		0.95	1.00		1.00	0.96
Satd. Flow (prot)		1770	6408		1583	5085		1583	1770		1504	1748
Flt Permitted		0.95	1.00		1.00	1.00		0.75	1.00		1.00	0.83
Satd. Flow (perm)		1770	6408		1583	5085		1583	1389		1504	1518
Volume (vph)	17	1638	273		993	350	505	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1724	287		1045	368	532	0	322	15	0	3
RTOR Reduction (vph)	0	0	0		0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1724	287		1045	368	532	160	160	0	16	0
Turn Type				Prot		Free		Free	Perm		Perm	Perm
Protected Phases		7	4			8			2			6
Permitted Phases					Free		2		2		2	6
Actuated Green, G (s)		2.2	37.1		80.0	30.4	80.0		33.9	33.9	33.9	33.9
Effective Green, g (s)		2.7	37.6		80.0	30.9	80.0		34.4	34.4	34.4	34.4
Actuated g/C Ratio		0.03	0.47		1.00	0.39	1.00		0.43	0.43	0.43	0.43
Clearance Time (s)		4.5	4.5			4.5			4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0			3.0			3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		60	3012		1583	1964	1583		597	647	647	653
v/s Ratio Prot		0.01	c0.27			0.21			0.11			
v/s Ratio Perm					0.18		0.23		c0.38		0.11	0.01
v/c Ratio		0.30	0.57		0.18	0.53	0.23		0.89	0.25	0.25	0.02
Uniform Delay, d1		37.7	15.4		0.0	19.0	0.0		21.1	14.5	14.5	13.1
Progression Factor		1.04	1.05		1.00	0.64	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6	0.5		0.1	0.8	0.3		15.5	0.2	0.2	0.0
Delay (s)		40.9	16.7		0.1	12.9	0.3		36.5	14.7	14.7	13.2
Level of Service		D	B		A	B	A		D	B	B	B
Approach Delay (s)		14.5				9.6			28.3			13.2
Approach LOS		B				A			C			B
Intersection Summary												
HCM Average Control Delay		15.6				HCM Level of Service		B				
HCM Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)		8.0				
Intersection Capacity Utilization		61.8%				ICU Level of Service		B				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949	1610	3329	1583	1610	3390	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949	1610	3329	1583	1610	3390	1583	1583
Volume (vph)	270	1145	545	141	779	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1205	574	148	820	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	39	0	0	189	0	0	164	0
Lane Group Flow (vph)	284	1205	179	148	960	0	226	475	47	107	242	29
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Perm
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6	15.4	15.4	15.4	11.5	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1	15.9	15.9	15.9	12.0	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29	0.20	0.20	0.20	0.15	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429	320	662	315	242	509	237	237
v/s Ratio Prot	0.08	c0.34	0.08	c0.19	0.14	c0.14	0.07	c0.07	0.07	c0.07	0.07	0.07
v/s Ratio Perm	0.51	1.09	0.36	0.60	0.67	0.71	0.72	0.15	0.44	0.48	0.12	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.1	29.9	30.0	26.5	31.0	31.1	29.4	29.4
Progression Factor	0.55	0.53	1.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	53.3	1.8	4.1	2.5	6.9	3.7	0.2	1.3	0.7	0.2	0.2
Delay (s)	17.6	67.8	40.5	36.5	27.6	36.8	33.7	26.7	32.2	31.8	29.7	29.7
Level of Service	B	E	D	D	C	D	C	C	C	C	C	C
Approach Delay (s)	53.3	28.8	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Approach LOS	D	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	40.6	HCM Level of Service	D	D	D	D	D	D	D	D	D	D
HCM Volume to Capacity ratio	0.83	Sum of lost time (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Actuated Cycle Length (s)	80.0	ICU Level of Service	C	C	C	C	C	C	C	C	C	C
Intersection Capacity Utilization	71.8%	Analysis Period (min)	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	3383	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383	1770	3539	1583	1770	1863	1583	1770	1863	1583	1583
Volume (vph)	133	484	202	128	589	143	321	494	108	132	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	151	338	520	114	139	360	231
RTOR Reduction (vph)	0	67	0	0	115	0	0	75	0	0	174	0
Lane Group Flow (vph)	140	655	0	135	620	36	338	520	39	139	360	57
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	5.5	15.8	5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5	16.5
Effective Green, g (s)	6.0	16.3	6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24	0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25	0.25
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796	153	832	372	358	645	548	179	457	388	388
v/s Ratio Prot	c0.08	c0.19	0.08	0.18	c0.19	c0.28	0.08	0.19	0.08	0.19	0.08	0.19
v/s Ratio Perm	0.92	0.82	0.88	0.75	0.10	0.94	0.81	0.07	0.78	0.79	0.15	0.15
Uniform Delay, d1	31.4	25.1	31.3	24.6	20.7	27.3	20.5	15.2	30.4	24.5	20.5	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9	40.4	3.7	0.1	33.1	10.4	0.3	18.8	12.9	0.8	0.8
Delay (s)	79.5	32.0	71.7	28.2	20.8	60.4	30.9	15.4	49.2	37.3	21.3	21.3
Level of Service	E	C	E	C	C	E	C	B	D	D	C	C
Approach Delay (s)	39.7	33.5	39.4	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Approach LOS	D	C	D	C	C	D	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	36.9	HCM Level of Service	D	D	D	D	D	D	D	D	D	D
HCM Volume to Capacity ratio	0.84	Sum of lost time (s)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Actuated Cycle Length (s)	69.3	ICU Level of Service	D	D	D	D	D	D	D	D	D	D
Intersection Capacity Utilization	76.0%	Analysis Period (min)	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3514		1770	3539	1583	1770	1660		1770	1649	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3514		1770	3539	1583	1770	1660		1770	1649	
Volume (vph)	102	661	32	53	778	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	696	34	56	819	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	0	132	0	61	0	0	60	0
Lane Group Flow (vph)	107	727	0	56	819	219	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1124		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.21		0.03	c0.23		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm						0.14						
v/c Ratio	0.67	0.65		0.58	0.81	0.49	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.2		41.6	30.0	26.7	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.67	0.58	0.21	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	2.9		8.0	6.6	3.4	22.4	1.0		5.7	0.1	
Delay (s)	50.4	29.1		35.7	24.0	9.0	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		31.8			20.2			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		26.8										
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		90.0						20.0				
Intersection Capacity Utilization		72.5%										
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	819	397	99	940	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	418	104	989	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	105	0	0	0	0	0	0	0	81	0
Lane Group Flow (vph)	0	862	313	104	989	0	0	0	0	673	142	0
Turn Type				Perm	Prot					Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06	c0.28					c0.20	0.09	
v/s Ratio Perm			0.20									
v/c Ratio		0.59	0.48	0.44	0.47					0.61	0.28	
Uniform Delay, d1		20.7	19.5	35.8	10.6					25.7	22.7	
Progression Factor		0.54	0.49	1.27	1.69					1.00	1.00	
Incremental Delay, d2		1.3	1.9	1.2	0.7					1.0	1.4	
Delay (s)		12.6	11.4	46.6	18.6					26.7	24.1	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		12.2			21.3				0.0		26.0	
Approach LOS		B			C				A		C	
Intersection Summary												
HCM Average Control Delay			19.0									
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			90.0							8.0		
Intersection Capacity Utilization			61.7%									
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	391	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	412	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	412	227
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	63.0			63.0	18.0	18.0
Effective Green, g (s)	63.5			63.5	18.5	18.5
Actuated g/C Ratio	0.71			0.71	0.21	0.21
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2497			2497	706	325
v/s Ratio Prot	c0.43			0.18	0.12	
v/s Ratio Perm					c0.14	
v/c Ratio	0.62			0.26	0.58	0.70
Uniform Delay, d1	6.9			4.8	32.3	33.2
Progression Factor	0.32			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	1.2	6.4
Delay (s)	3.2			5.0	33.5	39.6
Level of Service	A			A	C	D
Approach Delay (s)	3.2			5.0	35.8	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay		11.2			HCM Level of Service	B
HCM Volume to Capacity ratio		0.63				
Actuated Cycle Length (s)		90.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		61.7%			ICU Level of Service	B
Analysis Period (min)		15				
c Critical Lane Group						

















26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↑	↗	↖	↖	↕
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Volume (veh/h)	8	5	10	1	6	211	19	770	17	113	631	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	5	11	1	6	222	20	811	18	119	664	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						5						
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1464	1773	334	1434	1757	405	668			828		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1464	1773	334	1434	1757	405	668			828		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	92	98	99	91	63	98			85		
cM capacity (veh/h)	46	68	662	76	70	595	917			799		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	24	229	20	405	405	18	119	443	226			
Volume Left	8	1	20	0	0	0	119	0	0			
Volume Right	11	222	0	0	0	18	0	0	4			
cSH	87	615	917	1700	1700	1700	799	1700	1700			
Volume to Capacity	0.28	0.37	0.02	0.24	0.24	0.01	0.15	0.26	0.13			
Queue Length 95th (ft)	25	43	2	0	0	0	13	0	0			
Control Delay (s)	61.3	16.1	9.0	0.0	0.0	0.0	10.3	0.0	0.0			
Lane LOS	F	C	A				B					
Approach Delay (s)	61.3	16.1	0.2				1.6					
Approach LOS	F	C										
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			47.7%			ICU Level of Service			A			
Analysis Period (min)			15									

















27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Volume (veh/h)	1	134	3	3	216	2	1	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	141	3	3	227	2	1	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	229			144			380	381	143	381	381	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			144			380	381	143	381	381	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1339			1438			576	550	905	575	550	811
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	145	233	2	1								
Volume Left	1	3	1	0								
Volume Right	3	2	1	0								
cSH	1339	1438	704	550								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.1	10.1	11.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.1	11.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization	23.5%		ICU Level of Service		A							
Analysis Period (min)	15											

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free				Free				Stop		Stop	
Grade	0%											
Volume (veh/h)	1	119	2	4	225	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	125	2	4	237	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	245			127			379	382	126	383	379	241
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			127			379	382	126	383	379	241
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1321			1459			576	549	924	566	551	798
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	128	249	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1321	1459	551	601								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.7	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.7	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization	24.9%		ICU Level of Service		A							
Analysis Period (min)			15									

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↙	↘
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	150	5	2	280	10	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	5	2	295	11	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			163		459	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		459	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1415		559	885
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	163	297	17			
Volume Left	0	2	11			
Volume Right	5	0	6			
cSH	1700	1415	648			
Volume to Capacity	0.10	0.00	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		26.3%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↖	→	↗	↖	←	↙	↘	↑	↗	↖	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↖			↖			↖	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	4	10	252	0	31	0	11	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	4	11	265	0	33	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	265			167			452	452	165	463	454	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			167			452	452	165	463	454	265
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			94	100	99	100	100	100
cM capacity (veh/h)	1299			1410			515	500	879	499	498	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	167	276	44	0								
Volume Left	0	11	33	0								
Volume Right	4	0	12	0								
cSH	1299	1410	578	1700								
Volume to Capacity	0.00	0.01	0.08	0.00								
Queue Length 95th (ft)	0	1	6	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization		31.4%			ICU Level of Service	A						
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	143	20	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	151	21	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1405		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	247	34			
Volume Left	0	0	34			
Volume Right	21	0	0			
cSH	1700	1405	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↗	←	↖	↖	↑	↗	↘	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	645	189	587	569	181	162	281	447	240
v/c Ratio	1.15	0.33	0.98	0.74	0.85	0.56	0.72	0.75	0.94
Control Delay	133.4	36.8	77.3	22.3	101.7	77.7	18.3	68.3	101.5
Queue Delay	20.9	4.8	163.8	5.8	0.0	0.0	0.3	2.8	0.0
Total Delay	154.3	41.6	241.1	28.2	101.7	77.7	18.6	71.0	101.5
Queue Length 50th (ft)	~800	142	682	175	188	87	0	229	234
Queue Length 95th (ft)	#1051	m189	#930	302	#317	126	97	#316	#410
Internal Link Dist (ft)	550		220			110			270
Turn Bay Length (ft)					150		100	275	
Base Capacity (vph)	563	567	597	774	221	376	419	598	257
Starvation Cap Reductn	0	307	175	152	0	0	0	0	0
Spillback Cap Reductn	23	0	0	0	0	0	12	72	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.73	1.39	0.91	0.82	0.43	0.69	0.85	0.93
Intersection Summary									
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↗	→	↘	↖	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	145	5	200	173	155	5	32	250
v/c Ratio	0.04	0.15	0.47	0.04	0.44	0.56	0.06	0.00	0.20	0.13
Control Delay	34.4	32.8	11.6	28.0	24.1	32.7	4.7	4.0	35.8	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.6	28.0	24.1	32.7	4.7	4.0	35.8	11.7
Queue Length 50th (ft)	2	15	0	2	30	87	4	0	15	30
Queue Length 95th (ft)	13	39	49	m5	m50	m109	m41	m1	40	72
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	487	155	854	400	2464	1104	184	1891
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.06	0.00	0.17	0.13
Intersection Summary										
m	Volume for 95th percentile queue is metered by upstream signal.									

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	791	463	98	765	344	925
v/c Ratio	0.47	0.52	0.38	0.38	0.66	0.94dr
Control Delay	17.7	11.5	45.9	16.0	30.3	26.9
Queue Delay	2.2	2.5	0.0	0.1	0.0	4.5
Total Delay	19.9	14.0	45.9	16.1	30.3	31.4
Queue Length 50th (ft)	200	167	22	107	160	186
Queue Length 95th (ft)	m226	m190	m29	m128	261	#270
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	889	257	2035	523	1127
Starvation Cap Reductn	714	297	0	0	0	0
Spillback Cap Reductn	0	0	0	325	0	140
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.78	0.38	0.45	0.66	0.94

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	521	614	431	439	316	333	602	44	52
v/c Ratio	0.46	0.74	0.77	0.29	0.91	0.94	0.57	0.12	0.14
Control Delay	40.2	23.0	48.2	15.3	58.9	64.1	7.8	23.2	19.0
Queue Delay	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	25.1	48.2	15.3	58.9	64.1	7.8	23.2	19.0
Queue Length 50th (ft)	128	170	119	91	122	128	5	22	23
Queue Length 95th (ft)	153	266	#178	125 m	#237 m	#254 m	45	43	44
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	832	558	1525	347	353	1053	365	381
Starvation Cap Reductn	0	107	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.85	0.77	0.29	0.91	0.94	0.57	0.12	0.14

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	197	971	679	98	228
v/c Ratio	0.45	0.43	0.42	0.21	0.39
Control Delay	33.0	15.4	15.6	24.5	5.8
Queue Delay	0.0	0.5	0.0	0.0	0.0
Total Delay	33.0	15.8	15.6	24.5	5.8
Queue Length 50th (ft)	61	217	113	38	0
Queue Length 95th (ft)	84	249	166	77	51
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1617	465	584
Starvation Cap Reductn	0	740	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.64	0.42	0.21	0.39
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	373	375	42	16	541	502	7	429	652
v/c Ratio	0.88	0.88	0.10	0.11	1.02	0.24	0.05	0.45	0.72
Control Delay	52.4	52.5	8.3	29.3	74.3	10.5	43.3	30.7	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	52.4	52.5	8.3	29.3	74.3	10.5	43.3	30.7	14.4
Queue Length 50th (ft)	186	187	0	5	~278	48	4	121	153
Queue Length 95th (ft)	#341	#343	23	23	#478	142	m5	#188	174
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2081	177	949	902
Starvation Cap Reductn	0	0	0	0	0	0	0	0	78
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.85	0.09	0.09	1.02	0.24	0.04	0.45	0.79
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	301	617	264	223	481
v/c Ratio	0.70	0.52	0.77	0.32	0.80	0.40
Control Delay	32.9	6.5	24.2	3.0	50.2	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	6.5	24.2	3.0	50.2	6.7
Queue Length 50th (ft)	96	0	201	0	86	78
Queue Length 95th (ft)	168	54	#375	38	#194	132
Internal Link Dist (ft)	480		3920		2550	
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	617	805	834	281	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.49	0.77	0.32	0.79	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	632	38	213	605	384	67	97	85	518	149
v/c Ratio	0.40	0.86	0.11	0.83	0.66	0.55	0.26	0.24	0.22	0.98	0.18
Control Delay	44.6	43.6	9.9	55.0	17.6	3.7	37.7	11.2	8.0	63.6	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	43.6	9.9	55.0	17.6	3.7	37.7	11.2	8.0	63.6	5.7
Queue Length 50th (ft)	26	160	0	42	80	0	16	8	0	254	13
Queue Length 95th (ft)	61	#245	23	m#80	m#156	m4	36	48	36	#451	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	915	694	257	398	393	531	833
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.84	0.10	0.83	0.66	0.55	0.26	0.24	0.22	0.98	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	972	154	391	913	377	144	435	274	383	278	256
v/c Ratio	0.88	0.58	0.25	0.76	0.80	0.50	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	47.5	16.0	3.9	32.5	21.5	3.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	16.0	3.9	32.5	21.5	3.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	83	95	9	108	229	27	71	74	0	95	129	0
Queue Length 95th (ft)	m116	m108	m13	#156	#264	37	#157	118	65	#188	#230	58
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1143	761	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.58	0.25	0.76	0.80	0.50	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↘	←	↖	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1798	72	1300	209	25	370	370	369
v/c Ratio	0.77	0.51	0.65	0.13	0.05	0.84	0.88	0.66
Control Delay	8.8	56.1	10.9	0.1	9.8	43.2	48.5	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	56.1	10.9	0.1	9.8	43.2	48.5	25.9
Queue Length 50th (ft)	125	38	237	0	2	169	172	131
Queue Length 95th (ft)	161	m65	m141	m0	18	#318	#329	222
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2325	142	2000	1583	568	475	455	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.51	0.65	0.13	0.04	0.78	0.81	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1724	287	1045	368	532	161	161	18
v/c Ratio	0.14	0.57	0.18	0.49	0.23	0.89	0.25	0.25	0.03
Control Delay	37.6	18.3	0.1	13.8	0.3	38.0	13.7	13.7	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	18.3	0.1	13.8	0.3	38.0	13.7	13.7	8.8
Queue Length 50th (ft)	10	204	0	80	0	227	49	49	4
Queue Length 95th (ft)	m12	m274	m0	131	m0	321	76	76	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3009	1583	2133	1583	730	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.57	0.18	0.49	0.23	0.73	0.20	0.20	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1205	574	148	999	226	475	236	107	242	193
v/c Ratio	0.51	1.09	0.64	0.60	0.68	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	20.0	72.7	7.6	46.8	28.1	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	72.7	8.9	46.8	28.1	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	59	~401	0	69	153	114	120	0	54	62	0
Queue Length 95th (ft)	69	#485	90	#187	#249	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1107	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	145	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.09	0.77	0.60	0.68	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	151	338	520	114	139	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.31	0.95	0.81	0.18	0.78	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.2	66.8	32.8	4.5	61.8	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.2	66.8	32.8	4.5	61.8	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	60	146	0
Queue Length 95th (ft)	#162	#221	#155	184	41	#296	#358	30	#148	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	499	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.30	0.95	0.81	0.18	0.78	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	107	730	56	819	351	51	91	511	132		
v/c Ratio	0.67	0.59	0.47	0.76	0.58	0.43	0.44	0.80	0.18		
Control Delay	64.2	29.6	39.4	23.6	6.5	52.2	21.8	35.9	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.2	29.6	39.4	23.6	6.5	52.2	21.8	35.9	5.8		
Queue Length 50th (ft)	61	200	33	244	4	28	14	237	10		
Queue Length 95th (ft)	#161	#276	m65	#347	19	65	57	#388	43		
Internal Link Dist (ft)		6630		350			200		236		
Turn Bay Length (ft)	225		150		80	50		225			
Base Capacity (vph)	159	1232	118	1077	610	118	367	653	782		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.67	0.59	0.47	0.76	0.58	0.43	0.25	0.78	0.17		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	418	104	989	673	223
v/c Ratio	0.58	0.54	0.39	0.47	0.61	0.38
Control Delay	13.0	8.1	47.3	18.9	28.6	13.1
Queue Delay	0.2	0.3	0.0	0.3	0.0	0.0
Total Delay	13.2	8.4	47.3	19.2	28.6	13.1
Queue Length 50th (ft)	125	64	58	233	164	43
Queue Length 95th (ft)	155	m99	m106	291	222	101
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	768	295	2084	1106	591
Starvation Cap Reductn	139	65	0	492	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.59	0.35	0.62	0.61	0.38
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	412	248
v/c Ratio	0.62	0.26	0.59	0.72
Control Delay	3.5	5.8	34.9	40.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	5.8	34.9	40.8
Queue Length 50th (ft)	0	58	110	119
Queue Length 95th (ft)	243	112	137	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2498	2498	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.34	0.43
Intersection Summary				

**CUMULATIVE 2020 + ALTERNATIVE H
TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	17	129	23	130	14	740	184	177	522	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	13	18	136	24	137	15	779	194	186	549	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1814	1927	553	1852	1834	876	556			973		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1814	1927	553	1852	1834	876	556			973		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	74	97	0	56	61	99			74		
cM capacity (veh/h)	19	48	533	35	55	348	1015			709		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	31	297	15	973	186	556						
Volume Left	0	136	15	0	186	0						
Volume Right	18	137	0	194	0	6						
cSH	103	63	1015	1700	709	1700						
Volume to Capacity	0.30	4.71	0.01	0.57	0.26	0.33						
Queue Length 95th (ft)	28	Err	1	0	26	0						
Control Delay (s)	53.8	Err	8.6	0.0	11.9	0.0						
Lane LOS	F	F	A		B							
Approach Delay (s)	53.8	Err	0.1		3.0							
Approach LOS	F	F										
Intersection Summary												
Average Delay		1445.0										
Intersection Capacity Utilization		85.0%		ICU Level of Service		E						
Analysis Period (min)		15										

















2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	328	20	8	263	10	10	10	10	9	9	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	345	21	8	277	11	11	11	11	9	9	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	287			366			723	713	356	723	718	282
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			366			723	713	356	723	718	282
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			97	97	98	97	97	99
cM capacity (veh/h)	1275			1192			323	348	688	322	345	757
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	393	296	32	29								
Volume Left	26	8	11	9								
Volume Right	21	11	11	11								
cSH	1275	1192	404	416								
Volume to Capacity	0.02	0.01	0.08	0.07								
Queue Length 95th (ft)	2	1	6	6								
Control Delay (s)	0.7	0.3	14.7	14.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.7	0.3	14.7	14.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay		1.7										
Intersection Capacity Utilization		40.0%		ICU Level of Service		A						
Analysis Period (min)		15										

















3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	325	11	11	263	25	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	342	12	12	277	26	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	303			354			700	697	348	700	690	290
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			354			700	697	348	700	690	290
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	98	97	97	99
cM capacity (veh/h)	1258			1205			336	358	695	336	361	749
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	365	315	32	32								
Volume Left	12	12	11	11								
Volume Right	12	26	11	11								
cSH	1258	1205	416	424								
Volume to Capacity	0.01	0.01	0.08	0.07								
Queue Length 95th (ft)	1	1	6	6								
Control Delay (s)	0.3	0.4	14.4	14.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.4	14.4	14.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			32.1%		ICU Level of Service		A					
Analysis Period (min)			15									



















4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free 				Free 		Stop 				Stop 	
Grade	0%				0%		0%				0%	
Volume (veh/h)	44	187	114	138	199	32	83	15	112	23	10	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	197	120	145	209	34	87	16	118	24	11	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	243			317			873	883	257	975	909	209
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			317			873	883	257	975	909	209
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			88			62	93	85	85	96	98
cM capacity (veh/h)	1323			1243			227	243	782	165	234	831
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	363	145	209	34	221	53						
Volume Left	46	145	0	0	87	24						
Volume Right	120	0	0	34	118	18						
cSH	1323	1243	1700	1700	368	247						
Volume to Capacity	0.04	0.12	0.12	0.02	0.60	0.21						
Queue Length 95th (ft)	3	10	0	0	94	20						
Control Delay (s)	1.3	8.3	0.0	0.0	28.5	23.5						
Lane LOS	A	A			D	C						
Approach Delay (s)	1.3	3.1			28.5	23.5						
Approach LOS					D	C						
Intersection Summary												
Average Delay			9.0									
Intersection Capacity Utilization			54.5%	ICU Level of Service		A						
Analysis Period (min)			15									



















5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	20	242	60	486	316	75	49	24	558	65	11	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	255	63	512	333	79	52	25	587	68	12	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	412			318			1528	1763	159	2165	1755	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	412			318			1528	1763	159	2165	1755	206
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			59			0	47	32	0	76	99
cM capacity (veh/h)	1144			1239			44	48	858	3	49	801
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	21	170	148	512	222	190	664	84				
Volume Left	21	0	0	512	0	0	52	68				
Volume Right	0	0	63	0	0	79	587	4				
cSH	1144	1700	1700	1239	1700	1700	280	4				
Volume to Capacity	0.02	0.10	0.09	0.41	0.13	0.11	2.37	20.38				
Queue Length 95th (ft)	1	0	0	52	0	0	1319	Err				
Control Delay (s)	8.2	0.0	0.0	9.9	0.0	0.0	657.8	Err				
Lane LOS	A			A			F	F				
Approach Delay (s)	0.5			5.5			657.8	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay	638.7											
Intersection Capacity Utilization	83.0%			ICU Level of Service			E					
Analysis Period (min)	15											

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop		Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	23	660	182	327	732	98	98	67	352	76	15	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	695	192	344	771	103	103	71	371	80	16	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage veh												
Upstream signal (ft)	630											
pX, platoon unblocked												
vC, conflicting volume	874			886			1969	2401	443	2312	2445	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874			886			1969	2401	443	2312	2445	437
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			55			0	0	34	0	3	91
cM capacity (veh/h)	768			760			3	17	562	0	16	568
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	24	463	423	344	514	360	544	144				
Volume Left	24	0	0	344	0	0	103	80				
Volume Right	0	0	192	0	0	103	371	48				
cSH	768	1700	1700	760	1700	1700	13	0				
Volume to Capacity	0.03	0.27	0.25	0.45	0.30	0.21	41.15	Err				
Queue Length 95th (ft)	2	0	0	59	0	0	Err	Err				
Control Delay (s)	9.8	0.0	0.0	13.6	0.0	0.0	Err	Err				
Lane LOS	A			B			F	F				
Approach Delay (s)	0.3			3.8			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	83.2%			ICU Level of Service			E					
Analysis Period (min)	15											

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1705	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1705	
Volume (vph)	75	857	156	235	907	529	184	40	350	553	52	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	902	164	247	955	557	194	42	368	582	55	71
RTOR Reduction (vph)	0	0	53	0	0	142	0	0	345	0	29	0
Lane Group Flow (vph)	79	902	111	247	955	415	194	42	23	582	97	0
Turn Type	Split	Perm	Split	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	45.6	45.6	45.6	55.4	55.4	55.4	19.0	9.5	9.5	31.5	22.0	
Effective Green, g (s)	46.1	46.1	46.1	55.9	55.9	55.9	19.5	10.0	10.0	32.0	22.5	
Actuated g/C Ratio	0.29	0.29	0.29	0.35	0.35	0.35	0.12	0.06	0.06	0.20	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	510	977	415	587	618	553	216	221	99	687	240	
v/s Ratio Prot	0.04	c0.27		0.15	c0.54		c0.11	0.01		c0.17	0.06	
v/s Ratio Perm			0.08			0.26			0.01			
v/c Ratio	0.15	0.92	0.27	0.42	1.55	0.75	0.90	0.19	0.23	0.85	0.40	
Uniform Delay, d1	42.4	55.2	43.9	39.7	52.0	45.9	69.3	71.2	71.3	61.6	62.6	
Progression Factor	1.00	1.00	1.00	0.84	0.87	0.89	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	13.8	0.3	1.5	250.8	6.2	34.5	0.4	1.2	9.5	1.1	
Delay (s)	42.6	69.0	44.3	34.8	296.2	47.2	103.8	71.6	72.6	71.1	63.7	
Level of Service	D	E	D	C	F	D	F	E	E	E	E	
Approach Delay (s)		63.7			180.7			82.5			69.8	
Approach LOS		E			F			F			E	
Intersection Summary												
HCM Average Control Delay		116.2									F	
HCM Volume to Capacity ratio		1.13										
Actuated Cycle Length (s)		160.0							12.0			
Intersection Capacity Utilization		105.5%									G	
Analysis Period (min)		15										
c Critical Lane Group												

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Flt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3047	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3047	
Volume (vph)	0	1213	546	85	970	0	0	0	0	424	339	702
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1277	575	89	1021	0	0	0	0	446	357	739
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	70	0
Lane Group Flow (vph)	0	1277	438	89	1021	0	0	0	0	446	1026	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases			4									
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	990	
v/s Ratio Prot		c0.36		0.03	c0.29							
v/s Ratio Perm			0.28							0.28	0.34	
v/c Ratio		0.78	0.60	0.42	0.50					0.85	1.32dr	
Uniform Delay, d1		18.0	15.9	36.2	10.2					25.2	27.0	
Progression Factor		1.44	1.58	1.22	1.65					1.00	1.00	
Incremental Delay, d2		1.7	1.6	0.9	0.6					16.0	38.4	
Delay (s)		27.6	26.8	45.0	17.4					41.3	65.4	
Level of Service		C	C	D	B					D	E	
Approach Delay (s)		27.3			19.6				0.0		58.4	
Approach LOS		C			B				A		E	
Intersection Summary												
HCM Average Control Delay			36.0								D	
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			80.0								8.0	
Intersection Capacity Utilization			76.7%								D	
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖↖	↖↖	↖	↖	↖	↖↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.95			0.95	0.95	0.88	1.00	1.00	
Frt	1.00	0.85	1.00	0.99			1.00	1.00	0.85	1.00	0.93	
Flt Protected	1.00	1.00	0.95	1.00			0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	5085	1583	3433	3518			1681	1690	2787	1770	1723	
Flt Permitted	1.00	1.00	0.95	1.00			0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	5085	1583	3433	3518			1681	1690	2787	1770	1723	
Volume (vph)	0	815	822	178	407	17	638	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	858	865	187	428	18	672	19	601	9	9	9
RTOR Reduction (vph)	0	0	645	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	858	220	187	443	0	337	354	124	9	11	0
Turn Type	Prot	Perm	Prot				Split	Perm		Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	17.5	17.5	12.5	34.5			16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0			16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44			0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1539			347	349	575	365	355	
v/s Ratio Prot	c0.17		0.05	c0.13			0.20	c0.21		0.01	c0.01	
v/s Ratio Perm		0.14						0.04				
v/c Ratio	0.75	0.62	0.34	0.29			0.97	1.01	0.22	0.02	0.03	
Uniform Delay, d1	28.9	27.9	29.7	14.5			31.5	31.8	26.4	25.3	25.4	
Progression Factor	1.39	7.46	1.21	1.23			0.98	0.98	2.07	1.00	1.00	
Incremental Delay, d2	2.7	4.8	0.3	0.4			35.4	45.5	0.6	0.1	0.2	
Delay (s)	43.1	213.1	36.2	18.2			66.4	76.6	55.3	25.5	25.5	
Level of Service	D	F	D	B			E	E	E	C	C	
Approach Delay (s)	128.4			23.5			64.1			25.5		
Approach LOS	F			C			E			C		
Intersection Summary												
HCM Average Control Delay		87.0										
HCM Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		80.0							12.0			
Intersection Capacity Utilization		69.3%										
Analysis Period (min)		15										
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↖	→	←	↖	↗	↘
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖↖	↖↖		↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3502		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3502		1770	1583
Volume (vph)	180	1214	766	57	137	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	1278	806	60	144	96
RTOR Reduction (vph)	0	0	5	0	0	71
Lane Group Flow (vph)	189	1278	861	0	144	25
Turn Type	Prot				Perm	
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	9.6	50.5	36.4		20.5	20.5
Effective Green, g (s)	10.1	51.0	36.9		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	433	2256	1615		465	416
v/s Ratio Prot	0.06	c0.36	0.25		c0.08	
v/s Ratio Perm						0.02
v/c Ratio	0.44	0.57	0.53		0.31	0.06
Uniform Delay, d1	32.3	8.2	15.4		23.7	22.1
Progression Factor	0.81	2.31	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.8	1.3		1.7	0.3
Delay (s)	26.7	19.7	16.7		25.4	22.4
Level of Service	C	B	B		C	C
Approach Delay (s)		20.6	16.7		24.2	
Approach LOS		C	B		C	
Intersection Summary						
HCM Average Control Delay			19.6			
HCM Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			80.0			
Intersection Capacity Utilization			47.8%			
Analysis Period (min)			15			
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1745		1770	3527		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1745		1770	3527		1770	3539	1583
Volume (vph)	734	5	108	15	6	9	557	483	11	9	394	607
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	773	5	114	16	6	9	586	508	12	9	415	639
RTOR Reduction (vph)	0	0	85	0	9	0	0	2	0	0	0	539
Lane Group Flow (vph)	387	391	29	0	22	0	586	518	0	9	415	100
Turn Type	Split	Perm	Split	Split	Prot	Prot	Prot	Perm		Prot	Perm	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	19.9	19.9	19.9		3.0		27.1	37.6		1.5	12.0	12.0
Effective Green, g (s)	20.4	20.4	20.4		3.5		27.6	38.1		2.0	12.5	12.5
Actuated g/C Ratio	0.25	0.25	0.25		0.04		0.35	0.48		0.02	0.16	0.16
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	429	430	404		76		611	1680		44	553	247
v/s Ratio Prot	0.23	c0.23			c0.01		c0.33	0.15		0.01	c0.12	
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.90	0.91	0.07		0.29		0.96	0.31		0.20	0.75	0.40
Uniform Delay, d1	28.8	28.9	22.6		37.1		25.6	12.9		38.2	32.3	30.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.08	1.14	3.71
Incremental Delay, d2	21.7	22.7	0.1		2.2		26.2	0.5		1.4	5.8	3.1
Delay (s)	50.6	51.6	22.7		39.2		51.9	13.3		42.7	42.7	115.8
Level of Service	D	D	C		D		D	B		D	D	F
Approach Delay (s)		47.4			39.2		33.7				86.6	
Approach LOS		D			D		C				F	
Intersection Summary												
HCM Average Control Delay		55.9			HCM Level of Service		E					
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)		16.0					
Intersection Capacity Utilization		81.8%			ICU Level of Service		D					
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	942	0	0	668
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	992	0	0	703
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1695	992			992	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1695	992			992	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	102	298			697	
Direction, Lane #						
Volume Total	0	992	703			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.58	0.41			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		52.9%			ICU Level of Service	A
Analysis Period (min)		15				

14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	211	73	45	0	0	222
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	222	77	47	0	0	234
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	47				568	47
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	47				568	47
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				100	77
cM capacity (veh/h)	1560				415	1022
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	299	47	234			
Volume Left	222	0	0			
Volume Right	0	0	234			
cSH	1560	1700	1022			
Volume to Capacity	0.14	0.03	0.23			
Queue Length 95th (ft)	12	0	22			
Control Delay (s)	6.0	0.0	9.6			
Lane LOS	A		A			
Approach Delay (s)	6.0	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			7.0			
Intersection Capacity Utilization			42.6%		ICU Level of Service	A
Analysis Period (min)			15			

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	197	32	13	429	373	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	207	34	14	452	393	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	663	213	426			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	663	213	426			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	47	96	99			
cM capacity (veh/h)	390	792	1129			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	207	34	14	226	226	262 165
Volume Left	207	0	14	0	0	0 0
Volume Right	0	34	0	0	0	0 34
cSH	390	792	1129	1700	1700	1700 1700
Volume to Capacity	0.53	0.04	0.01	0.13	0.13	0.15 0.10
Queue Length 95th (ft)	75	3	1	0	0	0 0
Control Delay (s)	24.3	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	22.2		0.2			0.0
Approach LOS	C					
Intersection Summary						
Average Delay				4.8		
Intersection Capacity Utilization				29.4%		ICU Level of Service A
Analysis Period (min)				15		

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	↖	↗	↖	↗	↖	↗
Lane Configurations	↖	↗	↖	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	299	372	570	285	228	447
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	315	392	600	300	240	471
RTOR Reduction (vph)	0	302	0	173	0	0
Lane Group Flow (vph)	315	90	600	127	240	471
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	6
Permitted Phases	8		2			
Actuated Green, G (s)	14.2	14.2	26.5	26.5	9.5	40.5
Effective Green, g (s)	14.7	14.7	27.0	27.0	10.0	41.0
Actuated g/C Ratio	0.23	0.23	0.42	0.42	0.16	0.64
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	408	365	790	671	278	1199
v/s Ratio Prot	c0.18		c0.32		c0.14	0.25
v/s Ratio Perm		0.06		0.08		
v/c Ratio	0.77	0.25	0.76	0.19	0.86	0.39
Uniform Delay, d1	22.9	20.0	15.6	11.5	26.2	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8	0.4	6.8	0.6	23.1	1.0
Delay (s)	31.7	20.3	22.4	12.1	49.3	6.4
Level of Service	C	C	C	B	D	A
Approach Delay (s)	25.4		18.9		20.9	
Approach LOS	C		B		C	
Intersection Summary						
HCM Average Control Delay		21.5		HCM Level of Service	C	
HCM Volume to Capacity ratio		0.78				
Actuated Cycle Length (s)		63.7		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		69.2%		ICU Level of Service	C	
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	
Volume (vph)	58	539	45	122	584	316	69	17	123	470	48	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	567	47	128	615	333	73	18	129	495	51	109
RTOR Reduction (vph)	0	0	37	0	0	264	0	47	54	0	58	0
Lane Group Flow (vph)	61	567	10	128	615	69	73	31	15	495	102	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	16.1	16.1	4.4	16.1	16.1	4.4	17.1	17.1	24.4	37.1	
Effective Green, g (s)	4.9	16.6	16.6	4.9	16.6	16.6	4.9	17.6	17.6	24.9	37.6	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.22	0.22	0.31	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	734	328	210	734	328	210	344	331	551	786	
v/s Ratio Prot	0.03	c0.16		0.04	c0.17		c0.02	0.02		c0.28	c0.06	
v/s Ratio Perm			0.01			0.04			0.01			
v/c Ratio	0.56	0.77	0.03	0.61	0.84	0.21	0.35	0.09	0.05	0.90	0.13	
Uniform Delay, d1	36.5	29.9	25.3	36.6	30.4	26.3	36.0	24.8	24.6	26.3	12.0	
Progression Factor	1.00	1.00	1.00	0.84	0.52	0.50	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	5.1	0.0	4.1	6.9	0.3	1.0	0.5	0.3	17.3	0.3	
Delay (s)	43.1	35.0	25.3	34.8	22.7	13.5	37.0	25.4	24.8	43.6	12.3	
Level of Service	D	C	C	C	C	B	D	C	C	D	B	
Approach Delay (s)		35.0			21.3			29.1			36.0	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM Average Control Delay		29.1		HCM Level of Service	C							
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	16.0							
Intersection Capacity Utilization		62.2%		ICU Level of Service	B							
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3146	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3146	1441	3433	1863	1583
Volume (vph)	209	805	118	448	672	408	122	228	464	439	210	228
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	220	847	124	472	707	429	128	240	488	462	221	240
RTOR Reduction (vph)	0	0	84	0	0	285	0	187	224	0	0	197
Lane Group Flow (vph)	220	847	40	472	707	144	128	275	42	462	221	43
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	25.5	25.5	11.5	25.0	25.0	11.3	12.2	12.2	12.8	13.7	13.7
Effective Green, g (s)	12.5	26.0	26.0	12.0	25.5	25.5	11.8	12.7	12.7	13.3	14.2	14.2
Actuated g/C Ratio	0.16	0.32	0.32	0.15	0.32	0.32	0.15	0.16	0.16	0.17	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	1653	514	515	1128	505	261	499	229	571	331	281
v/s Ratio Prot	c0.12	0.17		c0.14	c0.20		0.07	0.09		c0.13	c0.12	
v/s Ratio Perm			0.03			0.09			0.03			0.03
v/c Ratio	0.79	0.51	0.08	0.92	0.63	0.28	0.49	0.55	0.18	0.81	0.67	0.15
Uniform Delay, d1	32.5	21.9	18.7	33.5	23.2	20.4	31.3	31.0	29.2	32.1	30.7	27.8
Progression Factor	0.71	0.70	0.97	0.74	0.61	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.2	0.7	0.2	17.6	2.1	1.1	1.5	1.3	0.4	8.3	5.0	0.3
Delay (s)	32.4	16.1	18.4	42.4	16.3	18.9	32.8	32.3	29.6	40.4	35.7	28.1
Level of Service	C	B	B	D	B	B	C	C	C	D	D	C
Approach Delay (s)		19.3			24.7			31.5			36.1	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.9										
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		67.3%										
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.95		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4843		1770	3539	1583		1653		1681	1681	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.92		0.74	0.74	1.00
Satd. Flow (perm)		4843		1770	3539	1583		1541		1312	1312	1583
Volume (vph)	0	1165	542	78	1199	234	6	0	17	692	0	323
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1226	571	82	1262	246	6	0	18	728	0	340
RTOR Reduction (vph)	0	97	0	0	0	0	0	12	0	0	0	32
Lane Group Flow (vph)	0	1700	0	82	1262	246	0	12	0	364	364	308
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free		2					6
Actuated Green, G (s)		36.1		4.9	45.5	80.0		25.5		25.5	25.5	25.5
Effective Green, g (s)		36.6		5.4	46.0	80.0		26.0		26.0	26.0	26.0
Actuated g/C Ratio		0.46		0.07	0.58	1.00		0.32		0.32	0.32	0.32
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2216		119	2035	1583		501		426	426	514
v/s Ratio Prot		c0.35		0.05	c0.36							
v/s Ratio Perm						0.16		0.01		c0.28	0.28	0.19
v/c Ratio		0.77		0.69	0.62	0.16		0.02		0.85	0.85	0.60
Uniform Delay, d1		18.1		36.5	11.2	0.0		18.4		25.2	25.2	22.6
Progression Factor		0.44		1.27	0.69	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		2.1		12.1	1.1	0.2		0.0		15.3	15.3	1.9
Delay (s)		10.0		58.4	8.8	0.2		18.4		40.5	40.5	24.5
Level of Service		B		E	A	A		B		D	D	C
Approach Delay (s)		10.0			10.1			18.4			35.4	
Approach LOS		B			B			B			D	
Intersection Summary												
HCM Average Control Delay		16.1								B		
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0								12.0		
Intersection Capacity Utilization		74.8%								D		
Analysis Period (min)		15										
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	
Flt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.82	
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1500	
Volume (vph)	19	1352	504	0	984	343	523	0	376	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1423	531	0	1036	361	551	0	396	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	3	0	2	0
Lane Group Flow (vph)	20	1423	531	0	1036	361	551	195	195	0	16	0
Turn Type	Prot	Free			Free	Perm		Perm	Perm			
Protected Phases	7	4			8			2			6	
Permitted Phases		Free			Free	2		2		6		
Actuated Green, G (s)	2.2	36.1	80.0		29.4	80.0	34.9	34.9	34.9		34.9	
Effective Green, g (s)	2.7	36.6	80.0		29.9	80.0	35.4	35.4	35.4		35.4	
Actuated g/C Ratio	0.03	0.46	1.00		0.37	1.00	0.44	0.44	0.44		0.44	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	2932	1583		1901	1583	615	666	666		664	
v/s Ratio Prot	0.01	c0.22			c0.20			0.13				
v/s Ratio Perm			0.34			0.23	c0.40		0.13		0.01	
v/c Ratio	0.33	0.49	0.34		0.54	0.23	0.90	0.29	0.29		0.02	
Uniform Delay, d1	37.8	15.1	0.0		19.7	0.0	20.6	14.3	14.3		12.6	
Progression Factor	1.03	1.02	1.00		0.70	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.9	0.3	0.3		0.7	0.2	15.6	0.2	0.2		0.0	
Delay (s)	41.0	15.8	0.3		14.5	0.2	36.2	14.5	14.5		12.6	
Level of Service	D	B	A		B	A	D	B	B		B	
Approach Delay (s)		11.9			10.8			27.1			12.6	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay		14.9			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		58.8%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4887		1610	3339	1583	1610	3380	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4887		1610	3339	1583	1610	3380	1583
Volume (vph)	269	927	547	195	764	268	390	348	317	180	313	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	976	576	205	804	282	411	366	334	189	329	182
RTOR Reduction (vph)	0	0	373	0	75	0	0	0	251	0	0	150
Lane Group Flow (vph)	283	976	203	205	1011	0	250	527	83	167	351	32
Turn Type	Prot		Perm		Prot		Split		Perm		Split	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	22.5	22.5	9.8	19.8		16.0	16.0	16.0	13.7	13.7	13.7
Effective Green, g (s)	13.0	23.0	23.0	10.3	20.3		16.5	16.5	16.5	14.2	14.2	14.2
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.25		0.21	0.21	0.21	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1017	455	228	1240		332	689	326	286	600	281
v/s Ratio Prot	0.08	c0.28		0.12	c0.21		0.16	c0.16		0.10	c0.10	
v/s Ratio Perm			0.13						0.05			0.02
v/c Ratio	0.51	0.96	0.45	0.90	0.82		0.75	0.76	0.26	0.58	0.58	0.11
Uniform Delay, d1	30.6	28.0	23.3	34.3	28.1		29.8	29.9	26.6	30.2	30.2	27.6
Progression Factor	0.58	0.58	1.27	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	18.9	2.9	33.4	6.0		9.3	5.1	0.4	3.0	1.5	0.2
Delay (s)	18.5	35.1	32.4	67.7	34.1		39.1	35.0	27.0	33.2	31.7	27.8
Level of Service	B	D	C	E	C		D	C	C	C	C	C
Approach Delay (s)		31.7			39.4			33.5			31.0	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay			34.0			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			73.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	150	774	324	115	510	133	316	511	102	276	529	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	815	341	121	537	140	333	538	107	291	557	242
RTOR Reduction (vph)	0	66	0	0	0	106	0	0	70	0	0	183
Lane Group Flow (vph)	158	1090	0	121	537	34	333	538	37	291	557	59
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.5	16.5		5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	17.0		6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	822		152	859	384	354	639	543	177	452	384
v/s Ratio Prot	c0.09	c0.32		0.07	0.15		c0.19	0.29		c0.16	c0.30	
v/s Ratio Perm					0.02			0.02			0.04	
v/c Ratio	1.04	1.33		0.80	0.63	0.09	0.94	0.84	0.07	1.64	1.23	0.15
Uniform Delay, d1	32.0	26.5		31.4	23.7	20.5	27.6	21.2	15.5	31.5	26.5	20.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.8	155.2		24.3	1.4	0.1	32.7	12.7	0.2	313.8	122.6	0.8
Delay (s)	115.8	181.7		55.7	25.1	20.6	60.3	34.0	15.7	345.3	149.1	21.7
Level of Service	F	F		E	C	C	E	C	B	F	F	C
Approach Delay (s)		173.8			28.9			41.0			173.2	
Approach LOS		F			C			D			F	
Intersection Summary												
HCM Average Control Delay		114.9										F
HCM Volume to Capacity ratio		1.23										
Actuated Cycle Length (s)		70.0							16.0			
Intersection Capacity Utilization		96.8%										F
Analysis Period (min)		15										
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3516		1770	3539	1583	1770	1658	1583	1770	1653	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3516		1770	3539	1583	1770	1658	1583	1770	1653	1583
Volume (vph)	107	720	33	62	890	320	48	23	63	562	35	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	758	35	65	937	337	51	24	66	592	37	111
RTOR Reduction (vph)	0	4	0	0	0	118	0	61	0	0	58	0
Lane Group Flow (vph)	113	789	0	65	937	219	51	29	0	592	90	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.6	21.9		4.4	20.7	20.7	3.3	6.3		39.4	42.4	
Effective Green, g (s)	6.1	22.4		4.9	21.2	21.2	3.8	6.8		39.9	42.9	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	875		96	834	373	75	125		785	788	
v/s Ratio Prot	0.06	c0.22		0.04	c0.26		c0.03	0.02		c0.33	c0.05	
v/s Ratio Perm					0.14							
v/c Ratio	0.94	0.90		0.68	1.12	0.59	0.68	0.23		0.75	0.11	
Uniform Delay, d1	41.8	32.7		41.8	34.4	30.5	42.5	39.1		20.9	13.0	
Progression Factor	1.00	1.00		0.67	0.61	0.26	1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.8	14.3		15.3	69.4	5.9	22.4	1.0		4.1	0.1	
Delay (s)	105.6	47.0		43.4	90.2	13.9	64.9	40.1		25.1	13.1	
Level of Service	F	D		D	F	B	E	D		C	B	
Approach Delay (s)		54.3			68.7			49.1			22.7	
Approach LOS		D			E			D			C	
Intersection Summary												
HCM Average Control Delay		52.8										D
HCM Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		90.0								20.0		
Intersection Capacity Utilization		80.1%										D
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps

2020 + Alternative H

Graton Rancheria Casino & Hotel

PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Flt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	969	376	119	1004	0	0	0	0	626	0	268
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1020	396	125	1057	0	0	0	0	659	0	282
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	68	0
Lane Group Flow (vph)	0	1020	308	125	1057	0	0	0	0	659	214	0
Turn Type		Perm	Prot							Prot		
Protected Phases		4	3	8						1	6	
Permitted Phases			4									
Actuated Green, G (s)		33.5	33.5	14.5	52.5					28.5	28.5	
Effective Green, g (s)		34.0	34.0	15.0	53.0					29.0	29.0	
Actuated g/C Ratio		0.38	0.38	0.17	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1337	598	295	2084					1106	510	
v/s Ratio Prot		c0.29		0.07	c0.30					c0.19	0.13	
v/s Ratio Perm			0.19									
v/c Ratio		0.76	0.51	0.42	0.51					0.60	0.42	
Uniform Delay, d1		24.5	21.6	33.6	10.8					25.6	23.9	
Progression Factor		0.51	0.44	1.24	1.61					1.00	1.00	
Incremental Delay, d2		2.6	1.9	0.9	0.8					0.9	2.5	
Delay (s)		15.1	11.4	42.7	18.3					26.5	26.4	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		14.1			20.9			0.0			26.4	
Approach LOS		B			C			A			C	
Intersection Summary												
HCM Average Control Delay		19.6			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		66.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps

2020 + Alternative H

Graton Rancheria Casino & Hotel

PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Flt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1594	0	0	700	423	255
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1678	0	0	737	445	268
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1678	0	0	737	445	254
Turn Type					Perm	
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	61.5			61.5	19.5	19.5
Effective Green, g (s)	62.0			62.0	20.0	20.0
Actuated g/C Ratio	0.69			0.69	0.22	0.22
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2438			2438	763	352
v/s Ratio Prot	c0.47			0.21	0.13	
v/s Ratio Perm						c0.16
v/c Ratio	0.69			0.30	0.58	0.72
Uniform Delay, d1	8.3			5.5	31.3	32.4
Progression Factor	0.28			1.00	1.00	1.00
Incremental Delay, d2	1.1			0.3	1.1	7.1
Delay (s)	3.4			5.8	32.4	39.5
Level of Service	A			A	C	D
Approach Delay (s)	3.4			5.8	35.1	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			11.2		HCM Level of Service	B
HCM Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			66.5%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	4	9	18	24	222	8	780	24	119	677	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	4	9	19	25	234	8	821	25	125	713	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)							5					
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1524	1830	360	1456	1808	411	720			846		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1524	1830	360	1456	1808	411	720			846		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	61	93	99	74	61	60	99			84		
cM capacity (veh/h)	30	63	637	74	65	590	877			786		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	25	278	8	411	411	25	125	475	245			
Volume Left	12	19	8	0	0	0	125	0	0			
Volume Right	9	234	0	0	0	25	0	0	7			
cSH	54	433	877	1700	1700	1700	786	1700	1700			
Volume to Capacity	0.47	0.64	0.01	0.24	0.24	0.01	0.16	0.28	0.14			
Queue Length 95th (ft)	44	110	1	0	0	0	14	0	0			
Control Delay (s)	120.3	32.3	9.1	0.0	0.0	0.0	10.4	0.0	0.0			
Lane LOS	F	D	A				B					
Approach Delay (s)	120.3	32.3	0.1				1.5					
Approach LOS	F	D										
Intersection Summary												
Average Delay			6.7									
Intersection Capacity Utilization			48.6%			ICU Level of Service			A			
Analysis Period (min)			15									

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	142	4	7	261	2	2	0	2	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	149	4	7	275	2	2	0	2	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	277			154				445	445	152	446	276
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			154				445	445	152	446	276
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0
p0 queue free %	100			99				100	100	100	100	100
cM capacity (veh/h)	1286			1427				520	505	895	519	763
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	155	284	4	2								
Volume Left	1	7	2	1								
Volume Right	4	2	2	0								
cSH	1286	1427	658	511								
Volume to Capacity	0.00	0.01	0.01	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.2	10.5	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.5	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			28.6%			ICU Level of Service			A			
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	129	2	4	275	8	1	10	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	136	2	4	289	8	1	11	0	3	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	298			138			445	447	137	448	444	294
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	298			138			445	447	137	448	444	294
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1263			1446			520	504	912	511	506	746
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	302	12	5								
Volume Left	2	4	1	3								
Volume Right	2	8	0	1								
cSH	1263	1446	505	544								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.3	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.3	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		27.2%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	153	10	4	336	13	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	161	11	4	354	14	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		528	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		528	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1405		509	878
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	358	23			
Volume Left	0	4	14			
Volume Right	11	0	9			
cSH	1700	1405	615			
Volume to Capacity	0.10	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.1	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		30.9%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	150	16	17	244	0	100	0	29	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	158	17	18	257	0	105	0	31	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	257			175			459	459	166	489	467	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			175			459	459	166	489	467	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			79	100	97	100	100	100
cM capacity (veh/h)	1308			1402			507	492	878	467	487	782
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	175	275	136	0								
Volume Left	0	18	105	0								
Volume Right	17	0	31	0								
cSH	1308	1402	561	1700								
Volume to Capacity	0.00	0.01	0.24	0.00								
Queue Length 95th (ft)	0	1	24	0								
Control Delay (s)	0.0	0.6	13.5	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.6	13.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization		40.0%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	137	32	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	144	34	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			178		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1398		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	178	247	34			
Volume Left	0	0	34			
Volume Right	34	0	0			
cSH	1700	1398	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	79	902	164	247	955	557	194	42	368	582	126
v/c Ratio	0.15	0.92	0.35	0.42	1.54	0.80	0.90	0.19	0.83	0.85	0.47
Control Delay	42.7	70.5	25.9	35.8	282.8	32.3	108.2	71.1	22.6	73.6	52.4
Queue Delay	0.0	28.0	0.0	7.0	92.7	26.1	0.0	0.0	5.8	381.0	0.0
Total Delay	42.7	98.5	25.9	42.8	375.5	58.4	108.2	71.1	28.4	454.6	52.4
Queue Length 50th (ft)	61	497	78	185	~1532	288	203	22	0	300	90
Queue Length 95th (ft)	106	#596	154	m220m	#1640	m368	#352	43	110	#474	163
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	531	1017	484	587	619	695	221	376	497	686	269
Starvation Cap Reductn	0	0	0	287	73	154	0	0	0	0	0
Spillback Cap Reductn	0	158	0	0	0	0	0	0	83	371	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	1.05	0.34	0.82	1.75	1.03	0.88	0.11	0.89	1.85	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1277	575	89	1021	446	1096
v/c Ratio	0.76	0.65	0.35	0.50	0.85	1.32dr
Control Delay	27.3	15.7	45.7	17.7	43.0	62.5
Queue Delay	51.4	4.5	0.0	0.2	0.0	94.7
Total Delay	78.7	20.2	45.7	17.9	43.0	157.2
Queue Length 50th (ft)	442	183	21	244	226	~307
Queue Length 95th (ft)	m584	m319	m28	m223	#405	#437
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	886	257	2035	523	1061
Starvation Cap Reductn	527	235	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	190
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.88	0.35	0.60	0.85	1.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	858	865	187	446	337	354	601	9	18
v/c Ratio	0.75	0.86	0.34	0.29	0.97	1.01	0.57	0.02	0.05
Control Delay	43.2	22.4	37.7	18.2	69.4	79.6	7.3	25.7	18.8
Queue Delay	0.0	18.6	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	43.2	40.9	37.7	18.2	69.4	79.6	7.7	25.7	18.8
Queue Length 50th (ft)	204	255	52	112	133	~144	10	4	4
Queue Length 95th (ft)	187	200	85	156	m#256	m#277	m40	16	21
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	1001	558	1542	347	349	1052	365	363
Starvation Cap Reductn	0	152	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	127	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	1.02	0.34	0.29	0.97	1.01	0.65	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	189	1278	866	144	96
v/c Ratio	0.43	0.57	0.53	0.31	0.20
Control Delay	28.2	20.0	17.1	25.9	6.6
Queue Delay	0.0	1.9	0.0	0.0	0.0
Total Delay	28.2	21.8	17.1	25.9	6.6
Queue Length 50th (ft)	58	326	154	58	0
Queue Length 95th (ft)	m70	332	221	106	34
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1621	465	486
Starvation Cap Reductn	0	773	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.86	0.53	0.31	0.20
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	387	391	114	31	586	520	9	415	639
v/c Ratio	0.90	0.91	0.23	0.20	1.10	0.26	0.06	0.50	0.74
Control Delay	55.9	56.7	6.4	29.4	99.9	12.0	36.6	33.8	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	55.9	56.7	6.4	29.4	99.9	12.0	36.6	33.8	12.1
Queue Length 50th (ft)	194	196	0	10	~339	51	5	112	33
Queue Length 95th (ft)	#360	#363	37	35	#531	147	m6	m#143	m78
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	500	183	531	1964	177	835	862
Starvation Cap Reductn	0	0	0	0	0	0	0	0	36
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.88	0.23	0.17	1.10	0.26	0.05	0.50	0.77
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	315	392	600	300	240	471
v/c Ratio	0.77	0.59	0.76	0.36	0.86	0.39
Control Delay	37.5	6.7	24.1	3.1	58.8	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	6.7	24.1	3.1	58.8	6.9
Queue Length 50th (ft)	115	0	197	0	95	79
Queue Length 95th (ft)	#221	60	#359	40	#213	129
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	685	790	844	278	1199
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.57	0.76	0.36	0.86	0.39
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	61	567	47	128	615	333	73	78	69	495	160
v/c Ratio	0.46	0.77	0.13	0.50	0.84	0.56	0.28	0.18	0.17	0.93	0.18
Control Delay	47.1	38.0	9.3	35.7	26.0	5.0	38.1	11.7	8.3	54.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	38.0	9.3	35.7	26.0	5.0	38.1	11.7	8.3	54.9	5.8
Queue Length 50th (ft)	30	141	0	20	117	0	18	7	0	239	14
Queue Length 95th (ft)	67	197	26	m43	#228	6	38	43	33	#424	48
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	373	257	752	599	257	425	417	531	879
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.75	0.13	0.50	0.82	0.56	0.28	0.18	0.17	0.93	0.18
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	220	847	124	472	707	429	128	462	266	462	221	240
v/c Ratio	0.79	0.51	0.21	0.92	0.63	0.54	0.49	0.67	0.59	0.81	0.67	0.50
Control Delay	38.3	16.2	4.6	47.1	16.6	4.6	40.8	20.8	9.6	48.0	40.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	16.2	4.6	47.1	16.6	4.6	40.8	20.8	9.6	48.0	40.5	8.0
Queue Length 50th (ft)	69	83	8	131	142	36	60	60	0	116	103	0
Queue Length 95th (ft)	m106	m93	m13	#211	167	48	#136	104	64	#237	169	56
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1653	598	515	1126	790	260	843	516	572	396	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.51	0.21	0.92	0.63	0.54	0.49	0.55	0.52	0.81	0.56	0.46
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1797	82	1262	246	24	364	364	340
v/c Ratio	0.76	0.56	0.62	0.16	0.05	0.85	0.85	0.62
Control Delay	9.8	58.3	9.6	0.2	9.5	44.6	44.6	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	58.3	9.6	0.2	9.5	44.6	44.6	24.3
Queue Length 50th (ft)	146	45	128	0	2	165	165	114
Queue Length 95th (ft)	357	m#78	m140	m0	17	#311	#311	197
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2363	146	2034	1583	572	476	476	604
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.56	0.62	0.16	0.04	0.76	0.76	0.56
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	20	1423	531	1036	361	551	198	198	18
v/c Ratio	0.15	0.49	0.34	0.50	0.23	0.89	0.30	0.30	0.03
Control Delay	37.6	17.3	0.3	15.3	0.2	38.1	13.6	13.6	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	17.3	0.3	15.3	0.2	38.1	13.6	13.6	8.6
Queue Length 50th (ft)	10	161	0	84	0	231	58	58	4
Queue Length 95th (ft)	m13	212	m0	134	m0	342	92	92	13
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	2928	1583	2070	1583	730	792	792	796
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.49	0.34	0.50	0.23	0.75	0.25	0.25	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	283	976	576	205	1086	250	527	334	167	351	182
v/c Ratio	0.51	0.96	0.70	0.90	0.82	0.76	0.77	0.58	0.58	0.58	0.42
Control Delay	21.0	37.5	9.4	78.6	33.5	45.9	38.3	8.8	38.3	33.9	7.8
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	37.5	10.0	78.6	33.5	45.9	38.3	8.8	38.3	33.9	7.8
Queue Length 50th (ft)	65	271	205	104	173	128	136	7	84	89	0
Queue Length 95th (ft)	70	#368	92	#264	#274	#245	193	75	147	128	50
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1017	828	229	1318	342	710	585	342	718	480
Starvation Cap Reductn	0	0	63	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.96	0.75	0.90	0.82	0.73	0.74	0.57	0.49	0.49	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	1156	121	537	140	333	538	107	291	557	242
v/c Ratio	1.04	1.30	0.80	0.63	0.29	0.94	0.84	0.17	1.64	1.23	0.43
Control Delay	120.6	169.6	69.1	27.4	6.2	66.0	35.8	4.6	340.2	150.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.6	169.6	69.1	27.4	6.2	66.0	35.8	4.6	340.2	150.1	6.0
Queue Length 50th (ft)	~75	~331	52	108	0	142	210	0	~186	~303	0
Queue Length 95th (ft)	#183	#452	#138	157	39	#290	#378	29	#325	#482	51
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	887	152	859	490	354	639	613	177	452	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.30	0.80	0.63	0.29	0.94	0.84	0.17	1.64	1.23	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	793	65	937	337	51	90	592	148
v/c Ratio	0.93	0.81	0.55	1.04	0.65	0.43	0.44	0.77	0.17
Control Delay	111.2	38.5	44.2	60.8	9.8	52.2	21.6	31.9	5.7
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.2	39.0	44.2	60.8	9.8	52.2	21.6	31.9	5.7
Queue Length 50th (ft)	65	226	37	~311	6	28	13	286	12
Queue Length 95th (ft)	#171	#331	m#81	#415	33	65	56	#513	47
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	121	985	118	904	519	118	367	767	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	30	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.83	0.55	1.04	0.65	0.43	0.25	0.77	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1020	396	125	1057	659	282
v/c Ratio	0.76	0.58	0.42	0.51	0.60	0.49
Control Delay	15.3	8.4	46.7	18.6	28.3	18.7
Queue Delay	1.1	0.4	0.0	0.3	0.0	0.0
Total Delay	16.4	8.8	46.7	18.9	28.3	18.7
Queue Length 50th (ft)	152	69	70	253	160	79
Queue Length 95th (ft)	184	m99	m125	314	216	154
Internal Link Dist (ft)		350		370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1337	686	295	2084	1106	579
Starvation Cap Reductn	134	60	0	428	0	0
Spillback Cap Reductn	17	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.63	0.42	0.64	0.60	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H
PM Peak

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1678	737	445	268
v/c Ratio	0.69	0.30	0.58	0.73
Control Delay	3.9	6.7	33.5	41.4
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	3.9	6.7	33.5	41.4
Queue Length 50th (ft)	35	74	117	133
Queue Length 95th (ft)	239	137	144	192
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2438	2438	1221	574
Starvation Cap Reductn	62	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.30	0.36	0.47
Intersection Summary				

**NEAR-TERM 2008 + VARIANT H-SUB1
TRAFFIC CONDITIONS
(SYNCHRO)**

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		Free			Free			Stop			Stop	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	132	129	156	181	8	96	19	129	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	139	136	164	191	8	101	20	136	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	199			275			767	755	207	897	819	195
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	199			275			767	755	207	897	819	195
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			87			63	93	84	94	96	99
cM capacity (veh/h)	1373			1288			274	292	834	186	269	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	285	363	257	32								
Volume Left	11	164	101	11								
Volume Right	136	8	136	11								
cSH	1373	1288	428	292								
Volume to Capacity	0.01	0.13	0.60	0.11								
Queue Length 95th (ft)	1	11	95	9								
Control Delay (s)	0.3	4.4	25.2	18.8								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.3	4.4	25.2	18.8								
Approach LOS			D	C								
Intersection Summary												
Average Delay			9.3									
Intersection Capacity Utilization			64.0%		ICU Level of Service				B			
Analysis Period (min)			15									

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		Free			Free			Stop			Stop	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	198	57	481	323	25	22	19	441	17	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	208	60	506	340	26	23	20	464	18	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	366			268			1638	1649	238	2110	1666	353
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			268			1638	1649	238	2110	1666	353
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			61			56	66	42	0	95	100
cM capacity (veh/h)	1192			1295			53	59	801	8	58	691
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	284	873	507	22								
Volume Left	16	506	23	18								
Volume Right	60	26	464	1								
cSH	1192	1295	375	10								
Volume to Capacity	0.01	0.39	1.35	2.25								
Queue Length 95th (ft)	1	47	608	94								
Control Delay (s)	0.6	7.5	203.9	1325.1								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.6	7.5	203.9	1325.1								
Approach LOS			F	F								
Intersection Summary												
Average Delay			82.7									
Intersection Capacity Utilization			98.8%		ICU Level of Service				F			
Analysis Period (min)			15									

6: Wilfred Avenue &
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	11	587	59	82	802	23	21	14	75	14	2	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	618	62	86	844	24	22	15	79	15	2	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)				630								
pX, platoon unblocked	0.67						0.67	0.67		0.67	0.67	0.67
vC, conflicting volume	868			680			1708	1713	649	1787	1732	856
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	804			680			2057	2064	649	2174	2092	786
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			91			4	55	83	0	93	98
cM capacity (veh/h)	550			912			23	32	470	11	31	263
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	692	955	116	23								
Volume Left	12	86	22	15								
Volume Right	62	24	79	6								
cSH	550	912	73	16								
Volume to Capacity	0.02	0.09	1.58	1.42								
Queue Length 95th (ft)	2	8	244	85								
Control Delay (s)	0.6	2.5	413.2	709.3								
Lane LOS	A	A	F	F								
Approach Delay (s)	0.6	2.5	413.2	709.3								
Approach LOS		F	F									
Intersection Summary												
Average Delay		37.6										
Intersection Capacity Utilization		99.7%		ICU Level of Service			F					
Analysis Period (min)		15										







































7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.97	1.00	1.00
Frt	0.99	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.93	0.93
Flt Protected	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1831	1681	1770	1583	1770	3539	1583	3433	1739	3433	1739	1739
Flt Permitted	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1831	1681	1770	1583	1770	3539	1583	3433	1739	3433	1739	1739
Volume (vph)	48	561	67	180	632	541	172	154	267	425	128	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	51	591	71	189	665	569	181	162	281	447	135	107
RTOR Reduction (vph)	0	3	0	0	0	212	0	0	258	0	18	0
Lane Group Flow (vph)	0	710	0	189	665	357	181	162	23	447	224	0
Turn Type	Split			Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8	5	2		1	6		
Permitted Phases						8			2			
Actuated Green, G (s)	48.5			53.5	53.5	53.5	18.6	12.6	12.6	27.4	21.4	
Effective Green, g (s)	49.0			54.0	54.0	54.0	19.1	13.1	13.1	27.9	21.9	
Actuated g/C Ratio	0.31			0.34	0.34	0.34	0.12	0.08	0.08	0.17	0.14	
Clearance Time (s)	4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	561			567	597	534	211	290	130	599	238	
v/s Ratio Prot	c0.39			0.11	c0.38		c0.10	0.05		0.13	c0.13	
v/s Ratio Perm						0.23		0.01				
v/c Ratio	1.27			0.33	1.11	0.67	0.86	0.56	0.18	0.75	0.94	
Uniform Delay, d1	55.5			39.6	53.0	45.3	69.1	70.7	68.4	62.7	68.4	
Progression Factor	1.00			0.88	0.91	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	133.4			1.3	68.9	5.3	27.4	2.3	0.7	5.0	42.0	
Delay (s)	188.9			35.9	117.1	50.6	96.5	73.0	69.1	64.6	106.8	
Level of Service	F			D	F	D	F	E	E	E	F	
Approach Delay (s)	188.9			79.7			78.1			79.4		
Approach LOS	F			E			E			E		
Intersection Summary												
HCM Average Control Delay		101.9				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.11										
Actuated Cycle Length (s)		160.0				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		105.3%				ICU Level of Service		G				
Analysis Period (min)		15										
c Critical Lane Group												













10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		  	  			  	  	  	  	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3392		1681	1711	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3392		1681	1711	2787	1770	1814	
Volume (vph)	0	497	603	409	303	116	560	107	572	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	523	635	431	319	122	589	113	602	44	43	9
RTOR Reduction (vph)	0	0	492	0	41	0	0	0	478	0	7	0
Lane Group Flow (vph)	0	523	143	431	400	0	342	360	124	44	45	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	17.5	17.5	12.5	34.5			16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	18.0	13.0	35.0			16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.22	0.16	0.44			0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	356	558	1484			347	353	575	365	374	
v/s Ratio Prot	c0.10		c0.13	0.12			0.20	c0.21		c0.02	0.02	
v/s Ratio Perm		0.09						0.04				
w/c Ratio	0.46	0.40	0.77	0.27			0.99	1.02	0.22	0.12	0.12	
Uniform Delay, d1	26.8	26.4	32.1	14.3			31.6	31.8	26.4	25.8	25.8	
Progression Factor	1.46	9.41	1.19	1.24			1.01	1.00	2.32	0.86	0.85	
Incremental Delay, d2	1.1	2.9	6.1	0.4			38.3	46.4	0.6	0.7	0.7	
Delay (s)	40.3	251.4	44.2	18.2			70.2	78.3	62.0	22.9	22.5	
Level of Service	D	F	D	B			E	E	E	C	C	
Approach Delay (s)	156.1			31.0			68.6			22.7		
Approach LOS	F			C			E			C		
Intersection Summary												
HCM Average Control Delay	87.3			HCM Level of Service				F				
HCM Volume to Capacity ratio	0.58											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	62.3%			ICU Level of Service				B				
Analysis Period (min)	15											
c Critical Lane Group												

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Flt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	759	3	40	8	3	5	514	475	2	7	408	639
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	799	3	42	8	3	5	541	500	2	7	429	673
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	557
Lane Group Flow (vph)	400	402	11	0	11	0	541	501	0	7	429	116
Turn Type	Split		Perm		Split		Prot			Prot		Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.1	20.1	20.1		1.5		27.1	38.9		1.5	13.3	13.3
Effective Green, g (s)	20.6	20.6	20.6		2.0		27.6	39.4		2.0	13.8	13.8
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	433	434	408		44		611	1742		44	610	273
v/s Ratio Prot	0.24	c0.24			c0.01		c0.31	0.14		0.00	c0.12	
v/s Ratio Perm			0.01									0.07
w/c Ratio	0.92	0.93	0.03		0.25		0.89	0.29		0.16	0.70	0.43
Uniform Delay, d1	28.9	29.0	22.2		38.3		24.7	12.0		38.2	31.2	29.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.28	1.13	5.55
Incremental Delay, d2	25.3	25.6	0.0		3.0		14.4	0.4		1.1	4.5	3.2
Delay (s)	54.2	54.6	22.2		41.3		39.1	12.4		49.9	39.7	167.2
Level of Service	D	D	C		D		D	B		D	D	F
Approach Delay (s)	52.8				41.3		26.3			117.2		
Approach LOS	D				D		C			F		
Intersection Summary												
HCM Average Control Delay	67.3			HCM Level of Service				E				
HCM Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	81.4%			ICU Level of Service				D				
Analysis Period (min)	15											
c Critical Lane Group												

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	0.90
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	1668
Satd. Flow (perm)	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Volume (vph)	50	600	36	202	575	396	64	19	154	526	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	417	67	20	162	554	45	104
RTOR Reduction (vph)	0	0	29	0	0	309	0	63	69	0	59	0
Lane Group Flow (vph)	53	632	9	213	605	108	67	34	16	554	90	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.0	18.0	5.5	20.2	20.2	4.4	14.1	14.1	24.4	34.1	
Effective Green, g (s)	3.8	18.5	18.5	6.0	20.7	20.7	4.9	14.6	14.6	24.9	34.6	
Actuated g/C Ratio	0.05	0.23	0.23	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	257	916	410	210	285	274	551	721	
v/s Ratio Prot	0.03	c0.18		c0.06	0.17		c0.02	c0.02		c0.31	0.05	
v/s Ratio Perm			0.01			0.07			0.01			
v/c Ratio	0.63	0.77	0.02	0.83	0.66	0.26	0.32	0.12	0.06	1.01	0.12	
Uniform Delay, d1	37.4	28.8	23.8	36.5	26.5	23.6	36.0	27.3	27.0	27.6	13.6	
Progression Factor	1.00	1.00	1.00	0.96	0.51	0.58	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	13.3	1.2	0.2	0.9	0.9	0.4	39.7	0.4	
Delay (s)	51.8	33.3	23.8	48.2	14.7	13.9	36.8	28.2	27.4	67.2	14.0	
Level of Service	D	C	C	D	B	B	D	C	C	E	B	
Approach Delay (s)		34.2			20.2			30.2			56.0	
Approach LOS		C			C			C			E	
Intersection Summary												
HCM Average Control Delay		33.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		68.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85	1.00	0.98	0.98
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00	0.96	0.96	0.96
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504	1748	1748	1748
Satd. Flow (perm)	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00	0.84	0.84	0.84
Volume (vph)	17	1640	273	0	995	350	536	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1726	287	0	1047	368	564	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1726	287	0	1047	368	564	160	160	0	16	0
Turn Type	Prot	Free	Free	Free	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	7	4		8		2		2		6		6
Permitted Phases			Free		Free	2		2		6		6
Actuated Green, G (s)	2.2	35.5	80.0		28.8	80.0	35.5	35.5	35.5	35.5		35.5
Effective Green, g (s)	2.7	36.0	80.0		29.3	80.0	36.0	36.0	36.0	36.0		36.0
Actuated g/C Ratio	0.03	0.45	1.00		0.37	1.00	0.45	0.45	0.45	0.45		0.45
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	60	2884	1583		1862	1583	625	677	677	684		684
v/s Ratio Prot	0.01	c0.27			0.21		0.11					
v/s Ratio Perm			0.18			0.23	c0.41		0.11			0.01
v/c Ratio	0.30	0.60	0.18		0.56	0.23	0.90	0.24	0.24	0.02		0.02
Uniform Delay, d1	37.7	16.6	0.0		20.2	0.0	20.4	13.5	13.5	12.2		12.2
Progression Factor	1.03	1.05	1.00		0.65	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.6	0.5	0.1		0.9	0.3	16.3	0.2	0.2	0.0		0.0
Delay (s)	40.4	17.9	0.1		14.0	0.3	36.7	13.7	13.7	12.2		12.2
Level of Service	D	B	A		B	A	D	B	B	B		B
Approach Delay (s)		15.6			10.4		28.3			12.2		12.2
Approach LOS		B			B		C			B		B
Intersection Summary												
HCM Average Control Delay		16.5			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		63.8%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1147	545	141	781	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1207	574	148	822	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	38	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1207	179	148	963	0	226	475	47	107	242	29
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1106	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.34		0.08	c0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	1.09	0.36	0.60	0.67		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	27.5	21.3	32.4	25.1		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.53	0.50	1.68	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	53.8	1.8	4.1	2.6		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	17.0	67.5	37.7	36.5	27.7		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	B	E	D	D	C		D	C	C	C	C	C
Approach Delay (s)		52.2			28.8			32.7			31.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			40.2			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			71.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

**CUMULATIVE 2020 + VARIANT H-SUB1
TRAFFIC CONDITIONS
(SYNCHRO)**

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	44	190	130	157	201	32	94	17	127	23	10	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	200	137	165	212	34	99	18	134	24	11	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	245			337			926	937	268	1046	972	212
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			337			926	937	268	1046	972	212
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			86			52	92	83	83	95	98
cM capacity (veh/h)	1321			1222			205	221	770	140	211	829
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	383	165	212	34	251	53						
Volume Left	46	165	0	0	99	24						
Volume Right	137	0	0	34	134	18						
cSH	1321	1222	1700	1700	340	215						
Volume to Capacity	0.04	0.14	0.12	0.02	0.74	0.24						
Queue Length 95th (ft)	3	12	0	0	140	23						
Control Delay (s)	1.2	8.4	0.0	0.0	40.3	27.0						
Lane LOS	A	A			E	D						
Approach Delay (s)	1.2	3.4			40.3	27.0						
Approach LOS					E	D						
Intersection Summary												
Average Delay			12.2									
Intersection Capacity Utilization			57.7%		ICU Level of Service		B					
Analysis Period (min)			15									

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	20	257	63	543	335	75	51	26	604	65	11	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	271	66	572	353	79	54	27	636	68	12	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	432			337			1675	1921	168	2362	1914	216
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	432			337			1675	1921	168	2362	1914	216
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			53			0	21	25	0	67	99
cM capacity (veh/h)	1124			1219			30	35	846	1	35	789
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	21	180	156	572	235	196	717	84				
Volume Left	21	0	0	572	0	0	54	68				
Volume Right	0	0	66	0	0	79	636	4				
cSH	1124	1700	1700	1219	1700	1700	213	1				
Volume to Capacity	0.02	0.11	0.09	0.47	0.14	0.12	3.36	63.46				
Queue Length 95th (ft)	1	0	0	64	0	0	Err	Err				
Control Delay (s)	8.3	0.0	0.0	10.5	0.0	0.0	Err	Err				
Lane LOS	A			B			F	F				
Approach Delay (s)	0.5			6.0			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay			3707.5									
Intersection Capacity Utilization			89.6%		ICU Level of Service		E					
Analysis Period (min)			15									

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	23	722	182	327	808	98	98	67	352	76	15	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	760	192	344	851	103	103	71	371	80	16	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked												
vC, conflicting volume	954			952			2074	2546	476	2425	2591	477
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	954			952			2074	2546	476	2425	2591	477
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			52			0	0	31	0	0	91
cM capacity (veh/h)	716			718			0	13	535	0	12	534
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	24	507	445	344	567	387	544	144				
Volume Left	24	0	0	344	0	0	103	80				
Volume Right	0	0	192	0	0	103	371	48				
cSH	716	1700	1700	718	1700	1700	0	0				
Volume to Capacity	0.03	0.30	0.26	0.48	0.33	0.23	Err	Err				
Queue Length 95th (ft)	3	0	0	65	0	0	Err	Err				
Control Delay (s)	10.2	0.0	0.0	14.6	0.0	0.0	Err	Err				
Lane LOS	B			B			F	F				
Approach Delay (s)	0.3			3.9			Err	Err				
Approach LOS							F	F				
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization			84.9%		ICU Level of Service			E				
Analysis Period (min)			15									

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	0.95	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.91
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1703	1703
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3390	1441	1681	1770	1583	1770	3539	1583	3433	1703	1703
Volume (vph)	77	918	156	235	981	529	184	40	350	553	52	69
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	966	164	247	1033	557	194	42	368	582	55	73
RTOR Reduction (vph)	0	0	49	0	0	133	0	0	345	0	30	0
Lane Group Flow (vph)	81	966	115	247	1033	424	194	42	23	582	98	0
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	47.0	47.0	47.0	54.0	54.0	54.0	19.0	9.5	9.5	31.5	22.0	
Effective Green, g (s)	47.5	47.5	47.5	54.5	54.5	54.5	19.5	10.0	10.0	32.0	22.5	
Actuated g/C Ratio	0.30	0.30	0.30	0.34	0.34	0.34	0.12	0.06	0.06	0.20	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	525	1006	428	573	603	539	216	221	99	687	239	
v/s Ratio Prot	0.05	c0.28		0.15	c0.58		c0.11	0.01		c0.17	0.06	
v/s Ratio Perm			0.08			0.27			0.01			
v/c Ratio	0.15	0.96	0.27	0.43	1.71	0.79	0.90	0.19	0.23	0.85	0.41	
Uniform Delay, d1	41.4	55.3	43.0	40.8	52.8	47.5	69.3	71.2	71.3	61.6	62.7	
Progression Factor	1.00	1.00	1.00	0.83	0.86	0.88	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	19.4	0.3	1.5	325.4	7.3	34.5	0.4	1.2	9.5	1.1	
Delay (s)	41.6	74.7	43.3	35.5	370.9	49.1	103.8	71.6	72.6	71.1	63.8	
Level of Service	D	E	D	D	F	D	F	E	E	E	E	
Approach Delay (s)		68.3			228.2			82.5			69.8	
Approach LOS		E			F			F			E	
Intersection Summary												
HCM Average Control Delay			137.9		HCM Level of Service			F				
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			160.0		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			111.1%		ICU Level of Service			H				
Analysis Period (min)			15									
c Critical Lane Group												

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.95	0.95	0.95	0.95	0.88	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.85	1.00	0.99	1.00	0.95	0.95	1.00	0.95	1.00	0.93	1.00
Satd. Flow (prot)	5085	1583	3433	3518	1681	1689	2787	1770	1723	1770	1723	1723
Flt Permitted	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	5085	1583	3433	3518	1681	1689	2787	1770	1723	1770	1723	1723
Volume (vph)	0	817	842	178	409	17	689	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	860	886	187	431	18	725	19	601	9	9	9
RTOR Reduction (vph)	0	0	645	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	860	241	187	446	0	363	381	124	9	11	0
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	17.5	17.5	12.5	34.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Effective Green, g (s)	18.0	18.0	13.0	35.0	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Actuated g/C Ratio	0.22	0.22	0.16	0.44	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1144	356	558	1539	347	348	575	365	355	355	355	355
v/s Ratio Prot	c0.17	0.05	c0.13	0.22	c0.23	0.01	c0.01	0.01	c0.01	0.01	c0.01	0.01
v/s Ratio Perm	0.75	0.68	0.34	0.29	1.05	1.09	0.22	0.02	0.03	0.03	0.03	0.03
Uniform Delay, d1	28.9	28.3	29.7	14.5	31.8	31.8	26.4	25.3	25.4	25.4	25.4	25.4
Progression Factor	1.40	6.89	1.21	1.23	1.00	0.99	2.18	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	6.0	0.3	0.4	53.7	69.3	0.6	0.1	0.2	0.2	0.2	0.2
Delay (s)	43.1	201.3	36.2	18.2	85.3	100.8	58.1	25.5	25.5	25.5	25.5	25.5
Level of Service	D	F	D	B	F	F	E	C	C	C	C	C
Approach Delay (s)	123.3			23.5	77.5			25.5				
Approach LOS	F			C	E			C				
Intersection Summary												
HCM Average Control Delay	89.3			HCM Level of Service	F							
HCM Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)	12.0							
Intersection Capacity Utilization	70.5%			ICU Level of Service	C							
Analysis Period (min)	15											
c Critical Lane Group												

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00
Flt Protected	1.00	1.00	0.85	0.96	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1681	1686	1583	1745	1770	3527	1770	3527	1770	3527	1770	3527
Flt Permitted	0.95	0.95	1.00	0.97	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1681	1686	1583	1745	1770	3527	1770	3527	1770	3527	1770	3527
Volume (vph)	785	5	108	15	6	9	557	483	11	9	394	627
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	826	5	114	16	6	9	586	508	12	9	415	660
RTOR Reduction (vph)	0	0	84	0	9	0	0	2	0	0	0	562
Lane Group Flow (vph)	413	418	30	0	22	0	586	518	0	9	415	98
Turn Type	Split	Perm	Split	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split
Protected Phases	4	4	8	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	20.5	20.5	20.5	3.0	27.1	37.0	1.5	11.4	11.4	11.4	11.4	11.4
Effective Green, g (s)	21.0	21.0	21.0	3.5	27.6	37.5	2.0	11.9	11.9	11.9	11.9	11.9
Actuated g/C Ratio	0.26	0.26	0.26	0.04	0.35	0.47	0.02	0.15	0.15	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	441	443	416	76	611	1653	44	526	235	235	235	235
v/s Ratio Prot	0.25	c0.25	0.02	c0.01	c0.33	0.15	0.01	c0.12	0.06	0.06	0.06	0.06
v/s Ratio Perm	0.94	0.94	0.07	0.29	0.96	0.31	0.20	0.79	0.42	0.42	0.42	0.42
Uniform Delay, d1	28.8	28.9	22.2	37.1	25.6	13.2	38.2	32.8	30.9	30.9	30.9	30.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.08	1.14	3.86	3.86	3.86	3.86
Incremental Delay, d2	27.3	28.8	0.1	2.2	26.2	0.5	1.4	7.1	3.2	3.2	3.2	3.2
Delay (s)	56.2	57.7	22.2	39.2	51.9	13.7	42.5	44.6	122.5	122.5	122.5	122.5
Level of Service	E	E	C	D	D	B	D	D	F	F	F	F
Approach Delay (s)	52.8			39.2	33.9		92.0					
Approach LOS	D			D	C		F					
Intersection Summary												
HCM Average Control Delay	59.5			HCM Level of Service	E							
HCM Volume to Capacity ratio	0.89											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)	16.0							
Intersection Capacity Utilization	83.0%			ICU Level of Service	E							
Analysis Period (min)	15											
c Critical Lane Group												

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	1672
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	1672
Volume (vph)	58	539	45	122	584	347	69	17	123	504	48	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	567	47	128	615	365	73	18	129	531	51	109
RTOR Reduction (vph)	0	0	37	0	0	289	0	47	54	0	58	0
Lane Group Flow (vph)	61	567	10	128	615	76	73	31	15	531	102	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	16.1	16.1	4.4	16.1	16.1	4.4	17.1	17.1	24.4	37.1	
Effective Green, g (s)	4.9	16.6	16.6	4.9	16.6	16.6	4.9	17.6	17.6	24.9	37.6	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.22	0.22	0.31	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	734	328	210	734	328	210	344	331	551	786	
v/s Ratio Prot	0.03	c0.16		0.04	c0.17		c0.02	0.02		c0.30	c0.06	
v/s Ratio Perm			0.01			0.05			0.01			
v/c Ratio	0.56	0.77	0.03	0.61	0.84	0.23	0.35	0.09	0.05	0.96	0.13	
Uniform Delay, d1	36.5	29.9	25.3	36.6	30.4	26.4	36.0	24.8	24.6	27.1	12.0	
Progression Factor	1.00	1.00	1.00	0.87	0.51	0.56	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	5.1	0.0	4.0	6.7	0.3	1.0	0.5	0.3	29.2	0.3	
Delay (s)	43.1	35.0	25.3	35.8	22.1	15.0	37.0	25.4	24.8	56.3	12.3	
Level of Service	D	C	C	D	C	B	D	C	C	E	B	
Approach Delay (s)		35.0			21.4			29.1			46.1	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM Average Control Delay		31.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		64.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	1.00	0.95	0.95		1.00	1.00
Flt Protected	0.95	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	0.98
Satd. Flow (prot)	1770	6408	1583		5085	1583	1770	1504	1504		1748	1748
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.83	0.83
Satd. Flow (perm)	1770	6408	1583		5085	1583	1389	1504	1504		1503	1503
Volume (vph)	19	1354	504	0	986	343	554	0	376	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1425	531	0	1038	361	583	0	396	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	3	0	2	0
Lane Group Flow (vph)	20	1425	531	0	1038	361	583	195	195	0	16	0
Turn Type	Prot	Free	Free		Free	Perm	Perm	Perm	Perm		Perm	Perm
Protected Phases	7	4			8		2				6	
Permitted Phases			Free			Free	2					
Actuated Green, G (s)	2.2	34.8	80.0		28.1	80.0	36.2	36.2	36.2		36.2	
Effective Green, g (s)	2.7	35.3	80.0		28.6	80.0	36.7	36.7	36.7		36.7	
Actuated g/C Ratio	0.03	0.44	1.00		0.36	1.00	0.46	0.46	0.46		0.46	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	2828	1583		1818	1583	637	690	690		690	
v/s Ratio Prot	0.01	c0.22			c0.20		0.13					
v/s Ratio Perm			0.34			0.23	c0.42		0.13		0.01	
v/c Ratio	0.33	0.50	0.34		0.57	0.23	0.92	0.28	0.28		0.02	
Uniform Delay, d1	37.8	16.1	0.0		20.7	0.0	20.2	13.5	13.5		11.8	
Progression Factor	1.02	1.02	1.00		0.70	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.9	0.4	0.3		0.8	0.2	17.8	0.2	0.2		0.0	
Delay (s)	40.5	16.8	0.3		15.4	0.2	38.0	13.7	13.7		11.9	
Level of Service	D	B	A		B	A	D	B	B		B	
Approach Delay (s)		12.6			11.4			28.2			11.9	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay		15.7			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		60.8%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Volume (vph)	269	929	547	195	766	268	390	348	317	180	313	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	978	576	205	806	282	411	366	334	189	329	182
RTOR Reduction (vph)	0	0	373	0	75	0	0	0	251	0	0	150
Lane Group Flow (vph)	283	978	203	205	1013	0	250	527	83	167	351	32
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	22.5	22.5	9.8	19.8		16.0	16.0	16.0	13.7	13.7	13.7
Effective Green, g (s)	13.0	23.0	23.0	10.3	20.3		16.5	16.5	16.5	14.2	14.2	14.2
Actuated g/C Ratio	0.16	0.29	0.29	0.13	0.25		0.21	0.21	0.21	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1017	455	228	1240		332	689	326	286	600	281
v/s Ratio Prot	0.08	c0.28		0.12	c0.21		0.16	c0.16		0.10	c0.10	
v/s Ratio Perm			0.13						0.05			0.02
v/c Ratio	0.51	0.96	0.45	0.90	0.82		0.75	0.76	0.26	0.58	0.58	0.11
Uniform Delay, d1	30.6	28.1	23.3	34.3	28.1		29.8	29.9	26.6	30.2	30.2	27.6
Progression Factor	0.56	0.55	1.21	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	19.1	2.9	33.4	6.0		9.3	5.1	0.4	3.0	1.5	0.2
Delay (s)	17.9	34.7	31.0	67.7	34.1		39.1	35.0	27.0	33.2	31.7	27.8
Level of Service	B	C	C	E	C		D	C	C	C	C	C
Approach Delay (s)		30.9			39.5			33.5			31.0	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay			33.8		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			73.0%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

SIGNAL WARRANT ANALYSIS
No BUILD

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM	806	42	Y			Y				
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,186	122	Y			Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM	70	30								
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	108	30								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	140		525	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM	70	30								
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	108	30								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			178	60	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langer Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langer Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					350	105		525	53				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM	70	30									
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	108	30									
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			178	60	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM	41	3								
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	83	7								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM	45	10								
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	91	19								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			136	29	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM	469	50								
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,003	160	Y		Y	Y	Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			1			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Existing](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,407	187	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
					1,407	187	1			1			1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,424	216	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: **Wilfred Ave and Primrose Ave**

COUNT DATE: **Near-Term No Build**

MAJOR STREET: **Wilfred Ave**

OF APPROACH LANES: **1**

MINOR STREET: **Primrose Ave**

OF APPROACH LANES: **1**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	372	30								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: **Based on 2000 MUTCD**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	140		525	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	381	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: **Wilfred Ave and Langer Ave**

COUNT DATE: **Near-Term No Build**

MAJOR STREET: **Wilfred Ave**

OF APPROACH LANES: **1**

MINOR STREET: **Langer Ave**

OF APPROACH LANES: **1**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **Y**

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	105		525	53			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	370	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: **Based on 2000 MUTCD**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	524	307	Y	Y	Y		Y		Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			0			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	833	347	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: **Redwood Drive and Business Park Drive**

COUNT DATE: **Near-Term No Build**

MAJOR STREET: **Redwood Drive**

OF APPROACH LANES: **2**

MINOR STREET: **Business Park Drive**

OF APPROACH LANES: **2**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,027	261	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,027	261	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: **Based on 2000 MUTCD**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,420	203	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	348	1								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			348	1	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	346	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	432	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	425	33								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	392	37								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,378	299	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,378	299	1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: **Wilfred Ave and Primrose Ave**

COUNT DATE: **Cumulative No Build**

MAJOR STREET: **Wilfred Ave**

OF APPROACH LANES: **1**

MINOR STREET: **Primrose Ave**

OF APPROACH LANES: **1**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	488	30								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: **Based on 2000 MUTCD**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	200		750	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	488	30								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	488	30								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	812	622	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,827	807	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	759	175	Y				Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					759	175	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED		

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Story Point Rd and Milbrae Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Story Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,485	291	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,485	291	1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	441	3								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	440	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	519	140	Y			Y						
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					519	140	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	444	140					Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					444	140	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative No Build](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	417	55								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

**SIGNAL WARRANT ANALYSIS
ALTERNATIVE A**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,586	305	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	609	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	200		750	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	610	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langer Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langer Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	694	299	Y	Y	Y		Y		Y		
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			694	299	1			0			1	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,284	582	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,833	110	Y		Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					600	150		900	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,534	0	Y		Y						
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			1,534	0	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Business Park Dr](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Business Park Dr](#)

OF APPROACH LANES: [1](#)

Project Driveay

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	423	322		Y		Y		Y		
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	847	229	Y	Y	Y		Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			847	229	1			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,614	228	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	32	0								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			32	0	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	32	0								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			32	0	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	22	11								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			22	11	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	22	0								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	398	32								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,699	321	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	749	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	200		750	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	741	30	Y									
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					741	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	832	293	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,478	781	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,429	517	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			2,429	517	1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,534	0	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,534	0	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Business Park Dr](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Business Park Dr](#)

OF APPROACH LANES: [1](#)

Project Driveay

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	423	322		Y			Y		Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			423	322	0			0			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	847	229	Y	Y	Y		Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					847	229	1			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED		

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,675	274	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	427	4								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			427	4	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	430	11								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	510	26	Y									
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					510	26	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED		

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	427	136					Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			427	136	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All A](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	404	32								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

**SIGNAL WARRANT ANALYSIS
ALTERNATIVE B**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,631	390	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,103	1020	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	140		525	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,785	30	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	105		525	53			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,774	30	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,928	307	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,318	347	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,120	108	Y		Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,027	261	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,027	261	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Stony Point Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,627	225	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			1,627	225	1			1			1	1	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	348	23								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			348	23	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	346	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	432	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			432	16	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	425	33								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	392	37								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,585	473	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,219	1020	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	200		750	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,892	30	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,892	30	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,892	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,216	454	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	3,231	807	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Cum Alt B](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,083	108	Y		Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	759	175	Y				Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					759	175	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,692	289	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	441	25								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	440	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	519	52	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	444	140					Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt B](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	417	55								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

**SIGNAL WARRANT ANALYSIS
ALTERNATIVE C**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,800	517	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,049	41	Y		Y						
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			1,049	41	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	140		525	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,593	1095	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langer Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langer Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	105		525	53			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,948	30	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,102	307	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,492	347	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,947	0	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,947	0	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,027	261	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,027	261	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,616	235	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	370	12								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	346	32									
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			346	32	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	432	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	425	33								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	392	37								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative Alt C](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,754	600	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,165	41	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,165	41	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	200		750	100				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,700	1095	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			1,700	1,095	1			1			1	1	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langer Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langer Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,066	30	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,390	454	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	3,405	807	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Cum Alt C](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,910	0	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,910	0	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	759	175	Y				Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					759	175	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,681	299	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	463	14								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	440	32								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	519	52								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	444	140					Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					444	140	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All C](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	417	55								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

SIGNAL WARRANT ANALYSIS
ALTERNATIVE D

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,567	336	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	878	713	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					350	140		525	70					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	1,351	30	Y			Y						
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					1,351	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					350	105		525	53				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,340	30	Y		Y						
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			1,340	30	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,494	307	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
					1,494	307	1			1			1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,884	347	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,918	74	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,027	261	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,027	261	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,563	218	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
					1,563	218	1			1			1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	348	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	432	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	346	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	425	33								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	392	37								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					420	140		630	70					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	1,521	419	Y	Y	Y	Y	Y	Y	Y	Y		
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					1,521	419	1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	994	713	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	200		750	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,458	30	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,458	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,458	30	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,458	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,782	454	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
					1,782	454	1			1			1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,797	807	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Cum Alt D](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,881	74	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,881	74	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	759	175	Y				Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					759	175	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,628	282	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	441	18								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			441	18	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	440	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	519	52	Y									
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					519	52	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Lebath Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Lebath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	444	140					Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt D](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	417	55								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			417	55	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

**SIGNAL WARRANT ANALYSIS
ALTERNATIVE E**

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,477	332	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	466	457		Y		Y		Y		Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					350	140		525	70				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	761	30	Y		Y						
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			761	30	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langer Ave](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langer Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					350	105		525	53					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	750	30	Y			Y						
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					750	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	904	307	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,294	347	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,645	37	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,645	37	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,027	261	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,027	261	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Road and Millbrae Avenue](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Stony Point Road](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,473	212	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Avenue and Millbrae Avenue](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	348	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Avenue and Millbrae Avenue](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	346	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Avenue and Millbrae Avenue](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	432	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Avenue and Millbrae Avenue](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	425	33								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			425	33	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Avenue and Millbrae Avenue](#)

COUNT DATE: [Near-Term Alt E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	392	37								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative Alt E](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,431	415	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Cumulative Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	582	457	Y	Y	Y		Y		Y	Y		
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					582	457	1			0			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	200		750	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	868	30	Y		Y							
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					868	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langer Ave](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langer Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	868	30	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			868	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative Alt E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,192	454	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
					1,192	454	1			1			1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,207	807	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Cum Alt E](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,608	37	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,608	37	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					600	200		900	100					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	759	175	Y				Y					
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					759	175	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Road and Millbrae Avenue](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Stony Point Road](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					420	140		630	70				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	1,538	276	Y	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			1,538	276	1			1			1	1	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Avenue and Millbrae Avenue](#)

COUNT DATE: [Cumulative Alt E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	441	12								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			441	12	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Avenue and Millbrae Avenue](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	440	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Avenue and Millbrae Avenue](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	519	32	Y									
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					519	32	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED		1 HR NEEDED NOT SATISFIED	

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Avenue and Millbrae Avenue](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	444	140					Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Avenue and Millbrae Avenue](#)

COUNT DATE: [Cumulative All E](#)

MAJOR STREET: [Millbrae Avenue](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Avenue](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	417	55								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

SIGNAL WARRANT ANALYSIS
ALTERNATIVE H

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	288	862		Y		Y		Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	514	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					350	140		525	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	515	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	576	216	Y	Y	Y		Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,005	432	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,426	110	Y		Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,542	0	Y			Y				
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,542	0	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

Near-Term Alt H
COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,027	261	Y	Y	Y	Y	Y	Y	Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			1,027	261	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,554	218	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	359	2									
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			359	2	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	437	16								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			437	16	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	359	10								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Labath Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	421	42								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			421	42	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Near-Term Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	398	32									
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			398	32	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Wilfred Ave](#)

COUNT DATE: [Cumulative Alt H](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [Y](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					420	140		630	70			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,643	938	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-2

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-4

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Primrose Ave](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	654	30	Y								
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			654	30	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Whistler Ave](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	200		750	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	646	30	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			646	30	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	714	210	Y	Y	Y		Y		Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			714	210	1			0			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Labath Ave](#)

COUNT DATE: [Cumulative Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Labath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,199	631	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Dowdell Ave](#)

COUNT DATE: [Cumulative Alt H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	2,022	517	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Project Driveway](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Project Driveway](#)

OF APPROACH LANES: [1](#)

Project Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	150		900	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,610	0	Y		Y					
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Redwood Drive and Business Park Drive](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Redwood Drive](#)

OF APPROACH LANES: [2](#)

MINOR STREET: [Business Park Drive](#)

OF APPROACH LANES: [2](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					600	200		900	100			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	847	229	Y	Y	Y		Y			
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			847	229	1			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Stony Point Rd and Milbrae Ave](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Stony Point Rd](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	1,615	264	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					1			1			1	1
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Primrose Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Primrose Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	417	4								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Whistler Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Whistler Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	420	11								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Langner Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	503	22	Y							
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			503	22	0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Lebath Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative All H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Lebath Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET			
THRESHOLD VALUES					500	150		750	75				
06:00 AM	TO	07:00 AM											
07:00 AM	TO	08:00 AM											
08:00 AM	TO	09:00 AM											
09:00 AM	TO	10:00 AM											
10:00 AM	TO	11:00 AM											
11:00 AM	TO	12:00 PM											
12:00 PM	TO	01:00 PM											
01:00 PM	TO	02:00 PM											
02:00 PM	TO	03:00 PM											
03:00 PM	TO	04:00 PM											
04:00 PM	TO	05:00 PM											
05:00 PM	TO	06:00 PM	427	129					Y				
06:00 PM	TO	07:00 PM											
07:00 PM	TO	08:00 PM											
08:00 PM	TO	09:00 PM											
09:00 PM	TO	10:00 PM											
			427	129	0			0			0	0	
						8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Dowdell Ave and Milbrae Ave](#)

COUNT DATE: [Cumulative Alt H](#)

MAJOR STREET: [Milbrae Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Dowdell Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	404	32								
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
					0			0			0	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

SIGNAL WARRANT ANALYSIS
VARIANT H-SUB1

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Near-Term Var H1](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES					500	150		750	75			
06:00 AM	TO	07:00 AM										
07:00 AM	TO	08:00 AM										
08:00 AM	TO	09:00 AM										
09:00 AM	TO	10:00 AM										
10:00 AM	TO	11:00 AM										
11:00 AM	TO	12:00 PM										
12:00 PM	TO	01:00 PM										
01:00 PM	TO	02:00 PM										
02:00 PM	TO	03:00 PM										
03:00 PM	TO	04:00 PM										
04:00 PM	TO	05:00 PM										
05:00 PM	TO	06:00 PM	617	244	Y	Y	Y		Y		Y	
06:00 PM	TO	07:00 PM										
07:00 PM	TO	08:00 PM										
08:00 PM	TO	09:00 PM										
09:00 PM	TO	10:00 PM										
			617	244	1			0			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1

WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: [Wilfred Ave and Langner Ave](#)

COUNT DATE: [Cumulative Var H](#)

MAJOR STREET: [Wilfred Ave](#)

OF APPROACH LANES: [1](#)

MINOR STREET: [Langner Ave](#)

OF APPROACH LANES: [1](#)

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): [N](#)

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): [N](#)

			MAJOR ST BOTH APPROACHES	MINOR ST HIGHEST APPROACH	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3		
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET				
THRESHOLD VALUES					500	150		750	75					
06:00 AM	TO	07:00 AM												
07:00 AM	TO	08:00 AM												
08:00 AM	TO	09:00 AM												
09:00 AM	TO	10:00 AM												
10:00 AM	TO	11:00 AM												
11:00 AM	TO	12:00 PM												
12:00 PM	TO	01:00 PM												
01:00 PM	TO	02:00 PM												
02:00 PM	TO	03:00 PM												
03:00 PM	TO	04:00 PM												
04:00 PM	TO	05:00 PM												
05:00 PM	TO	06:00 PM	754	238	Y	Y	Y	Y	Y	Y	Y			
06:00 PM	TO	07:00 PM												
07:00 PM	TO	08:00 PM												
08:00 PM	TO	09:00 PM												
09:00 PM	TO	10:00 PM												
					754	238	1			1			1	0
					8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED		

WARRANT 1 - Condition A -- Minimum Vehicular Volume Warrant (8 hours)

WARRANT 1 - Condition B -- Interruption of Continuous Traffic Warrant (8 hours)

WARRANT 2 -- Four Hour Volume Warrant - Figure 4C-1




















WARRANT 3 -- Peak Hour Volume Warrant - Figure 4C-3

Conditions: [Based on 2000 MUTCD](#)

**NEAR-TERM 2008 + ALTERNATIVE A
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**













1: Wilfred Avenue & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.91			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1780	1583	1770	1826		1770	1860	
Flt Permitted		1.00			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1699			1351	1583	1770	1826		1770	1860	
Volume (vph)	0	8	14	139	11	155	11	754	116	185	514	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	15	146	12	163	12	794	122	195	541	6
RTOR Reduction (vph)	0	13	0	0	0	102	0	6	0	0	0	0
Lane Group Flow (vph)	0	10	0	0	158	61	12	910	0	195	547	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		13.2			13.2	13.2	1.0	47.3		11.0	57.3	
Effective Green, g (s)		13.7			13.7	13.7	1.5	47.8		11.5	57.8	
Actuated g/C Ratio		0.16			0.16	0.16	0.02	0.56		0.14	0.68	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		274			218	255	31	1027		239	1265	
v/s Ratio Prot		0.01					0.01	c0.50		c0.11	0.29	
v/s Ratio Perm					c0.12	0.04						
v/c Ratio		0.04			0.72	0.24	0.39	0.89		0.82	0.43	
Uniform Delay, d1		30.1			33.9	31.1	41.3	16.2		35.7	6.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			11.3	0.5	7.8	9.3		18.9	0.2	
Delay (s)		30.1			45.2	31.6	49.1	25.6		54.6	6.4	
Level of Service		C			D	C	D	C		D	A	
Approach Delay (s)		30.1			38.3			25.9			19.1	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM Average Control Delay		25.4			HCM Level of Service				C			
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		85.0			Sum of lost time (s)				12.0			
Intersection Capacity Utilization		81.9%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

2: Wilfred Avenue & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<div>↔</div>											
Sign Control	<div>Free</div>											
Grade	<div>0%</div>											
Volume (veh/h)	10	289	10	8	284	8	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	304	11	8	299	8	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	<div>None</div>											
Median storage (veh)	<div>None</div>											
Upstream signal (ft)	<div>1210</div>											
pX, platoon unblocked												
vC, conflicting volume	307			315			666	655	309	666	656	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	307			315			666	655	309	666	656	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	99	97	97	99
cM capacity (veh/h)	1253			1245			356	380	731	355	379	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	325	316	32	32								
Volume Left	11	8	11	11								
Volume Right	11	8	11	11								
cSH	1253	1245	440	441								
Volume to Capacity	0.01	0.01	0.07	0.07								
Queue Length 95th (ft)	1	1	6	6								
Control Delay (s)	0.3	0.3	13.8	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	13.8	13.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			30.4%	ICU Level of Service		A						
Analysis Period (min)			15									

3: Wilfred Avenue & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	288	10	7	280	15	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	303	11	7	295	16	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	311			314			663	655	308	663	652	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311			314			663	655	308	663	652	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	99	97	97	99
cM capacity (veh/h)	1250			1247			358	380	732	358	382	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	324	318	32	32								
Volume Left	11	7	11	11								
Volume Right	11	16	11	11								
cSH	1250	1247	442	443								
Volume to Capacity	0.01	0.01	0.07	0.07								
Queue Length 95th (ft)	1	0	6	6								
Control Delay (s)	0.3	0.2	13.8	13.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	13.8	13.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			30.6%		ICU Level of Service			A				
Analysis Period (min)			15									









4: Wilfred Avenue & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕		↕	↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	138	159	110	185	8	118	21	160	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	145	167	116	195	8	124	22	168	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)					1160							
pX, platoon unblocked												
vC, conflicting volume	203			313			692	685	229	860	764	199
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	203			313			692	685	229	860	764	199
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			91			61	93	79	95	96	99
cM capacity (veh/h)	1369			1248			318	334	810	192	300	842
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1						
Volume Total	323	116	203	124	191	32						
Volume Left	11	116	0	124	0	11						
Volume Right	167	0	8	0	168	11						
cSH	1369	1248	1700	318	695	308						
Volume to Capacity	0.01	0.09	0.12	0.39	0.27	0.10						
Queue Length 95th (ft)	1	8	0	45	28	8						
Control Delay (s)	0.3	8.2	0.0	23.4	12.1	18.0						
Lane LOS	A	A		C	B	C						
Approach Delay (s)	0.3	3.0		16.6		18.0						
Approach LOS				C		C						
Intersection Summary												
Average Delay				6.9								
Intersection Capacity Utilization				51.0%		ICU Level of Service		A				
Analysis Period (min)				15								









5: Wilfred Avenue & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.96	
Satd. Flow (prot)	1770	1803		1770	1840			1816	1583		1779	
Flt Permitted	0.95	1.00		0.95	1.00			0.85	1.00		0.78	
Satd. Flow (perm)	1770	1803		1770	1840			1577	1583		1452	
Volume (vph)	15	229	63	357	277	25	26	24	532	17	3	1
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	241	66	376	292	26	27	25	560	18	3	1
RTOR Reduction (vph)	0	7	0	0	2	0	0	0	495	0	1	0
Lane Group Flow (vph)	16	300	0	376	316	0	0	52	65	0	21	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2		2		6		
Actuated Green, G (s)	2.2	49.3		26.1	73.2			11.1	11.1		11.1	
Effective Green, g (s)	2.7	49.8		26.6	73.7			11.6	11.6		11.6	
Actuated g/C Ratio	0.03	0.50		0.27	0.74			0.12	0.12		0.12	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	48	898		471	1356			183	184		168	
v/s Ratio Prot	0.01	c0.17		c0.21	0.17							
v/s Ratio Perm								0.03	c0.04		0.01	
v/c Ratio	0.33	0.33		0.80	0.23			0.28	0.35		0.13	
Uniform Delay, d1	47.8	15.1		34.2	4.2			40.4	40.7		39.7	
Progression Factor	1.00	1.00		0.81	0.70			0.98	0.90		0.88	
Incremental Delay, d2	4.1	1.0		8.3	0.4			0.9	1.2		0.3	
Delay (s)	51.8	16.1		35.9	3.3			40.4	37.9		35.1	
Level of Service	D	B		D	A			D	D		D	
Approach Delay (s)		17.9			20.9			38.1			35.1	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		26.9			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		62.2%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												













6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.91		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.97	
Satd. Flow (prot)	1770	1841		1770	1853			1676	1740		1740	
Flt Permitted	0.95	1.00		0.95	1.00			0.93	0.62		0.62	
Satd. Flow (perm)	1770	1841		1770	1853			1575	1116		1116	
Volume (vph)	11	708	59	82	633	23	21	14	75	14	2	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	745	62	86	666	24	22	15	79	15	2	6
RTOR Reduction (vph)	0	3	0	0	1	0	0	72	0	0	5	0
Lane Group Flow (vph)	12	804	0	86	689	0	0	44	0	0	18	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2		2		6		
Actuated Green, G (s)	1.5	67.9		10.3	76.7			8.3			8.3	
Effective Green, g (s)	2.0	68.4		10.8	77.2			8.8			8.8	
Actuated g/C Ratio	0.02	0.68		0.11	0.77			0.09			0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	35	1259		191	1431			139			98	
v/s Ratio Prot	0.01	c0.44		0.05	c0.37							
v/s Ratio Perm								c0.03			0.02	
v/c Ratio	0.34	0.64		0.45	0.48			0.32			0.18	
Uniform Delay, d1	48.4	8.9		41.8	4.1			42.8			42.3	
Progression Factor	1.12	0.72		0.90	0.49			1.00			1.00	
Incremental Delay, d2	4.3	1.8		1.3	0.9			1.3			0.9	
Delay (s)	58.3	8.2		39.0	2.9			44.1			43.1	
Level of Service	E	A		D	A			D			D	
Approach Delay (s)		9.0			6.9			44.1			43.1	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM Average Control Delay		10.8			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		61.8%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												













7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	1738	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	1738	
Volume (vph)	50	681	67	180	461	541	172	154	267	425	128	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	717	71	189	485	569	181	162	281	447	135	109
RTOR Reduction (vph)	0	0	38	0	0	297	0	0	237	0	29	0
Lane Group Flow (vph)	53	717	33	189	485	272	181	162	44	447	215	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	7.3	42.5	42.5	12.1	47.3	47.3	12.1	13.9	13.9	13.5	15.3	
Effective Green, g (s)	7.8	43.0	43.0	12.6	47.8	47.8	12.6	14.4	14.4	14.0	15.8	
Actuated g/C Ratio	0.08	0.43	0.43	0.13	0.48	0.48	0.13	0.14	0.14	0.14	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	138	801	681	223	891	757	223	510	228	481	275	
v/s Ratio Prot	0.03	c0.38		c0.11	0.26		0.10	0.05		c0.13	c0.12	
v/s Ratio Perm			0.02			0.17			0.03			
v/c Ratio	0.38	0.90	0.05	0.85	0.54	0.36	0.81	0.32	0.19	0.93	0.78	
Uniform Delay, d1	43.8	26.4	16.6	42.8	18.4	16.4	42.5	38.4	37.7	42.5	40.4	
Progression Factor	1.15	0.76	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.87	
Incremental Delay, d2	1.4	12.3	0.1	24.6	2.4	1.3	19.7	0.4	0.4	24.2	13.3	
Delay (s)	51.6	32.4	16.2	67.3	20.8	17.8	62.2	38.8	38.1	61.6	48.3	
Level of Service	D	C	B	E	C	B	E	D	D	E	D	
Approach Delay (s)		32.2			26.5			45.3			56.9	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		37.5			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		81.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Volume (vph)	5	30	138	5	95	95	164	151	5	30	237	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	145	5	100	100	173	159	5	32	249	5
RTOR Reduction (vph)	0	0	132	0	91	0	0	0	2	0	1	0
Lane Group Flow (vph)	5	32	13	5	109	0	173	159	3	32	253	0
Turn Type	Prot	Perm	Perm	Prot			Prot	Perm	Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.3	8.4	8.4	1.3	8.4		25.3	67.3	67.3	5.0	47.0	
Effective Green, g (s)	1.8	8.9	8.9	1.8	8.9		25.8	67.8	67.8	5.5	47.5	
Actuated g/C Ratio	0.02	0.09	0.09	0.02	0.09		0.26	0.68	0.68	0.06	0.48	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	32	166	141	32	291		457	2399	1073	97	1676	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.04		c0.02	c0.07	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.16	0.19	0.09	0.16	0.37		0.38	0.07	0.00	0.33	0.15	
Uniform Delay, d1	48.4	42.2	41.8	48.4	42.9		30.5	5.4	5.2	45.5	14.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.90	0.98	0.97	1.00	1.00	
Incremental Delay, d2	2.3	0.6	0.3	2.3	0.8		0.5	0.0	0.0	2.0	0.2	
Delay (s)	50.6	42.8	42.1	50.6	43.7		28.0	5.4	5.0	47.5	15.0	
Level of Service	D	D	D	D	D		C	A	A	D	B	
Approach Delay (s)		42.5			43.9			17.0			18.7	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay		27.5			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.25										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		31.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												





























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖↖	↗	↖↖	↖↖					↗	↖↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3057	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3057	
Volume (vph)	0	814	557	93	562	0	0	0	0	327	327	619
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	857	586	98	592	0	0	0	0	344	344	652
RTOR Reduction (vph)	0	0	140	0	0	0	0	0	0	0	193	0
Lane Group Flow (vph)	0	857	446	98	592	0	0	0	0	344	803	0
Turn Type			Perm	Prot						Perm		
Protected Phases		4		3	8						6	
Permitted Phases			4							6		
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	994	
v/s Ratio Prot		0.24		c0.03	0.17							
v/s Ratio Perm			c0.28							0.21	0.26	
v/c Ratio		0.52	0.61	0.47	0.29					0.66	0.96dr	
Uniform Delay, d1		15.2	16.0	36.3	8.7					23.2	24.7	
Progression Factor		1.00	1.00	1.01	1.18					1.00	1.00	
Incremental Delay, d2		1.2	3.7	1.5	0.3					6.4	7.0	
Delay (s)		16.4	19.7	38.3	10.5					29.5	31.8	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		17.7			14.5		0.0				31.2	
Approach LOS		B			B		A				C	
Intersection Summary												
HCM Average Control Delay		22.3		HCM Level of Service				C				
HCM Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		73.5%		ICU Level of Service				D				
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												












10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		 	 						 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88			
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583	3433	3539		1681	1681	2787			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583	3433	3539		1681	1681	2787			
Volume (vph)	0	538	675	409	405	0	325	0	581	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	566	711	431	426	0	342	0	612	0	0	0
RTOR Reduction (vph)	0	0	542	0	0	0	0	0	486	0	0	0
Lane Group Flow (vph)	0	566	169	431	426	0	171	171	126	0	0	0
Turn Type	Perm		Perm	Prot			Split		Perm	Split		
Protected Phases		4		3	8		2	2		6	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		18.5	18.5	11.5	34.5		16.0	16.0	16.0			
Effective Green, g (s)		19.0	19.0	12.0	35.0		16.5	16.5	16.5			
Actuated g/C Ratio		0.24	0.24	0.15	0.44		0.21	0.21	0.21			
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		1208	376	515	1548		347	347	575			
v/s Ratio Prot		c0.11		c0.13	0.12		c0.10	0.10				
v/s Ratio Perm			0.11						0.05			
v/c Ratio		0.47	0.45	0.84	0.28		0.49	0.49	0.22			
Uniform Delay, d1		26.2	26.0	33.0	14.4		28.1	28.1	26.4			
Progression Factor		0.62	1.21	1.00	1.00		1.11	1.11	4.46			
Incremental Delay, d2		1.1	3.3	11.3	0.4		4.6	4.6	0.8			
Delay (s)		17.4	34.8	44.4	14.8		35.8	35.8	118.5			
Level of Service		B	C	D	B		D	D	F			
Approach Delay (s)		27.1			29.7		88.9				0.0	
Approach LOS		C			C		F				A	
Intersection Summary												
HCM Average Control Delay		46.9			HCM Level of Service				D			
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)				32.5			
Intersection Capacity Utilization		60.1%			ICU Level of Service				B			
Analysis Period (min)		15										
c Critical Lane Group												
























11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Flt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3510		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3510		1770	1583
Volume (vph)	187	926	614	35	93	217
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	975	646	37	98	228
RTOR Reduction (vph)	0	0	4	0	0	166
Lane Group Flow (vph)	197	975	679	0	98	62
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	26.5	64.1	33.1		26.9	26.9
Effective Green, g (s)	27.0	64.6	33.6		27.4	27.4
Actuated g/C Ratio	0.27	0.65	0.34		0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	927	2286	1179		485	434
v/s Ratio Prot	0.06	c0.28	c0.19		c0.06	
v/s Ratio Perm						0.04
v/c Ratio	0.21	0.43	0.58		0.20	0.14
Uniform Delay, d1	28.3	8.6	27.3		27.9	27.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.6	2.1		0.9	0.7
Delay (s)	28.4	9.2	29.4		28.8	28.1
Level of Service	C	A	C		C	C
Approach Delay (s)		12.5	29.4		28.3	
Approach LOS		B	C		C	
Intersection Summary						
HCM Average Control Delay		20.1		HCM Level of Service	C	
HCM Volume to Capacity ratio		0.41				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		38.6%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Flt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	425	3	358	8	3	5	514	475	2	7	408	679
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	447	3	377	8	3	5	541	500	2	7	429	715
RTOR Reduction (vph)	0	0	299	0	5	0	0	0	0	0	0	531
Lane Group Flow (vph)	224	226	78	0	11	0	541	502	0	7	429	184
Turn Type	Split		Perm		Split		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	16.0	16.0	16.0		1.5		27.1	43.0		1.5	17.4	17.4
Effective Green, g (s)	16.5	16.5	16.5		2.0		27.6	43.5		2.0	17.9	17.9
Actuated g/C Ratio	0.21	0.21	0.21		0.02		0.35	0.54		0.02	0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	347	348	326		44		611	1923		44	792	354
v/s Ratio Prot	0.13	c0.13			c0.01		c0.31	0.14		0.00	c0.12	
v/s Ratio Perm			0.05									0.12
v/c Ratio	0.65	0.65	0.24		0.25		0.89	0.26		0.16	0.54	0.52
Uniform Delay, d1	29.1	29.1	26.5		38.3		24.7	9.7		38.2	27.4	27.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		0.70	1.28	3.96
Incremental Delay, d2	4.1	4.1	0.4		3.0		14.4	0.3		1.0	1.6	3.2
Delay (s)	33.2	33.2	26.9		41.3		39.1	10.0		27.6	36.6	111.3
Level of Service	C	C	C		D		D	B		C	D	F
Approach Delay (s)		30.3			41.3			25.1			82.9	
Approach LOS		C			D			C			F	
Intersection Summary												
HCM Average Control Delay			48.5				HCM Level of Service	D				
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)	16.0				
Intersection Capacity Utilization			83.9%				ICU Level of Service	E				
Analysis Period (min)			15									
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	891	0	0	686
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	938	0	0	722
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						1034
pX, platoon unblocked	0.86					
vC, conflicting volume	1660	938			938	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1765	938			938	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	80	321			731	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	938	722			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.55	0.42			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		50.2%		ICU Level of Service	A	
Analysis Period (min)		15				













14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Volume (veh/h)	305	105	74	318	0	322
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	321	111	78	335	0	339
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	413				998	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	413				998	245
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	72				100	57
cM capacity (veh/h)	1146				195	794
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	432	413	339			
Volume Left	321	0	0			
Volume Right	0	335	339			
cSH	1146	1700	794			
Volume to Capacity	0.28	0.24	0.43			
Queue Length 95th (ft)	29	0	54			
Control Delay (s)	7.7	0.0	12.9			
Lane LOS	A		B			
Approach Delay (s)	7.7	0.0	12.9			
Approach LOS			B			
Intersection Summary						
Average Delay			6.5			
Intersection Capacity Utilization		75.8%		ICU Level of Service	D	
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	172	89	33	464	489	41	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	181	94	35	488	515	43	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	850	279	558				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	850	279	558				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	37	87	97				
cM capacity (veh/h)	289	718	1009				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	181	94	35	244	244	343	215
Volume Left	181	0	35	0	0	0	0
Volume Right	0	94	0	0	0	0	43
cSH	289	718	1009	1700	1700	1700	1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20	0.13
Queue Length 95th (ft)	97	11	3	0	0	0	0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	B	A				
Approach Delay (s)	27.5		0.6			0.0	
Approach LOS	D						
Intersection Summary							
Average Delay	5.8						
Intersection Capacity Utilization	37.7%			ICU Level of Service		A	
Analysis Period (min)	15						

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	286	605	251	212	473
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	301	637	264	223	498
RTOR Reduction (vph)	0	235	0	150	0	0
Lane Group Flow (vph)	271	66	637	114	223	498
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.7	26.7	9.4	40.6
Effective Green, g (s)	13.8	13.8	27.2	27.2	9.9	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	806	685	279	1217
v/s Ratio Prot	c0.15		c0.34		c0.13	
v/s Ratio Perm	0.04		0.07			
v/c Ratio	0.70	0.19	0.79	0.17	0.80	0.41
Uniform Delay, d1	22.6	20.0	15.4	10.9	25.5	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.3	7.8	0.5	14.7	1.0
Delay (s)	28.0	20.3	23.2	11.4	40.3	6.2
Level of Service	C	C	C	B	D	A
Approach Delay (s)	24.0		19.7			16.7
Approach LOS	C		B			B
Intersection Summary						
HCM Average Control Delay		19.8		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		62.9		Sum of lost time (s)	12.0	
Intersection Capacity Utilization		67.8%		ICU Level of Service	C	
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	0.95	0.95	0.95
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1681	1647	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1681	1647	
Volume (vph)	50	600	36	202	575	459	64	19	154	592	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	483	67	20	162	623	45	104
RTOR Reduction (vph)	0	0	29	0	0	352	0	62	69	0	17	0
Lane Group Flow (vph)	53	632	9	213	605	131	67	35	16	390	365	0
Turn Type	Prot	Perm	Prot	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases			4		8			2				
Actuated Green, G (s)	3.3	18.0	18.0	6.5	21.2	21.2	15.0	15.0	15.0	22.5	22.5	
Effective Green, g (s)	3.8	18.5	18.5	7.0	21.7	21.7	15.5	15.5	15.5	23.0	23.0	
Actuated g/C Ratio	0.05	0.23	0.23	0.09	0.27	0.27	0.19	0.19	0.19	0.29	0.29	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	300	960	429	665	302	291	483	474	
v/s Ratio Prot	0.03	c0.18		0.06	c0.17		0.02	c0.02		c0.23	0.22	
v/s Ratio Perm			0.01		0.08			0.01				
v/c Ratio	0.63	0.77	0.02	0.71	0.63	0.31	0.10	0.12	0.06	0.81	0.77	
Uniform Delay, d1	37.4	28.8	23.8	35.5	25.6	23.2	26.5	26.6	26.3	26.4	26.1	
Progression Factor	1.00	1.00	1.00	0.99	0.50	0.81	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	4.5	0.8	0.2	0.3	0.8	0.4	13.5	11.4	
Delay (s)	51.8	33.3	23.8	39.5	13.7	18.9	26.8	27.4	26.7	40.0	37.5	
Level of Service	D	C	C	D	B	B	C	C	C	D	D	
Approach Delay (s)		34.2			19.9			27.0			38.8	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM Average Control Delay		28.6			HCM Level of Service		C					
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)		16.0					
Intersection Capacity Utilization		59.7%			ICU Level of Service		B					
Analysis Period (min)		15										
c Critical Lane Group												













18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	1023	146	371	961	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	1077	154	391	1012	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	226	0	117	227	0	0	206
Lane Group Flow (vph)	245	1077	51	391	1012	151	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4		8			2				6
Actuated Green, G (s)	12.2	26.0	26.0	11.5	25.3	25.3	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.7	26.5	26.5	12.0	25.8	25.8	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	1684	524	515	1141	511	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.21		0.11	c0.29		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03		0.10			0.03				0.03
v/c Ratio	0.87	0.64	0.10	0.76	0.89	0.30	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	22.7	18.5	32.6	25.7	20.3	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.80	0.76	1.23	0.72	0.66	0.44	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.7	1.3	0.2	4.6	7.7	1.1	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	43.8	18.6	23.0	28.2	24.8	10.0	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	C	C	C	B	D	C	C	D	D	C
Approach Delay (s)		23.2			22.4			32.5			35.9	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.8			HCM Level of Service		C					
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)		12.0					
Intersection Capacity Utilization		74.7%			ICU Level of Service		D					
Analysis Period (min)		15										
c Critical Lane Group												
























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↰	↑↑	↱		↕		↰	↱	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.95		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4837		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4837		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1219	590	68	1329	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1283	621	72	1399	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	103	0	0	0	0	0	12	0	0	0	21
Lane Group Flow (vph)	0	1801	0	72	1399	209	0	13	0	370	370	348
Turn Type	Prot			Free			Perm			Perm		
Protected Phases	4			3			2			6		
Permitted Phases				Free			2			6		
Actuated Green, G (s)	35.4			4.8			26.3			26.3		
Effective Green, g (s)	35.9			5.3			26.8			26.8		
Actuated g/C Ratio	0.45			0.07			0.34			0.34		
Clearance Time (s)	4.5			4.5			4.5			4.5		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	2171			117			2000			1583		
v/s Ratio Prot	c0.37			0.04			c0.40					
v/s Ratio Perm							0.13			0.01		
v/c Ratio	0.83			0.62			0.70			0.13		
Uniform Delay, d1	19.4			36.4			12.5			0.0		
Progression Factor	0.32			0.94			1.41			1.00		
Incremental Delay, d2	2.9			8.0			1.8			0.1		
Delay (s)	9.1			42.2			19.4			0.1		
Level of Service	A			D			B			A		
Approach Delay (s)	9.1			18.0			17.9			36.0		
Approach LOS	A			B			B			D		
Intersection Summary												
HCM Average Control Delay	18.6			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.86											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	76.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.81	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1483	
Volume (vph)	17	1642	273	0	997	350	596	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1728	287	0	1049	368	627	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1728	287	0	1049	368	627	160	160	0	16	0
Turn Type	Prot		Free		Free		Perm		Perm		Perm	
Protected Phases	7		4		8		2				6	
Permitted Phases			Free		Free		2		2		6	
Actuated Green, G (s)	2.2		47.6		80.0		23.4		23.4		23.4	
Effective Green, g (s)	2.7		48.1		80.0		23.9		23.9		23.9	
Actuated g/C Ratio	0.03		0.60		1.00		0.30		0.30		0.30	
Clearance Time (s)	4.5		4.5		4.5		4.5		4.5		4.5	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	60		3853		1583		805		449		443	
v/s Ratio Prot	0.01		c0.27		0.21		0.11					
v/s Ratio Perm			0.18		0.23		c0.23		0.11		0.01	
v/c Ratio	0.30		0.45		0.18		0.23		0.36		0.04	
Uniform Delay, d1	37.7		8.7		0.0		25.6		22.0		19.9	
Progression Factor	1.02		0.97		1.00		1.00		1.00		1.00	
Incremental Delay, d2	1.5		0.2		0.1		4.8		0.5		0.0	
Delay (s)	40.1		8.7		0.1		30.4		22.5		19.9	
Level of Service	D		A		A		C		C		B	
Approach Delay (s)	7.8		9.1		27.7		19.9					
Approach LOS	A		A		C		B					
Intersection Summary												
HCM Average Control Delay	12.5			HCM Level of Service					B			
HCM Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					8.0			
Intersection Capacity Utilization	49.8%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												
























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1149	545	141	783	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1209	574	148	824	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	332	0	37	0	0	0	192	0	0	165
Lane Group Flow (vph)	284	1209	242	148	966	0	226	475	44	107	242	28
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.5	32.6	32.6	7.5	28.6		15.2	15.2	15.2	11.7	11.7	11.7
Effective Green, g (s)	12.0	33.1	33.1	8.0	29.1		15.7	15.7	15.7	12.2	12.2	12.2
Actuated g/C Ratio	0.14	0.39	0.39	0.09	0.34		0.18	0.18	0.18	0.14	0.14	0.14
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	485	1378	616	167	1694		297	615	292	231	487	227
v/s Ratio Prot	0.08	c0.34		c0.08	0.20		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.15						0.03			0.02
v/c Ratio	0.59	0.88	0.39	0.89	0.57		0.76	0.77	0.15	0.46	0.50	0.12
Uniform Delay, d1	34.2	24.1	18.7	38.1	22.8		32.9	33.0	29.1	33.4	33.6	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	8.1	1.9	38.7	1.4		10.9	6.0	0.2	1.5	0.8	0.2
Delay (s)	36.0	32.2	20.6	76.7	24.2		43.8	38.9	29.3	34.9	34.4	32.0
Level of Service	D	C	C	E	C		D	D	C	C	C	C
Approach Delay (s)		29.5			31.0			37.7			33.6	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay	32.0			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	85.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	71.9%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												










22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	162	321	494	108	148	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	171	338	520	114	156	360	231
RTOR Reduction (vph)	0	67	0	0	0	131	0	0	75	0	0	174
Lane Group Flow (vph)	140	655	0	135	620	40	338	520	39	156	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.09	0.19	
v/s Ratio Perm						0.03			0.02			0.04
v/c Ratio	0.92	0.82		0.88	0.75	0.11	0.94	0.81	0.07	0.87	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	20.8	27.3	20.5	15.2	30.7	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.1	33.1	10.4	0.3	34.0	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	20.9	60.4	30.9	15.4	64.7	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	E	D	C
Approach Delay (s)	39.7			33.2			39.4			38.1		
Approach LOS	D			C			D			D		
Intersection Summary												
HCM Average Control Delay	37.6			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	69.3			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	76.0%			ICU Level of Service					D			
Analysis Period (min)	15											
c Critical Lane Group												








23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3515		1770	3539	1583	1770	1660		1770	1649	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3515		1770	3539	1583	1770	1660		1770	1649	
Volume (vph)	102	677	32	53	797	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	713	34	56	839	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	0	128	0	61	0	0	60	0
Lane Group Flow (vph)	107	744	0	56	839	223	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.21		0.03	c0.24		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm						0.14						
v/c Ratio	0.67	0.66		0.58	0.83	0.50	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.4		41.6	30.2	26.8	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.66	0.57	0.20	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.1		7.9	7.3	3.5	22.4	1.0		5.7	0.1	
Delay (s)	50.4	29.4		35.3	24.6	9.0	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		32.1			20.7			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		27.0							C			
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		90.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		73.0%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						0.97	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539						3433	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1583	1770	3539						3433	1583
Volume (vph)	0	819	413	99	959	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	435	104	1009	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	109	0	0	0	0	0	0	0	77	0
Lane Group Flow (vph)	0	862	326	104	1009	0	0	0	0	673	146	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06	c0.29					c0.20	0.09	
v/s Ratio Perm			0.21									
v/c Ratio		0.59	0.50	0.44	0.48					0.61	0.29	
Uniform Delay, d1		20.7	19.7	35.8	10.6					25.7	22.8	
Progression Factor		0.53	0.48	1.28	1.72					1.00	1.00	
Incremental Delay, d2		1.3	2.0	1.2	0.8					1.0	1.4	
Delay (s)		12.4	11.5	47.0	19.1					26.7	24.2	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		12.1			21.7				0.0		26.1	
Approach LOS		B			C				A		C	
Intersection Summary												
HCM Average Control Delay			19.1							B		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			61.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												






















25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	410	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	432	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	432	227
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	63.0			63.0	18.0	18.0
Effective Green, g (s)	63.5			63.5	18.5	18.5
Actuated g/C Ratio	0.71			0.71	0.21	0.21
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2497			2497	706	325
v/s Ratio Prot	c0.43			0.18	0.13	
v/s Ratio Perm						c0.14
v/c Ratio	0.62			0.26	0.61	0.70
Uniform Delay, d1	6.9			4.8	32.5	33.2
Progression Factor	0.32			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	1.6	6.4
Delay (s)	3.2			5.0	34.1	39.6
Level of Service	A			A	C	D
Approach Delay (s)	3.2			5.0	36.1	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay	11.4			HCM Level of Service		B
HCM Volume to Capacity ratio	0.63					
Actuated Cycle Length (s)	90.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	61.7%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1719			1850	1583	1770	3539	1583	1770	3536	
Flt Permitted		0.91			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1596			1797	1583	1770	3539	1583	1770	3536	
Volume (vph)	8	5	10	1	6	221	19	793	17	113	668	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	5	11	1	6	233	20	835	18	119	703	4
RTOR Reduction (vph)	0	9	0	0	0	195	0	9	0	0	0	0
Lane Group Flow (vph)	0	15	0	0	7	38	20	835	9	119	707	0
Turn Type	Perm			Perm			Perm		Prot		Perm	
Protected Phases	4			8			8		5		2	
Permitted Phases	4			8			8		2		1	
Actuated Green, G (s)	7.2			7.2			7.2		1.0		22.3	
Effective Green, g (s)	7.7			7.7			7.7		1.5		22.8	
Actuated g/C Ratio	0.16			0.16			0.16		0.03		0.49	
Clearance Time (s)	4.5			4.5			4.5		4.5		4.5	
Vehicle Extension (s)	3.0			3.0			3.0		3.0		3.0	
Lane Grp Cap (vph)	263			296			261		57		1728	
v/s Ratio Prot							0.01		c0.24		c0.07	
v/s Ratio Perm	0.01			0.00			c0.02		0.01		c0.20	
v/c Ratio	0.06			0.02			0.15		0.35		0.48	
Uniform Delay, d1	16.4			16.3			16.7		22.1		8.0	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	0.1			0.0			0.3		3.7		0.2	
Delay (s)	16.5			16.4			17.0		25.8		8.2	
Level of Service	B			B			B		C		A	
Approach Delay (s)	16.5			16.9			8.6		10.7			
Approach LOS	B			B			A		B			
Intersection Summary												
HCM Average Control Delay	10.6			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.47											
Actuated Cycle Length (s)	46.7			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	48.9%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	134	3	3	226	2	1	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	141	3	3	238	2	1	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	240			144			391	391	143	391	392	239
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	240			144			391	391	143	391	392	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1327			1438			566	543	905	566	543	800
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	145	243	2	1								
Volume Left	1	3	1	0								
Volume Right	3	2	1	0								
cSH	1327	1438	697	543								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.1	10.2	11.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.2	11.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay		0.2										
Intersection Capacity Utilization		24.0%			ICU Level of Service		A					
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	119	2	4	235	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	125	2	4	247	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	256			127			389	393	126	393	389	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	256			127			389	393	126	393	389	252
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1309			1459			567	541	924	557	544	787
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	128	260	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1309	1459	544	592								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.1	11.7	11.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	11.7	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay		0.6										
Intersection Capacity Utilization		25.4%			ICU Level of Service		A					
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel










2008 + Alternative A (Mitigated)
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	150	5	2	287	14	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	5	2	302	15	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			163		467	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		467	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1415		553	885
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	163	304	21			
Volume Left	0	2	15			
Volume Right	5	0	6			
cSH	1700	1415	623			
Volume to Capacity	0.10	0.00	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.1	11.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		26.7%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	4	10	252	0	38	0	11	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	4	11	265	0	40	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	265			167			452	452	165	463	454	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			167			452	452	165	463	454	265
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			92	100	99	100	100	100
cM capacity (veh/h)	1299			1410			515	500	879	499	498	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	167	276	52	0								
Volume Left	0	11	40	0								
Volume Right	4	0	12	0								
cSH	1299	1410	568	1700								
Volume to Capacity	0.00	0.01	0.09	0.00								
Queue Length 95th (ft)	0	1	7	0								
Control Delay (s)	0.0	0.4	12.0	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	12.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization		31.4%		ICU Level of Service	A							
Analysis Period (min)		15										

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	143	20	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	151	21	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1405		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	247	34			
Volume Left	0	0	34			
Volume Right	21	0	0			
cSH	1700	1405	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

1: Wilfred Avenue & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	158	163	12	916	195	547
v/c Ratio	0.08	0.70	0.44	0.10	0.92	0.78	0.42
Control Delay	18.9	50.5	14.8	43.7	34.2	59.4	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	50.5	14.8	43.7	34.2	59.4	7.1
Queue Length 50th (ft)	4	83	20	6	429	108	97
Queue Length 95th (ft)	24	#154	74	24	#726	#225	232
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	357	275	419	121	1044	264	1334
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.57	0.39	0.10	0.88	0.74	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Avenue & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↖	→	↘	←	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	16	307	376	318	52	560	22
v/c Ratio	0.15	0.34	0.80	0.23	0.27	0.82	0.12
Control Delay	48.1	19.7	39.0	4.0	40.0	14.0	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	19.7	39.0	4.0	40.0	14.0	31.5
Queue Length 50th (ft)	10	98	240	13	32	1	12
Queue Length 95th (ft)	31	255	270	150	m56	m83	m28
Internal Link Dist (ft)		1080		1070	1920		2200
Turn Bay Length (ft)							
Base Capacity (vph)	106	905	570	1407	495	867	471
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.34	0.66	0.23	0.11	0.65	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↗	→	↘	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	12	807	86	690	116	23
v/c Ratio	0.10	0.61	0.52	0.46	0.54	0.17
Control Delay	49.7	7.8	47.8	2.9	26.3	35.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	49.7	7.8	47.8	3.1	26.3	35.5
Queue Length 50th (ft)	6	287	56	32	23	10
Queue Length 95th (ft)	m14	156	m93	m52	74	33
Internal Link Dist (ft)		1070		550	687	2220
Turn Bay Length (ft)						
Base Capacity (vph)	120	1327	177	1498	338	258
Starvation Cap Reductn	0	0	0	261	0	0
Spillback Cap Reductn	0	22	0	0	1	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.62	0.49	0.56	0.34	0.09
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	717	71	189	485	569	181	162	281	447	244
v/c Ratio	0.34	0.90	0.10	0.85	0.53	0.54	0.81	0.32	0.60	0.93	0.80
Control Delay	52.7	34.4	5.3	75.7	22.6	3.7	70.1	39.4	11.0	65.5	50.2
Queue Delay	0.0	0.2	0.0	0.0	7.5	0.9	0.0	0.0	0.4	30.4	0.0
Total Delay	52.7	34.6	5.3	75.7	30.1	4.6	70.1	39.4	11.4	95.9	50.2
Queue Length 50th (ft)	36	190	1	121	225	0	113	47	2	147	128
Queue Length 95th (ft)	m60	#652	m19	#249	349	63	#224	78	74	#242	#237
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)							150		100		275
Base Capacity (vph)	292	801	719	223	907	1063	230	584	492	481	333
Starvation Cap Reductn	0	0	0	0	372	244	0	0	0	0	0
Spillback Cap Reductn	0	3	0	0	0	0	0	0	34	59	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.90	0.10	0.85	0.91	0.69	0.79	0.28	0.61	1.06	0.73
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	145	5	200	173	159	5	32	254
v/c Ratio	0.04	0.19	0.53	0.04	0.52	0.41	0.06	0.00	0.23	0.14
Control Delay	44.6	43.8	14.7	44.6	26.6	32.0	5.8	5.2	46.8	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	43.8	14.7	44.6	26.6	32.0	5.8	5.2	46.8	13.3
Queue Length 50th (ft)	3	19	0	3	32	77	15	0	20	38
Queue Length 95th (ft)	15	47	56	15	65	135	41	m2	48	79
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	230	438	483	230	846	425	2592	1161	230	1868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.07	0.30	0.02	0.24	0.41	0.06	0.00	0.14	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	857	586	98	592	344	996
v/c Ratio	0.51	0.66	0.38	0.29	0.66	0.96dr
Control Delay	16.5	13.2	40.0	10.7	30.3	25.5
Queue Delay	2.0	3.3	0.0	0.0	0.0	1.0
Total Delay	18.5	16.5	40.0	10.7	30.3	26.5
Queue Length 50th (ft)	157	118	26	91	160	182
Queue Length 95th (ft)	211	239	50	118	261	#281
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	889	257	2035	523	1187
Starvation Cap Reductn	639	206	0	0	0	0
Spillback Cap Reductn	0	0	0	148	0	55
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.86	0.38	0.31	0.66	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	566	711	431	426	171	171	612
v/c Ratio	0.47	0.77	0.84	0.28	0.49	0.49	0.58
Control Delay	17.5	8.9	49.2	15.0	36.6	36.6	14.1
Queue Delay	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	10.9	49.2	15.0	36.6	36.6	14.1
Queue Length 50th (ft)	51	16	109	68	89	89	67
Queue Length 95th (ft)	71	17	#183	100	m150	m150	115
Internal Link Dist (ft)	466		345		380		
Turn Bay Length (ft)			150		150		
Base Capacity (vph)	1208	918	515	1548	347	347	1061
Starvation Cap Reductn	0	97	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.87	0.84	0.28	0.49	0.49	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel










2008 + Alternative A (Mitigated)
PM Peak

	↖	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	197	975	683	98	228
v/c Ratio	0.21	0.43	0.58	0.20	0.38
Control Delay	29.0	9.4	29.4	29.3	5.9
Queue Delay	0.0	0.9	0.0	0.0	0.0
Total Delay	29.0	10.3	29.4	29.3	5.9
Queue Length 50th (ft)	50	144	185	48	0
Queue Length 95th (ft)	79	184	244	90	55
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	927	2286	1184	485	599
Starvation Cap Reductn	0	949	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.73	0.58	0.20	0.38

Intersection Summary







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	224	226	377	16	541	502	7	429	715
v/c Ratio	0.65	0.65	0.60	0.11	1.02	0.22	0.05	0.39	0.74
Control Delay	37.3	37.4	7.3	29.3	74.3	9.4	23.6	31.7	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Total Delay	37.3	37.4	7.3	29.3	74.3	9.4	23.6	31.7	15.3
Queue Length 50th (ft)	108	109	0	5	~278	40	4	84	130
Queue Length 95th (ft)	171	172	63	23	#478	142	m4	m#163	m#294
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	694	179	531	2241	177	1110	966
Starvation Cap Reductn	0	0	0	0	0	0	0	0	108
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.51	0.54	0.09	1.02	0.22	0.04	0.39	0.83
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	301	637	264	223	498
v/c Ratio	0.70	0.52	0.79	0.32	0.80	0.41
Control Delay	32.9	6.5	25.6	3.0	50.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	6.5	25.6	3.0	50.2	6.8
Queue Length 50th (ft)	96	0	211	0	86	82
Queue Length 95th (ft)	168	54	#394	38	#194	139
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	617	805	834	281	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.49	0.79	0.32	0.79	0.41
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	632	38	213	605	483	67	97	85	390	382
v/c Ratio	0.40	0.86	0.11	0.71	0.63	0.62	0.09	0.24	0.22	0.81	0.78
Control Delay	44.6	43.6	9.9	44.2	15.8	4.6	25.8	11.2	8.0	41.6	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	43.6	9.9	44.2	15.8	4.6	25.8	11.2	8.0	41.6	37.5
Queue Length 50th (ft)	26	160	0	41	64	0	13	8	0	189	172
Queue Length 95th (ft)	61	#245	23	m56	m111	m3	29	48	36	#340	#316
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	300	959	781	744	398	393	483	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.84	0.10	0.71	0.63	0.62	0.09	0.24	0.22	0.81	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	1077	154	391	1012	377	144	435	274	383	278	256
v/c Ratio	0.87	0.64	0.25	0.76	0.89	0.51	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	50.3	18.8	5.3	32.0	26.4	3.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	18.8	5.3	32.0	26.4	3.7	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	87	130	13	103	270	26	71	74	0	95	129	0
Queue Length 95th (ft) m#165	m167	m20	#154	#364	36	#157	118	65	#188	#230	58	
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1142	737	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.64	0.25	0.76	0.89	0.51	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1904	72	1399	209	25	370	370	369
v/c Ratio	0.82	0.51	0.70	0.13	0.05	0.84	0.88	0.67
Control Delay	9.3	45.4	20.7	0.2	9.8	43.2	48.5	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	45.4	20.7	0.2	9.8	43.2	48.5	27.0
Queue Length 50th (ft)	121	32	342	0	2	169	172	136
Queue Length 95th (ft)	#415	m61	474	m0	18	#318	#329	228
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2326	142	2000	1583	568	475	455	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.51	0.70	0.13	0.04	0.78	0.81	0.62
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1728	287	1049	368	627	161	161	18
v/c Ratio	0.14	0.45	0.18	0.37	0.23	0.78	0.36	0.36	0.04
Control Delay	37.0	9.6	0.1	12.8	0.3	32.3	22.5	22.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	9.6	0.1	12.8	0.3	32.3	22.5	22.5	14.8
Queue Length 50th (ft)	10	165	0	86	0	147	65	65	5
Queue Length 95th (ft)	m12	m213	m0	190	0	173	100	100	17
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3856	1583	2805	1583	1415	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	106	0	0	0	0	38	38	39
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46	0.18	0.37	0.23	0.44	0.21	0.21	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1209	574	148	1003	226	475	236	107	242	193
v/c Ratio	0.58	0.88	0.61	0.89	0.58	0.76	0.77	0.49	0.47	0.50	0.49
Control Delay	40.4	33.8	5.6	86.9	23.7	51.5	43.0	8.3	40.4	37.3	9.8
Queue Delay	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	38.3	5.7	86.9	23.7	51.5	43.0	8.3	40.4	37.3	9.8
Queue Length 50th (ft)	74	311	10	80	150	126	132	0	59	67	0
Queue Length 95th (ft)	121	#481	90	#202	209	#258	#214	61	113	104	56
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	486	1377	948	167	1729	310	641	496	298	627	450
Starvation Cap Reductn	0	116	13	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.96	0.61	0.89	0.58	0.73	0.74	0.48	0.36	0.39	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	171	338	520	114	156	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.34	0.95	0.81	0.18	0.87	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	76.0	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	76.0	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	68	146	0
Queue Length 95th (ft)	#162	#221	#155	184	43	#296	#358	30	#169	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	514	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.33	0.95	0.81	0.18	0.87	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	↖	→	↙	←	↗	↘	↑	↖	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	747	56	839	351	51	91	511	132
v/c Ratio	0.67	0.61	0.47	0.78	0.58	0.43	0.44	0.80	0.18
Control Delay	64.2	29.9	39.0	24.2	6.6	52.2	21.8	35.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	29.9	39.0	24.2	6.6	52.2	21.8	35.9	5.8
Queue Length 50th (ft)	61	205	32	251	4	28	14	237	10
Queue Length 95th (ft)	#161	#299	m63	#356	19	65	57	#388	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	159	1232	118	1077	607	118	367	653	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.61	0.47	0.78	0.58	0.43	0.25	0.78	0.17
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	→	↙	↖	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	435	104	1009	673	223
v/c Ratio	0.58	0.56	0.40	0.48	0.61	0.38
Control Delay	12.8	8.2	47.7	19.4	28.6	13.6
Queue Delay	0.2	0.3	0.0	0.3	0.0	0.0
Total Delay	13.0	8.5	47.7	19.7	28.6	13.6
Queue Length 50th (ft)	124	65	58	241	164	45
Queue Length 95th (ft)	153	m101	m104	301	222	105
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	772	295	2084	1106	587
Starvation Cap Reductn	140	67	0	491	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.62	0.35	0.63	0.61	0.38
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative A (Mitigated)
PM Peak

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	432	248
v/c Ratio	0.62	0.26	0.61	0.71
Control Delay	3.6	5.8	35.5	40.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	5.8	35.5	40.6
Queue Length 50th (ft)	0	58	116	119
Queue Length 95th (ft)	243	112	144	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2495	2495	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.35	0.43
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel






















2008 + Alternative A (Mitigated)
PM Peak

	→	←	↖	↙	↑	↘	↗	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	7	233	20	835	18	119	707
v/c Ratio	0.08	0.02	0.49	0.09	0.49	0.02	0.46	0.34
Control Delay	12.4	15.1	7.0	21.7	10.5	5.2	23.7	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	15.1	7.0	21.7	10.5	5.2	23.7	6.3
Queue Length 50th (ft)	3	1	0	4	77	0	25	26
Queue Length 95th (ft)	17	9	42	21	147	9	72	115
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	553	603	678	212	1791	810	266	2139
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.01	0.34	0.09	0.47	0.02	0.45	0.33
Intersection Summary								

**CUMULATIVE 2020 + ALTERNATIVE A
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

















1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.92			1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1717			1786	1583	1770	1803		1770	1860	
Flt Permitted		1.00			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1717			1365	1583	1770	1803		1770	1860	
Volume (vph)	0	12	17	145	23	153	14	740	203	214	522	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	13	18	153	24	161	15	779	214	225	549	6
RTOR Reduction (vph)	0	15	0	0	0	61	0	8	0	0	0	0
Lane Group Flow (vph)	0	16	0	0	177	100	15	985	0	225	555	0
Turn Type	Perm		Perm		Perm		Prot		Prot			
Protected Phases	4				8		5		2		1 6	
Permitted Phases	4		8		8							
Actuated Green, G (s)	18.7				18.7		18.7		2.2		76.5	
Effective Green, g (s)	19.2				19.2		19.2		2.7		77.0	
Actuated g/C Ratio	0.15				0.15		0.15		0.02		0.59	
Clearance Time (s)	4.5				4.5		4.5		4.5		4.5	
Vehicle Extension (s)	3.0				3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	254				202		234		37		1068	
v/s Ratio Prot	0.01						0.01		c0.55		c0.13	
v/s Ratio Perm					c0.13		0.06					
v/c Ratio	0.06				0.88		0.43		0.41		0.92	
Uniform Delay, d1	47.7				54.2		50.4		62.9		23.8	
Progression Factor	1.00				1.00		1.00		0.87		0.70	
Incremental Delay, d2	0.1				31.8		1.3		4.9		10.5	
Delay (s)	47.8				86.0		51.7		59.6		27.3	
Level of Service	D				F		D		E		C	
Approach Delay (s)	47.8				69.7				27.7			
Approach LOS	D				E				C			
Intersection Summary												
HCM Average Control Delay	32.1				HCM Level of Service				C			
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	130.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	89.1%				ICU Level of Service				E			
Analysis Period (min)	15											
c Critical Lane Group												























2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	25	384	20	8	302	10	10	10	10	9	9	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	404	21	8	318	11	11	11	11	9	9	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)	1210											
pX, platoon unblocked												
vC, conflicting volume	328			425			823	813	415	823	818	323
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	328			425			823	813	415	823	818	323
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			96	97	98	97	97	99
cM capacity (veh/h)	1231			1134			275	304	638	274	302	718
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	452	337	32	29								
Volume Left	26	8	11	9								
Volume Right	21	11	11	11								
cSH	1231	1134	353	365								
Volume to Capacity	0.02	0.01	0.09	0.08								
Queue Length 95th (ft)	2	1	7	7								
Control Delay (s)	0.7	0.3	16.2	15.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	0.3	16.2	15.7								
Approach LOS				C	C							
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization	43.5%		ICU Level of Service					A				
Analysis Period (min)	15											




















3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	         											
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	11	381	11	11	302	25	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	401	12	12	318	26	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)	1160											
pX, platoon unblocked												
vC, conflicting volume	344			413			800	797	407	800	790	331
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	344			413			800	797	407	800	790	331
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	98	96	97	99
cM capacity (veh/h)	1215			1146			287	313	644	286	316	711
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	424	356	32	32								
Volume Left	12	12	11	11								
Volume Right	12	26	11	11								
cSH	1215	1146	364	372								
Volume to Capacity	0.01	0.01	0.09	0.08								
Queue Length 95th (ft)	1	1	7	7								
Control Delay (s)	0.3	0.4	15.8	15.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.4	15.8	15.6								
Approach LOS				C	C							
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization	35.3%		ICU Level of Service			A						
Analysis Period (min)			15									









4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt		0.95		1.00	1.00	0.85	1.00	0.87			0.95	
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)		1753		1770	1863	1583	1770	1613			1738	
Flt Permitted		0.95		0.95	1.00	1.00	0.95	1.00			0.83	
Satd. Flow (perm)		1667		1770	1863	1583	1770	1613			1477	
Volume (vph)	44	196	160	111	205	32	116	19	158	23	10	17
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	206	168	117	216	34	122	20	166	24	11	18
RTOR Reduction (vph)	0	23	0	0	0	15	0	106	0	0	15	0
Lane Group Flow (vph)	0	397	0	117	216	19	122	80	0	0	38	0
Turn Type	Perm			Prot		Perm		Prot		Perm		
Protected Phases	4			3		8		5		2		6
Permitted Phases	4					8				6		
Actuated Green, G (s)	40.1			10.9		55.5		13.5		35.5		17.5
Effective Green, g (s)	40.6			11.4		56.0		14.0		36.0		18.0
Actuated g/C Ratio	0.41			0.11		0.56		0.14		0.36		0.18
Clearance Time (s)	4.5			4.5		4.5		4.5		4.5		4.5
Vehicle Extension (s)	3.0			3.0		3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	677			202		1043		886		248		581
v/s Ratio Prot				c0.07		0.12		c0.07		c0.05		
v/s Ratio Perm	c0.24					0.01						0.03
v/c Ratio	0.59			0.58		0.21		0.02		0.49		0.14
Uniform Delay, d1	23.2			42.0		10.9		9.8		39.7		21.5
Progression Factor	1.00			0.78		0.50		0.17		1.00		1.00
Incremental Delay, d2	3.7			4.0		0.4		0.0		1.5		0.5
Delay (s)	26.8			36.6		6.0		1.7		41.3		22.0
Level of Service	C			D		A		A		D		C
Approach Delay (s)	26.8			15.3		29.6		35.6				
Approach LOS	C			B		C		D				
Intersection Summary												
HCM Average Control Delay	24.3			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	60.7%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												









5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.97			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.96	
Satd. Flow (prot)	1770	3436		1770	3430			1805	1583		1779	
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.69	
Satd. Flow (perm)	1770	3436		1770	3430			1490	1583		1283	
Volume (vph)	20	288	69	419	289	75	55	31	695	65	11	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	303	73	441	304	79	58	33	732	68	12	4
RTOR Reduction (vph)	0	17	0	0	14	0	0	0	619	0	3	0
Lane Group Flow (vph)	21	359	0	441	369	0	0	91	113	0	81	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2		2		6		
Actuated Green, G (s)	3.2	34.3		37.2	68.3			15.0	15.0		15.0	
Effective Green, g (s)	3.7	34.8		37.7	68.8			15.5	15.5		15.5	
Actuated g/C Ratio	0.04	0.35		0.38	0.69			0.16	0.16		0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	65	1196		667	2360			231	245		199	
v/s Ratio Prot	0.01	c0.10		c0.25	0.11							
v/s Ratio Perm								0.06	c0.07		0.06	
v/c Ratio	0.32	0.30		0.66	0.16			0.39	0.46		0.41	
Uniform Delay, d1	46.9	23.7		25.8	5.5			38.0	38.5		38.1	
Progression Factor	0.86	0.57		0.72	0.30			1.00	1.00		1.00	
Incremental Delay, d2	2.6	0.6		2.2	0.1			1.1	1.4		1.4	
Delay (s)	43.1	14.1		20.9	1.8			39.1	39.8		39.5	
Level of Service	D	B		C	A			D	D		D	
Approach Delay (s)		15.6			12.0			39.8			39.5	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM Average Control Delay		24.5			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		67.6%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												













6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.98			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	3445		1770	3469			1676			1731	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.48	
Satd. Flow (perm)	1770	3445		1770	3469			1536			856	
Volume (vph)	23	843	182	327	639	98	98	67	352	76	15	46
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	887	192	344	673	103	103	71	371	80	16	48
RTOR Reduction (vph)	0	19	0	0	11	0	0	78	0	0	18	0
Lane Group Flow (vph)	24	1060	0	344	765	0	0	467	0	0	126	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2		6		6		
Actuated Green, G (s)	2.2	32.1		23.0	52.9			31.4			31.4	
Effective Green, g (s)	2.7	32.6		23.5	53.4			31.9			31.9	
Actuated g/C Ratio	0.03	0.33		0.24	0.53			0.32			0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	48	1123		416	1852			490			273	
v/s Ratio Prot	0.01	c0.31		c0.19	0.22							
v/s Ratio Perm								c0.30			0.15	
v/c Ratio	0.50	0.94		0.83	0.41			0.95			0.46	
Uniform Delay, d1	48.0	32.8		36.3	13.9			33.3			27.2	
Progression Factor	0.93	0.82		1.00	1.00			1.00			1.00	
Incremental Delay, d2	5.9	13.1		12.7	0.7			28.8			1.2	
Delay (s)	50.5	40.0		49.0	14.6			62.1			28.4	
Level of Service	D	D		D	B			E			C	
Approach Delay (s)		40.2			25.2			62.1			28.4	
Approach LOS		D			C			E			C	
Intersection Summary												
HCM Average Control Delay		37.9			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		88.3%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	3539	1583	1770	3539	1583	3433	1702	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	3539	1583	1770	3539	1583	3433	1702	
Volume (vph)	79	1038	156	235	810	529	184	40	350	553	52	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	1093	164	247	853	557	194	42	368	582	55	75
RTOR Reduction (vph)	0	0	71	0	0	316	0	0	247	0	58	0
Lane Group Flow (vph)	83	1093	93	247	853	241	194	42	121	582	72	0
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Perm	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	8.2	33.3	33.3	13.3	38.4	38.4	12.0	10.9	10.9	14.5	13.4	
Effective Green, g (s)	8.7	33.8	33.8	13.8	38.9	38.9	12.5	11.4	11.4	15.0	13.9	
Actuated g/C Ratio	0.10	0.38	0.38	0.15	0.43	0.43	0.14	0.13	0.13	0.17	0.15	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	171	1273	541	271	1530	684	246	448	201	572	263	
v/s Ratio Prot	0.05	c0.32		c0.14	0.24		0.11	0.01		c0.17	0.04	
v/s Ratio Perm			0.06			0.15			c0.08			
v/c Ratio	0.49	0.86	0.17	0.91	0.56	0.35	0.79	0.09	0.60	1.02	0.27	
Uniform Delay, d1	38.5	25.9	18.8	37.5	19.1	17.1	37.5	34.7	37.2	37.5	33.6	
Progression Factor	1.00	1.00	1.00	1.04	1.06	2.04	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	6.0	0.2	25.4	1.0	1.0	15.3	0.1	5.0	42.1	0.6	
Delay (s)	40.7	31.9	18.9	64.4	21.2	35.9	52.8	34.8	42.1	79.6	34.1	
Level of Service	D	C	B	E	C	D	D	C	D	E	C	
Approach Delay (s)		30.8			32.6			45.1			71.3	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		40.2			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		77.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												












9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3390	1441	3433	3539					1610	3037	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3390	1441	3433	3539					1610	3037	
Volume (vph)	0	1276	663	85	805	0	0	0	0	424	339	769
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1343	698	89	847	0	0	0	0	446	357	809
RTOR Reduction (vph)	0	0	171	0	0	0	0	0	0	0	83	0
Lane Group Flow (vph)	0	1343	527	89	847	0	0	0	0	446	1083	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3	8						6	
Permitted Phases			4									
Actuated Green, G (s)		38.6	38.6	4.4	47.5					33.5	33.5	
Effective Green, g (s)		39.1	39.1	4.9	48.0					34.0	34.0	
Actuated g/C Ratio		0.43	0.43	0.05	0.53					0.38	0.38	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1473	626	187	1887					608	1147	
v/s Ratio Prot		c0.40		0.03	c0.24							
v/s Ratio Perm			0.37							0.28	0.36	
v/c Ratio		0.91	0.84	0.48	0.45					0.73	1.24dr	
Uniform Delay, d1		23.8	22.7	41.3	12.9					24.1	27.1	
Progression Factor		0.68	0.54	0.62	0.25					1.00	1.00	
Incremental Delay, d2		4.9	6.2	1.6	0.7					7.7	16.1	
Delay (s)		21.1	18.5	27.0	3.9					31.8	43.2	
Level of Service		C	B	C	A					C	D	
Approach Delay (s)		20.2			6.1			0.0			40.0	
Approach LOS		C			A			A			D	
Intersection Summary												
HCM Average Control Delay		24.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		79.9%			ICU Level of Service			D				
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												























11: Golf Course & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	180	1218	770	57	137	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	1282	811	60	144	96
RTOR Reduction (vph)	0	0	6	0	0	71
Lane Group Flow (vph)	189	1282	865	0	144	25
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.5	58.0	44.0		23.0	23.0
Effective Green, g (s)	10.0	58.5	44.5		23.5	23.5
Actuated g/C Ratio	0.11	0.65	0.49		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	381	2300	1732		462	413
v/s Ratio Prot	0.06	c0.36	0.25		c0.08	
v/s Ratio Perm						0.02
v/c Ratio	0.50	0.56	0.50		0.31	0.06
Uniform Delay, d1	37.6	8.6	15.3		26.7	25.0
Progression Factor	1.27	0.12	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	1.0		1.8	0.3
Delay (s)	48.4	1.6	16.3		28.5	25.2
Level of Service	D	A	B		C	C
Approach Delay (s)		7.6	16.3		27.2	
Approach LOS		A	B		C	
Intersection Summary						
HCM Average Control Delay		12.4		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.49				
Actuated Cycle Length (s)		90.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		47.9%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Wilfred Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1863	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1863	1583	3433	3539	1583	3433	1863	1583
Volume (vph)	195	371	426	66	112	411	557	280	203	819	328	554
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	391	448	69	118	433	586	295	214	862	345	583
RTOR Reduction (vph)	0	0	228	0	0	325	0	0	172	0	0	0
Lane Group Flow (vph)	205	391	220	69	118	108	586	295	42	862	345	583
Turn Type	Prot		Perm		Prot		Perm		Prot		Free	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			Free
Actuated Green, G (s)	7.6	23.6	23.6	6.0	22.0	22.0	17.2	17.2	17.2	25.2	25.2	90.0
Effective Green, g (s)	8.1	24.1	24.1	6.5	22.5	22.5	17.7	17.7	17.7	25.7	25.7	90.0
Actuated g/C Ratio	0.09	0.27	0.27	0.07	0.25	0.25	0.20	0.20	0.20	0.29	0.29	1.00
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	309	499	424	128	466	396	675	696	311	980	532	1583
v/s Ratio Prot	0.06	c0.21		0.04	0.06		0.17	0.08		c0.25	c0.19	
v/s Ratio Perm			0.14			0.07			0.03			c0.37
v/c Ratio	0.66	0.78	0.52	0.54	0.25	0.27	0.87	0.42	0.14	0.88	0.65	0.37
Uniform Delay, d1	39.6	30.5	28.0	40.3	27.0	27.2	35.0	31.7	29.8	30.7	28.2	0.0
Progression Factor	1.00	1.00	1.00	0.63	0.53	0.63	1.00	1.00	1.00	1.01	0.52	1.00
Incremental Delay, d2	5.3	7.9	1.1	3.9	0.3	0.3	11.4	1.9	0.9	4.8	3.0	0.3
Delay (s)	44.9	38.4	29.1	29.4	14.7	17.4	46.4	33.6	30.7	36.0	17.7	0.3
Level of Service	D	D	C	C	B	B	D	C	C	D	B	A
Approach Delay (s)		35.7			18.2			39.9			20.8	
Approach LOS		D			B			D			C	
Intersection Summary												
HCM Average Control Delay			28.5		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			69.7%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	961	0	0	684
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	1012	0	0	720
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						1034
pX, platoon unblocked	0.88					
vC, conflicting volume	1732	1012			1012	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1829	1012			1012	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	74	291			685	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	1012	720			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.60	0.42			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		53.9%		ICU Level of Service	A	
Analysis Period (min)		15				

14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Volume (veh/h)	305	73	45	318	0	322
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	321	77	47	335	0	339
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	382				934	215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	382				934	215
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	73				100	59
cM capacity (veh/h)	1176				215	825
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	398	382	339			
Volume Left	321	0	0			
Volume Right	0	335	339			
cSH	1176	1700	825			
Volume to Capacity	0.27	0.22	0.41			
Queue Length 95th (ft)	28	0	51			
Control Delay (s)	7.9	0.0	12.4			
Lane LOS	A		B			
Approach Delay (s)	7.9	0.0	12.4			
Approach LOS			B			
Intersection Summary						
Average Delay			6.6			
Intersection Capacity Utilization		72.7%		ICU Level of Service	C	
Analysis Period (min)		15				

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↱	↱
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	197	32	13	429	373	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	207	34	14	452	393	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	663	213	426			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	663	213	426			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	47	96	99			
cM capacity (veh/h)	390	792	1129			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	207	34	14	226	226	262 165
Volume Left	207	0	14	0	0	0 0
Volume Right	0	34	0	0	0	0 34
cSH	390	792	1129	1700	1700	1700 1700
Volume to Capacity	0.53	0.04	0.01	0.13	0.13	0.15 0.10
Queue Length 95th (ft)	75	3	1	0	0	0 0
Control Delay (s)	24.3	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	22.2		0.2			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization			29.4%		ICU Level of Service	A
Analysis Period (min)			15			

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	299	372	589	285	228	463
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	315	392	620	300	240	487
RTOR Reduction (vph)	0	303	0	174	0	0
Lane Group Flow (vph)	315	89	620	126	240	487
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1 6	
Permitted Phases	8		2			
Actuated Green, G (s)	14.3	14.3	26.7	26.7	10.5	41.7
Effective Green, g (s)	14.8	14.8	27.2	27.2	11.0	42.2
Actuated g/C Ratio	0.23	0.23	0.42	0.42	0.17	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	403	360	780	662	300	1210
v/s Ratio Prot	c0.18		c0.33		c0.14	
v/s Ratio Perm	0.06		0.08			
v/c Ratio	0.78	0.25	0.79	0.19	0.80	0.40
Uniform Delay, d1	23.6	20.5	16.5	11.9	25.9	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.82
Incremental Delay, d2	9.5	0.4	8.2	0.6	12.7	0.9
Delay (s)	33.1	20.9	24.7	12.6	38.6	5.3
Level of Service	C	C	C	B	D	A
Approach Delay (s)	26.3		20.7			16.3
Approach LOS	C		C			B
Intersection Summary						
HCM Average Control Delay			21.1		HCM Level of Service	C
HCM Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			65.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			70.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	0.95	0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1681	1646	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1681	1646	
Volume (vph)	58	539	45	122	584	410	69	17	123	570	48	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	567	47	128	615	432	73	18	129	600	51	109
RTOR Reduction (vph)	0	0	36	0	0	329	0	47	54	0	19	0
Lane Group Flow (vph)	61	567	11	128	615	103	73	31	15	383	358	0
Turn Type	Prot	Perm	Prot	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases			4		8			2				
Actuated Green, G (s)	4.4	18.6	18.6	4.4	18.6	18.6	16.5	16.5	16.5	22.5	22.5	
Effective Green, g (s)	4.9	19.1	19.1	4.9	19.1	19.1	17.0	17.0	17.0	23.0	23.0	
Actuated g/C Ratio	0.06	0.24	0.24	0.06	0.24	0.24	0.21	0.21	0.21	0.29	0.29	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	845	378	210	845	378	730	333	320	483	473	
v/s Ratio Prot	0.03	c0.16		0.04	c0.17		c0.02	0.02		c0.23	0.22	
v/s Ratio Perm			0.01			0.07			0.01			
v/c Ratio	0.56	0.67	0.03	0.61	0.73	0.27	0.10	0.09	0.05	0.79	0.76	
Uniform Delay, d1	36.5	27.6	23.3	36.6	28.1	24.8	25.3	25.3	25.1	26.3	26.0	
Progression Factor	1.00	1.00	1.00	0.87	0.52	1.02	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	4.2	0.1	3.8	4.2	1.3	0.3	0.5	0.3	12.6	10.8	
Delay (s)	43.1	31.8	23.5	35.7	18.9	26.7	25.6	25.9	25.3	38.9	36.8	
Level of Service	D	C	C	D	B	C	C	C	C	D	D	
Approach Delay (s)		32.3			23.6			25.6			37.8	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay		29.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		56.4%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3150	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3150	1441	3433	1863	1583
Volume (vph)	209	905	118	448	766	408	122	228	464	439	210	228
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	220	953	124	472	806	429	128	240	488	462	221	240
RTOR Reduction (vph)	0	0	88	0	0	271	0	181	230	0	0	196
Lane Group Flow (vph)	220	953	36	472	806	158	128	274	43	462	221	44
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4		8				2			6
Actuated Green, G (s)	11.8	22.8	22.8	13.6	24.6	24.6	11.3	12.1	12.1	13.5	14.3	14.3
Effective Green, g (s)	12.3	23.3	23.3	14.1	25.1	25.1	11.8	12.6	12.6	14.0	14.8	14.8
Actuated g/C Ratio	0.15	0.29	0.29	0.18	0.31	0.31	0.15	0.16	0.16	0.18	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272	1481	461	605	1110	497	261	496	227	601	345	293
v/s Ratio Prot	c0.12	0.19		0.14	c0.23		0.07	0.09		c0.13	c0.12	
v/s Ratio Perm			0.02			0.10			0.03			0.03
v/c Ratio	0.81	0.64	0.08	0.78	0.73	0.32	0.49	0.55	0.19	0.77	0.64	0.15
Uniform Delay, d1	32.7	24.7	20.6	31.5	24.4	20.9	31.3	31.1	29.3	31.5	30.1	27.3
Progression Factor	0.77	0.70	1.10	0.76	0.69	0.89	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.4	1.6	0.2	4.9	3.1	1.3	1.5	1.3	0.4	5.9	4.0	0.2
Delay (s)	37.6	19.0	22.9	28.8	20.1	19.8	32.8	32.4	29.7	37.3	34.2	27.6
Level of Service	D	B	C	C	C	B	C	C	C	D	C	C
Approach Delay (s)		22.5			22.4			31.6			34.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		26.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		69.9%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2020 + Alternative A (Mitigated)

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑↑↑	↑↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt	0.95	1.00	1.00	0.85	1.00	0.85	0.90	1.00	1.00	0.85	0.85	0.85
Flt Protected	1.00	0.95	1.00	1.00	1.00	0.99	0.99	0.95	0.95	1.00	1.00	1.00
Satd. Flow (prot)	4816	1770	3539	1583	1583	1653	1681	1681	1583	1583	1583	1583
Flt Permitted	1.00	0.95	1.00	1.00	1.00	0.92	0.74	0.74	0.74	1.00	1.00	1.00
Satd. Flow (perm)	4816	1770	3539	1583	1583	1540	1312	1312	1312	1583	1583	1583
Volume (vph)	0	1169	639	78	1293	234	6	0	17	692	0	323
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1231	673	82	1361	246	6	0	18	728	0	340
RTOR Reduction (vph)	0	115	0	0	0	0	0	12	0	0	0	27
Lane Group Flow (vph)	0	1789	0	82	1361	246	0	12	0	364	364	313
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases	4			3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)	36.6			4.9	46.0	80.0		25.0		25.0	25.0	25.0
Effective Green, g (s)	37.1			5.4	46.5	80.0		25.5		25.5	25.5	25.5
Actuated g/C Ratio	0.46			0.07	0.58	1.00		0.32		0.32	0.32	0.32
Clearance Time (s)	4.5			4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2233			119	2057	1583		491		418	418	505
v/s Ratio Prot	c0.37			0.05	c0.38							
v/s Ratio Perm						0.16		0.01		c0.28	0.28	0.20
v/c Ratio	0.80			0.69	0.66	0.16		0.02		0.87	0.87	0.62
Uniform Delay, d1	18.3			36.5	11.4	0.0		18.7		25.7	25.7	23.1
Progression Factor	0.24			1.13	0.46	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3			13.3	1.4	0.2		0.0		17.6	17.6	2.4
Delay (s)	6.8			54.4	6.7	0.2		18.7		43.3	43.3	25.5
Level of Service	A			D	A	A		B		D	D	C
Approach Delay (s)	6.8				8.1			18.7			37.7	
Approach LOS	A				A			B			D	
Intersection Summary												
HCM Average Control Delay		14.3										
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0						12.0				
Intersection Capacity Utilization		77.0%										
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2020 + Alternative A (Mitigated)
























Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	0.85	0.85	0.85	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	6408	1583	5085	1583	3433	1504	1504	1504	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	1.00	0.81	0.81	0.81
Satd. Flow (perm)	1770	6408	1583	5085	1583	2695	1504	1504	1504	1468	1468	1468
Volume (vph)	19	1356	504	0	988	343	614	0	376	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1427	531	0	1040	361	646	0	396	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	15	15	0	2	0	0
Lane Group Flow (vph)	20	1427	531	0	1040	361	646	183	183	0	16	0
Turn Type				Prot		Free		Free	Perm		Perm	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases					Free		Free	2		2		6
Actuated Green, G (s)	3.8	46.1	80.0		37.8	80.0	24.9	24.9	24.9		24.9	
Effective Green, g (s)	4.3	46.6	80.0		38.3	80.0	25.4	25.4	25.4		25.4	
Actuated g/C Ratio	0.05	0.58	1.00		0.48	1.00	0.32	0.32	0.32		0.32	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	95	3733	1583		2434	1583	856	478	478		466	
v/s Ratio Prot	0.01	0.22			c0.20			0.12				
v/s Ratio Perm			c0.34			0.23	c0.24		0.12		0.01	
v/c Ratio	0.21	0.38	0.34		0.43	0.23	0.75	0.38	0.38		0.03	
Uniform Delay, d1	36.2	9.0	0.0		13.7	0.0	24.5	21.2	21.2		18.8	
Progression Factor	1.19	1.38	1.00		0.80	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.2	0.3		0.4	0.2	3.8	0.5	0.5		0.0	
Delay (s)	43.9	12.6	0.3		11.4	0.2	28.3	21.7	21.7		18.9	
Level of Service	D	B	A		B	A	C	C	C		B	
Approach Delay (s)		9.6			8.5			25.8			18.9	
Approach LOS		A			A			C			B	
Intersection Summary												
HCM Average Control Delay		13.1										
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		80.0						8.0				
Intersection Capacity Utilization		48.5%										
Analysis Period (min)		15										
c Critical Lane Group												




























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Volume (vph)	269	931	547	195	768	268	390	348	317	180	313	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	980	576	205	808	282	411	366	334	189	329	182
RTOR Reduction (vph)	0	0	364	0	75	0	0	0	267	0	0	150
Lane Group Flow (vph)	283	980	212	205	1015	0	250	527	67	167	351	32
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	8.5	21.7	21.7	11.2	24.4		15.6	15.6	15.6	13.5	13.5	13.5
Effective Green, g (s)	9.0	22.2	22.2	11.7	24.9		16.1	16.1	16.1	14.0	14.0	14.0
Actuated g/C Ratio	0.11	0.28	0.28	0.15	0.31		0.20	0.20	0.20	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	982	439	259	1521		324	672	319	282	592	277
v/s Ratio Prot	0.08	c0.28		c0.12	0.21		0.16	c0.16		0.10	c0.10	
v/s Ratio Perm			0.13						0.04			0.02
v/c Ratio	0.73	1.00	0.48	0.79	0.67		0.77	0.78	0.21	0.59	0.59	0.11
Uniform Delay, d1	34.3	28.9	24.1	33.0	23.9		30.2	30.3	26.7	30.4	30.4	27.8
Progression Factor	0.66	0.62	1.04	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	27.4	3.5	15.1	2.3		10.8	6.0	0.3	3.3	1.6	0.2
Delay (s)	29.2	45.2	28.6	48.1	26.3		41.0	36.3	27.0	33.7	32.0	28.0
Level of Service	C	D	C	D	C		D	D	C	C	C	C
Approach Delay (s)		37.5			29.7			34.6			31.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay	33.9			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	73.1%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												










22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	150	774	324	115	510	152	316	511	102	292	529	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	815	341	121	537	160	333	538	107	307	557	242
RTOR Reduction (vph)	0	0	259	0	0	128	0	0	72	0	0	160
Lane Group Flow (vph)	158	815	82	121	537	32	333	538	35	307	557	82
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	10.1	21.2	21.2	6.5	17.6	17.6	16.5	28.8	28.8	15.5	27.8	27.8
Effective Green, g (s)	10.6	21.7	21.7	7.0	18.1	18.1	17.0	29.3	29.3	16.0	28.3	28.3
Actuated g/C Ratio	0.12	0.24	0.24	0.08	0.20	0.20	0.19	0.33	0.33	0.18	0.31	0.31
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	208	853	382	138	712	318	334	607	515	315	586	498
v/s Ratio Prot	c0.09	c0.23		0.07	0.15		c0.19	0.29		0.17	c0.30	
v/s Ratio Perm			0.05			0.02			0.02			0.05
v/c Ratio	0.76	0.96	0.22	0.88	0.75	0.10	1.00	0.89	0.07	0.97	0.95	0.16
Uniform Delay, d1	38.5	33.7	27.3	41.1	33.9	29.3	36.5	28.8	20.9	36.8	30.2	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	20.6	0.3	41.9	4.5	0.1	48.1	17.3	0.3	43.5	26.8	0.7
Delay (s)	53.2	54.2	27.6	83.0	38.4	29.5	84.6	46.1	21.2	80.3	56.9	23.0
Level of Service	D	D	C	F	D	C	F	D	C	F	E	C
Approach Delay (s)		47.2			43.2			56.5			56.0	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM Average Control Delay	50.9			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	90.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	86.4%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												








23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3516		1770	3539	1583	1770	1658		1770	1653	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3516		1770	3539	1583	1770	1658		1770	1653	
Volume (vph)	107	736	33	62	909	320	48	23	63	562	35	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	775	35	65	957	337	51	24	66	592	37	111
RTOR Reduction (vph)	0	3	0	0	0	100	0	61	0	0	93	0
Lane Group Flow (vph)	113	807	0	65	957	237	51	29	0	592	55	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.4	30.4		4.4	27.4	27.4	31.8	6.4		40.8	15.4	
Effective Green, g (s)	7.9	30.9		4.9	27.9	27.9	32.3	6.9		41.3	15.9	
Actuated g/C Ratio	0.08	0.31		0.05	0.28	0.28	0.32	0.07		0.41	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	1086		87	987	442	572	114		731	263	
v/s Ratio Prot	c0.06	0.23		0.04	c0.27		0.03	0.02		c0.33	c0.03	
v/s Ratio Perm						0.15						
v/c Ratio	0.81	0.74		0.75	0.97	0.54	0.09	0.25		0.81	0.21	
Uniform Delay, d1	45.3	31.0		46.9	35.6	30.6	23.6	44.1		25.9	36.6	
Progression Factor	1.00	1.00		0.89	0.77	0.62	1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.7	4.6		26.1	20.5	4.1	0.1	1.2		6.6	0.4	
Delay (s)	73.0	35.6		67.9	47.8	23.0	23.7	45.3		32.5	37.0	
Level of Service	E	D		E	D	C	C	D		C	D	
Approach Delay (s)		40.2			42.6			37.4			33.4	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay		39.5							D			
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		100.0				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		80.6%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						0.97	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539						3433	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1583	1770	3539						3433	1583
Volume (vph)	0	969	392	119	1023	0	0	0	0	0	626	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1020	413	125	1077	0	0	0	0	0	659	0
RTOR Reduction (vph)	0	0	75	0	0	0	0	0	0	0	76	0
Lane Group Flow (vph)	0	1020	338	125	1077	0	0	0	0	0	659	206
Turn Type			Perm	Prot							Prot	
Protected Phases		4		3	8						1	6
Permitted Phases			4									
Actuated Green, G (s)		47.2	47.2	9.8	61.5						29.5	29.5
Effective Green, g (s)		47.7	47.7	10.3	62.0						30.0	30.0
Actuated g/C Ratio		0.48	0.48	0.10	0.62						0.30	0.30
Clearance Time (s)		4.5	4.5	4.5	4.5						4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1688	755	182	2194						1030	475
v/s Ratio Prot		c0.29		c0.07	0.30						c0.19	0.13
v/s Ratio Perm			0.21									
v/c Ratio		0.60	0.45	0.69	0.49						0.64	0.43
Uniform Delay, d1		19.2	17.4	43.3	10.4						30.3	28.2
Progression Factor		0.43	0.38	1.05	0.56						1.00	1.00
Incremental Delay, d2		1.1	1.3	9.5	0.7						1.3	2.9
Delay (s)		9.3	7.9	55.2	6.6						31.6	31.0
Level of Service		A	A	E	A						C	C
Approach Delay (s)		8.9			11.6				0.0			31.5
Approach LOS		A			B				A			C
Intersection Summary												
HCM Average Control Delay			15.8							B		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			66.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												
























25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↗	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1594	0	0	700	442	255
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1678	0	0	737	465	268
RTOR Reduction (vph)	0	0	0	0	0	22
Lane Group Flow (vph)	1678	0	0	737	465	246
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	69.9			69.9	21.1	21.1
Effective Green, g (s)	70.4			70.4	21.6	21.6
Actuated g/C Ratio	0.70			0.70	0.22	0.22
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2491			2491	742	342
v/s Ratio Prot	c0.47			0.21	0.14	
v/s Ratio Perm						c0.16
v/c Ratio	0.67			0.30	0.63	0.72
Uniform Delay, d1	8.3			5.5	35.5	36.4
Progression Factor	0.37			1.00	1.00	1.00
Incremental Delay, d2	1.2			0.3	1.7	7.1
Delay (s)	4.3			5.8	37.2	43.5
Level of Service	A			A	D	D
Approach Delay (s)	4.3			5.8	39.5	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay	12.8			HCM Level of Service		B
HCM Volume to Capacity ratio	0.68					
Actuated Cycle Length (s)	100.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	66.5%			ICU Level of Service		C
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95			
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00			
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (prot)		1731			1823	1583	1770	3539	1583	1770	3534			
Flt Permitted		0.86			0.87	1.00	0.95	1.00	1.00	0.95	1.00			
Satd. Flow (perm)		1521			1614	1583	1770	3539	1583	1770	3534			
Volume (vph)	11	4	9	18	24	232	8	803	24	119	714	7		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	12	4	9	19	25	244	8	845	25	125	752	7		
RTOR Reduction (vph)	0	8	0	0	0	213	0	0	11	0	1	0		
Lane Group Flow (vph)	0	17	0	0	44	31	8	845	14	125	758	0		
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot				
Protected Phases		4			8		5	2		1	6			
Permitted Phases	4			8		8			2					
Actuated Green, G (s)		7.7			7.7	7.7	1.3	35.1	35.1	8.7	42.5			
Effective Green, g (s)		8.2			8.2	8.2	1.8	35.6	35.6	9.2	43.0			
Actuated g/C Ratio		0.13			0.13	0.13	0.03	0.55	0.55	0.14	0.66			
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		192			204	200	49	1938	867	251	2338			
v/s Ratio Prot							0.00	c0.24		c0.07	0.21			
v/s Ratio Perm		0.01			c0.03	0.02			0.01					
v/c Ratio		0.09			0.22	0.15	0.16	0.44	0.02	0.50	0.32			
Uniform Delay, d1		25.1			25.5	25.3	30.9	8.7	6.7	25.8	4.7			
Progression Factor		1.00			1.00	1.00	0.89	1.09	1.35	1.00	1.00			
Incremental Delay, d2		0.2			0.5	0.4	0.8	0.4	0.0	1.6	0.4			
Delay (s)		25.3			26.0	25.7	28.4	9.9	9.1	27.3	5.1			
Level of Service		C			C	C	C	A	A	C	A			
Approach Delay (s)		25.3			25.7			10.0			8.3			
Approach LOS		C			C			B			A			
Intersection Summary														
HCM Average Control Delay	11.6			HCM Level of Service						B				
HCM Volume to Capacity ratio	0.41													
Actuated Cycle Length (s)	65.0			Sum of lost time (s)						12.0				
Intersection Capacity Utilization	49.9%			ICU Level of Service						A				
Analysis Period (min)	15													
c Critical Lane Group														

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	142	4	7	271	2	2	0	2	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	149	4	7	285	2	2	0	2	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	287			154			455	456	152	457	457	286
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			154			455	456	152	457	457	286
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	100	100	100
cM capacity (veh/h)	1275			1427			512	498	895	510	497	753
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	155	295	4	2								
Volume Left	1	7	2	1								
Volume Right	4	2	2	0								
cSH	1275	1427	651	504								
Volume to Capacity	0.00	0.01	0.01	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.2	10.6	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.6	12.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization		29.1%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	129	2	4	285	8	1	10	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	136	2	4	300	8	1	11	0	3	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	308			138			455	458	137	459	455	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	308			138			455	458	137	459	455	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1252			1446			512	497	912	502	499	736
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	313	12	5								
Volume Left	2	4	1	3								
Volume Right	2	8	0	1								
cSH	1252	1446	498	536								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.4	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.4	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		27.7%		ICU Level of Service		A						
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	153	10	4	343	17	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	161	11	4	361	18	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		536	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		536	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	99
cM capacity (veh/h)			1405		504	878
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	365	27			
Volume Left	0	4	18			
Volume Right	11	0	9			
cSH	1700	1405	591			
Volume to Capacity	0.10	0.00	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.1	11.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		31.2%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	150	16	17	244	0	107	0	29	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	158	17	18	257	0	113	0	31	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	257			175			459	459	166	489	467	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			175			459	459	166	489	467	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			78	100	97	100	100	100
cM capacity (veh/h)	1308			1402			507	492	878	467	487	782
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	175	275	143	0								
Volume Left	0	18	113	0								
Volume Right	17	0	31	0								
cSH	1308	1402	558	1700								
Volume to Capacity	0.00	0.01	0.26	0.00								
Queue Length 95th (ft)	0	1	25	0								
Control Delay (s)	0.0	0.6	13.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.6	13.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization		40.3%			ICU Level of Service				A			
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	137	32	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	144	34	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			178		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1398		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	178	247	34			
Volume Left	0	0	34			
Volume Right	34	0	0			
cSH	1700	1398	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	177	161	15	993	225	555
v/c Ratio	0.12	0.88	0.55	0.18	0.89	0.87	0.39
Control Delay	27.9	92.5	35.6	55.6	24.3	79.4	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	92.5	35.6	55.6	24.3	79.4	5.7
Queue Length 50th (ft)	9	147	69	12	497	187	58
Queue Length 95th (ft)	40	#277	144	m17	#1048	#325	87
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	279	210	304	82	1112	272	1413
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.84	0.53	0.18	0.89	0.83	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	→	↖	←	↗	↘	↑	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	420	117	216	34	122	186	53
v/c Ratio	0.60	0.58	0.21	0.04	0.49	0.27	0.19
Control Delay	26.0	43.7	6.1	0.7	47.2	5.9	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	43.7	6.1	0.7	47.2	5.9	27.2
Queue Length 50th (ft)	188	53	33	0	73	8	19
Queue Length 95th (ft)	303	101	19	1	131	54	54
Internal Link Dist (ft)	1080		1080			421	1560
Turn Bay Length (ft)		150					
Base Capacity (vph)	699	248	1043	901	248	687	281
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.47	0.21	0.04	0.49	0.27	0.19

Intersection Summary

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	↗	→	↖	←	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	376	441	383	91	732	84
v/c Ratio	0.16	0.29	0.71	0.16	0.39	0.85	0.38
Control Delay	39.6	13.4	27.1	2.1	40.0	12.7	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	13.4	27.1	2.1	40.0	12.7	38.6
Queue Length 50th (ft)	10	54	253	6	55	0	49
Queue Length 95th (ft)	m27	132	m353	m24	81	97	75
Internal Link Dist (ft)		1080		1070	1920		2200
Turn Bay Length (ft)	150		150				
Base Capacity (vph)	129	1304	620	2464	524	1030	489
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.29	0.71	0.16	0.17	0.71	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	↗	→	↖	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	1079	344	776	545	144
v/c Ratio	0.23	0.88	0.93	0.40	0.96	0.48
Control Delay	45.7	32.0	72.7	13.7	56.2	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	32.0	72.7	13.7	56.2	27.9
Queue Length 50th (ft)	15	341	217	123	275	58
Queue Length 95th (ft)	m27	#439	#384	207	#491	119
Internal Link Dist (ft)		1070		550	687	2220
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	106	1233	372	1957	584	308
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.88	0.92	0.40	0.93	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	83	1093	164	247	853	557	194	42	368	582	130
v/c Ratio	0.43	0.84	0.26	0.96	0.55	0.55	0.79	0.09	0.82	1.02	0.40
Control Delay	43.5	34.0	9.0	81.4	23.3	6.3	60.8	32.7	25.2	80.8	20.2
Queue Delay	0.0	4.9	0.0	0.0	0.8	0.4	0.0	0.0	3.5	6.1	0.0
Total Delay	43.5	38.9	9.0	81.4	24.1	6.7	60.8	32.7	28.8	86.9	20.2
Queue Length 50th (ft)	45	304	19	142	206	29	107	11	45	~176	31
Queue Length 95th (ft)	86	#484	71	m#226	m258	m81	#212	24	141	#285	78
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	325	1302	624	256	1563	1010	256	649	521	572	404
Starvation Cap Reductn	0	0	0	0	384	135	0	0	0	0	0
Spillback Cap Reductn	0	153	0	0	0	0	0	0	83	11	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.95	0.26	0.96	0.72	0.64	0.76	0.06	0.84	1.04	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1343	698	89	847	446	1166
v/c Ratio	0.89	0.86	0.39	0.45	0.73	1.24dr
Control Delay	21.5	14.5	29.1	3.9	32.7	40.8
Queue Delay	28.4	9.2	0.0	0.1	0.0	0.7
Total Delay	49.9	23.7	29.1	4.1	32.7	41.5
Queue Length 50th (ft)	261	119	20	13	235	314
Queue Length 95th (ft)	m#404	m#157	m36	52	363	#468
Internal Link Dist (ft)		220		315		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1506	808	229	1887	608	1231
Starvation Cap Reductn	233	91	0	0	0	0
Spillback Cap Reductn	0	0	0	252	0	9
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.97	0.39	0.52	0.73	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.






Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.













11: Golf Course & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

					
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	189	1282	871	144	96
v/c Ratio	0.50	0.56	0.50	0.31	0.20
Control Delay	50.0	1.6	16.7	29.0	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	1.6	16.7	29.0	6.9
Queue Length 50th (ft)	49	18	163	66	0
Queue Length 95th (ft)	m56	m39	236	118	36
Internal Link Dist (ft)		270	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	610	2300	1740	462	484
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.56	0.50	0.31	0.20
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					

12: US-101 NB Ramps & Wilfred Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	205	391	448	69	118	433	586	295	214	862	345	583
v/c Ratio	0.67	0.78	0.69	0.46	0.26	0.61	0.87	0.40	0.43	0.88	0.63	0.37
Control Delay	51.2	43.4	15.3	34.0	15.6	5.4	50.1	34.0	7.9	37.9	17.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	43.4	15.3	34.0	15.6	5.4	50.1	34.0	7.9	37.9	17.9	0.3
Queue Length 50th (ft)	59	206	62	38	18	0	167	80	0	256	138	0
Queue Length 95th (ft)	#102	#345	174	m63	35	19	#253	120	59	m301	m170	m0
Internal Link Dist (ft)		284			243			214			74	
Turn Bay Length (ft)	250		100	115			275		75	35		75
Base Capacity (vph)	307	507	658	157	497	740	687	731	497	992	551	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.77	0.68	0.44	0.24	0.59	0.85	0.40	0.43	0.87	0.63	0.37
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	315	392	620	300	240	487
v/c Ratio	0.78	0.59	0.80	0.36	0.80	0.40
Control Delay	38.4	6.7	27.1	3.2	45.1	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	6.7	27.1	3.2	45.1	5.6
Queue Length 50th (ft)	115	0	213	0	103	138
Queue Length 95th (ft)	#221	60	#390	41 m#173	m55	
Internal Link Dist (ft)	480		3920		2550	
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	685	778	836	300	1208
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.57	0.80	0.36	0.80	0.40
Intersection Summary						
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m	Volume for 95th percentile queue is metered by upstream signal.					

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	↖	→	↘	↙	←	↗	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	61	567	47	128	615	432	73	78	69	383	377
v/c Ratio	0.46	0.64	0.11	0.50	0.69	0.60	0.10	0.21	0.18	0.79	0.77
Control Delay	47.1	31.5	8.8	36.5	18.7	6.1	25.9	12.0	8.5	40.4	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	31.5	8.8	36.5	18.7	6.1	25.9	12.0	8.5	40.4	36.4
Queue Length 50th (ft)	30	138	0	21	107	6	15	7	0	185	168
Queue Length 95th (ft)	67	193	26	m40	#153	7	31	43	33	#330	#308
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	885	431	257	885	720	730	380	374	483	492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.64	0.11	0.50	0.69	0.60	0.10	0.21	0.18	0.79	0.77
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.										
m	Volume for 95th percentile queue is metered by upstream signal.										

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	220	953	124	472	806	429	128	455	273	462	221	240
v/c Ratio	0.81	0.64	0.23	0.79	0.72	0.56	0.49	0.67	0.60	0.77	0.64	0.49
Control Delay	45.4	19.4	6.1	32.6	20.8	5.6	40.8	21.2	9.8	42.4	38.2	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	19.4	6.1	32.6	20.8	5.6	40.8	21.2	9.8	42.4	38.2	7.4
Queue Length 50th (ft)	77	110	0	128	208	59	58	60	0	111	103	0
Queue Length 95th (ft) m#183	158	m22	#180	217	60	#147	104	67	#202	158	53	
Internal Link Dist (ft)	320			520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	275	1490	551	601	1113	769	260	820	514	601	477	584
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.64	0.23	0.79	0.72	0.56	0.49	0.55	0.53	0.77	0.46	0.41

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1904	82	1361	246	24	364	364	340
v/c Ratio	0.79	0.56	0.66	0.16	0.05	0.87	0.87	0.64
Control Delay	6.8	54.6	7.1	0.2	9.8	47.6	47.6	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	54.6	7.1	0.2	9.8	47.6	47.6	26.1
Queue Length 50th (ft)	133	43	158	0	2	169	169	120
Queue Length 95th (ft)	79	m#82	164	m0	17	#320	#320	206
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2401	146	2058	1583	553	460	460	579
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.56	0.66	0.16	0.04	0.79	0.79	0.59

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	20	1427	531	1040	361	646	198	198	18
v/c Ratio	0.12	0.38	0.34	0.40	0.23	0.75	0.40	0.40	0.04
Control Delay	38.9	13.7	0.3	12.2	0.2	30.0	20.1	20.1	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	13.7	0.3	12.2	0.2	30.0	20.1	20.1	14.3
Queue Length 50th (ft)	10	134	0	79	0	145	69	69	5
Queue Length 95th (ft)	m12	m195	m0	124	m0	180	113	113	17
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	221	3733	1583	2606	1583	1082	617	617	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.38	0.34	0.40	0.23	0.60	0.32	0.32	0.03
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	283	980	576	205	1090	250	527	334	167	351	182
v/c Ratio	0.73	1.00	0.72	0.79	0.68	0.77	0.78	0.57	0.59	0.59	0.43
Control Delay	34.8	48.5	9.9	59.6	24.8	47.9	39.7	7.7	38.9	34.3	8.0
Queue Delay	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	48.5	10.5	59.6	24.8	47.9	39.7	7.7	38.9	34.3	8.0
Queue Length 50th (ft)	77	~280	8	102	159	129	137	0	84	88	0
Queue Length 95th (ft)	#113	#367	78	#240	214	#250	#200	65	148	129	50
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250			175	150	150
Base Capacity (vph)	386	981	803	259	1595	332	689	592	332	697	471
Starvation Cap Reductn	0	0	44	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	1.00	0.76	0.79	0.68	0.75	0.76	0.56	0.50	0.50	0.39
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	815	341	121	537	160	333	538	107	307	557	242
v/c Ratio	0.76	0.96	0.53	0.88	0.76	0.36	1.00	0.89	0.18	0.97	0.95	0.37
Control Delay	61.9	56.6	6.7	93.1	41.9	7.8	87.3	47.5	5.4	83.8	58.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	56.6	6.7	93.1	41.9	7.8	87.3	47.5	5.4	83.8	58.7	5.4
Queue Length 50th (ft)	88	241	0	70	153	0	191	288	0	176	308	3
Queue Length 95th (ft)	#182	#361	66	#171	#213	51	#363	#475	35	#338	#514	55
Internal Link Dist (ft)		689			6630			734			980	
Turn Bay Length (ft)	350		450	500		150	550		675	500		625
Base Capacity (vph)	215	853	640	138	710	446	334	607	588	315	586	658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.96	0.53	0.88	0.76	0.36	1.00	0.89	0.18	0.97	0.95	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	810	65	957	337	51	90	592	148
v/c Ratio	0.91	0.70	0.61	0.91	0.59	0.09	0.46	0.81	0.41
Control Delay	108.1	34.8	63.6	40.2	15.4	19.7	24.2	36.9	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	108.1	34.8	63.6	40.2	15.5	19.7	24.2	36.9	17.3
Queue Length 50th (ft)	73	250	43	334	105	19	15	320	23
Queue Length 95th (ft)	#179	324 m#105	#444	194	46	61	#553	80	
Internal Link Dist (ft)		6630		350		200		236	
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	124	1151	106	1049	567	595	329	732	768
Starvation Cap Reductn	0	0	0	0	9	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.70	0.61	0.91	0.60	0.09	0.27	0.81	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1020	413	125	1077	659	282
v/c Ratio	0.59	0.49	0.61	0.49	0.64	0.51
Control Delay	9.7	6.1	55.2	6.7	33.7	21.1
Queue Delay	0.2	0.3	0.0	0.4	0.0	0.0
Total Delay	9.9	6.4	55.2	7.1	33.7	21.1
Queue Length 50th (ft)	154	78	70	93	187	88
Queue Length 95th (ft)	199	m103	m110	110	247	169
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1721	843	283	2194	1030	551
Starvation Cap Reductn	186	99	0	576	0	0
Spillback Cap Reductn	81	0	0	121	0	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.56	0.44	0.67	0.64	0.51
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1678	737	465	268
v/c Ratio	0.67	0.30	0.63	0.73
Control Delay	4.8	6.6	38.6	44.0
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	4.9	6.6	38.6	44.0
Queue Length 50th (ft)	31	78	140	145
Queue Length 95th (ft)	280	142	170	210
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2490	2490	1030	495
Starvation Cap Reductn	184	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.30	0.45	0.54
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative A (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	44	244	8	845	25	125	759
v/c Ratio	0.12	0.21	0.59	0.05	0.43	0.03	0.44	0.30
Control Delay	19.5	26.5	10.2	23.8	11.1	5.3	28.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	26.5	10.2	23.8	11.1	5.3	28.9	4.9
Queue Length 50th (ft)	6	16	0	4	121	2	46	33
Queue Length 95th (ft)	23	39	53	m5	m198	m3	84	127
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	452	469	615	191	1986	899	324	2535
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.09	0.40	0.04	0.43	0.03	0.39	0.30
Intersection Summary								
m	Volume for 95th percentile queue is metered by upstream signal.							

**NEAR-TERM 2008 + ALTERNATIVE B
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕	↕	↕	↕		↕	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.91	1.00	1.00	0.85	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1699	1770	1863	1583	1770	1844	1770	1844	1770	1861	1861	1861
Flt Permitted	1.00	0.74	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1699	1383	1863	1583	1770	1844	1770	1844	1770	1861	1861	1861
Volume (vph)	0	8	14	106	13	97	12	844	62	196	514	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	15	112	14	102	13	888	65	206	541	3
RTOR Reduction (vph)	0	13	0	0	0	89	0	2	0	0	0	0
Lane Group Flow (vph)	0	10	0	112	14	13	951	0	206	544	0	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		10.2		10.2	10.2	10.2	1.0	51.2		10.6	60.8	
Effective Green, g (s)		10.7		10.7	10.7	10.7	1.5	51.7		11.1	61.3	
Actuated g/C Ratio		0.13		0.13	0.13	0.13	0.02	0.60		0.13	0.72	
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		213		173	233	198	31	1115		230	1334	
v/s Ratio Prot		0.01			0.01		0.01	c0.52		c0.12	0.29	
v/s Ratio Perm				c0.08		0.01						
v/c Ratio		0.05		0.65	0.06	0.06	0.42	0.85		0.90	0.41	
Uniform Delay, d1		32.9		35.6	33.0	33.0	41.6	13.8		36.6	4.8	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		8.1	0.1	0.1	8.9	6.5		32.6	0.2	
Delay (s)		33.0		43.7	33.1	33.1	50.5	20.3		69.3	5.0	
Level of Service		C		D	C	C	D	C		E	A	
Approach Delay (s)		33.0			38.3			20.7			22.7	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		23.6										
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		85.5										
Intersection Capacity Utilization		81.6%										
Analysis Period (min)		15										
c Critical Lane Group												



















2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕			↕	↕		↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.93		1.00	0.99			1.00	0.85		0.95	0.95
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	0.98
Satd. Flow (prot)	1770	1723		1770	1849			1840	1583		1750	1750
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00		0.92	0.92
Satd. Flow (perm)	1770	1723		1770	1849			1753	1583		1636	1636
Volume (vph)	10	131	131	495	201	10	10	32	700	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	138	138	521	212	11	11	34	737	11	11	11
RTOR Reduction (vph)	0	45	0	0	2	0	0	0	589	0	9	0
Lane Group Flow (vph)	11	231	0	521	221	0	0	45	148	0	24	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2			
Actuated Green, G (s)	0.8	12.2		21.2	32.6			11.2	11.2		11.2	
Effective Green, g (s)	1.3	12.7		21.7	33.1			11.7	11.7		11.7	
Actuated g/C Ratio	0.02	0.22		0.37	0.57			0.20	0.20		0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	40	377		661	1053			353	319		329	
v/s Ratio Prot	0.01	c0.13		c0.29	0.12							
v/s Ratio Perm								0.03	c0.09		0.01	
v/c Ratio	0.28	0.61		0.79	0.21			0.13	0.47		0.07	
Uniform Delay, d1	27.9	20.5		16.2	6.1			19.0	20.4		18.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.7	3.0		6.2	0.1			0.2	1.1		0.1	
Delay (s)	31.6	23.4		22.4	6.2			19.2	21.5		18.9	
Level of Service	C	C		C	A			B	C		B	
Approach Delay (s)		23.8			17.5			21.4			18.9	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM Average Control Delay		20.2										
HCM Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		58.1										
Intersection Capacity Utilization		71.6%										
Analysis Period (min)		15										
c Critical Lane Group												



















3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop		Stop		
Grade	0%			0%				0%		0%		
Volume (veh/h)	10	821	10	10	685	20	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	864	11	11	721	21	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	742			875			1648	1654	869	1654	1648	732
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	742			875			1648	1654	869	1654	1648	732
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			85	89	97	85	89	98
cM capacity (veh/h)	865			772			69	96	351	68	96	421
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	875	11	742	32	32						
Volume Left	11	0	11	0	11	11						
Volume Right	0	11	0	21	11	11						
cSH	865	1700	772	1700	108	110						
Volume to Capacity	0.01	0.51	0.01	0.44	0.29	0.29						
Queue Length 95th (ft)	1	0	1	0	28	27						
Control Delay (s)	9.2	0.0	9.7	0.0	51.4	50.7						
Lane LOS	A		A		F	F						
Approach Delay (s)	0.1		0.1		51.4	50.7						
Approach LOS					F	F						
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			53.8%		ICU Level of Service				A			
Analysis Period (min)			15									













4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	10	820	10	10	685	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	863	11	11	721	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)	1160											
pX, platoon unblocked	0.67						0.67	0.67		0.67	0.67	0.67
vC, conflicting volume	732			874			1647	1642	868	1647	1642	726
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	602			874			1959	1951	868	1959	1951	594
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			57	75	97	57	75	97
cM capacity (veh/h)	658			772			25	42	352	25	42	341
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	874	11	732	32	32						
Volume Left	11	0	11	0	11	11						
Volume Right	0	11	0	11	11	11						
cSH	658	1700	772	1700	45	45						
Volume to Capacity	0.02	0.51	0.01	0.43	0.71	0.71						
Queue Length 95th (ft)	1	0	1	0	68	68						
Control Delay (s)	10.6	0.0	9.7	0.0	193.1	193.4						
Lane LOS	B		A		F	F						
Approach Delay (s)	0.1		0.1		193.1	193.4						
Approach LOS					F	F						
Intersection Summary												
Average Delay				7.4								
Intersection Capacity Utilization				53.8%	ICU Level of Service			A				
Analysis Period (min)				15								













5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.88			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	
Satd. Flow (prot)	1770	1835		1770	1826			1635			1771	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.37	
Satd. Flow (perm)	1770	1835		1770	1826			1571			672	
Volume (vph)	60	703	77	116	644	99	35	6	266	112	21	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	740	81	122	678	104	37	6	280	118	22	15
RTOR Reduction (vph)	0	5	0	0	7	0	0	215	0	0	5	0
Lane Group Flow (vph)	63	816	0	122	775	0	0	108	0	0	150	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	4.4	42.5		5.8	43.9			18.2			18.2	
Effective Green, g (s)	4.9	43.0		6.3	44.4			18.7			18.7	
Actuated g/C Ratio	0.06	0.54		0.08	0.55			0.23			0.23	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	108	986		139	1013			367			157	
v/s Ratio Prot	0.04	c0.44		c0.07	0.42							
v/s Ratio Perm								0.07			c0.22	
v/c Ratio	0.58	0.83		0.88	0.77			0.30			0.96	
Uniform Delay, d1	36.6	15.4		36.5	13.8			25.2			30.3	
Progression Factor	1.00	1.00		1.19	0.56			1.00			1.00	
Incremental Delay, d2	7.8	7.9		32.3	3.9			0.5			58.6	
Delay (s)	44.4	23.4		75.5	11.7			25.7			88.9	
Level of Service	D	C		E	B			C			F	
Approach Delay (s)		24.9			20.3			25.7			88.9	
Approach LOS		C			C			C			F	
Intersection Summary												
HCM Average Control Delay		27.5			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		88.3%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			1.00			0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1770	1822		1770	1832			1805			1583	
Flt Permitted	0.95	1.00		0.95	1.00			0.72			1.00	
Satd. Flow (perm)	1770	1822		1770	1832			1341			1583	
Volume (vph)	52	881	148	187	732	89	80	45	222	88	13	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	927	156	197	771	94	84	47	234	93	14	49
RTOR Reduction (vph)	0	7	0	0	5	0	0	0	187	0	22	0
Lane Group Flow (vph)	55	1076	0	197	860	0	0	131	47	0	134	0
Turn Type	Prot			Prot			Perm			Perm	Perm	
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			2	6	
Actuated Green, G (s)	3.9	42.5		11.3	49.9			12.7			12.7	
Effective Green, g (s)	4.4	43.0		11.8	50.4			13.2			13.2	
Actuated g/C Ratio	0.06	0.54		0.15	0.63			0.16			0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	97	979		261	1154			221	261		198	
v/s Ratio Prot	0.03	c0.59		c0.11	0.47							
v/s Ratio Perm								0.10	0.03		c0.11	
v/c Ratio	0.57	1.10		0.75	0.75			0.59	0.18		0.68	
Uniform Delay, d1	36.9	18.5		32.7	10.3			30.9	28.7		31.4	
Progression Factor	0.83	1.50		0.95	1.45			1.00	1.00		1.00	
Incremental Delay, d2	4.6	54.6		7.0	2.6			4.2	0.3		8.9	
Delay (s)	35.4	82.3		38.1	17.5			35.1	29.1		40.3	
Level of Service	D	F		D	B			D	C		D	
Approach Delay (s)		80.0			21.3			31.2			40.3	
Approach LOS		F			C			C			D	
Intersection Summary												
HCM Average Control Delay		48.3			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		90.8%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3458		1770	1863	1583	1770	3539	1583	3433	1734	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3458		1770	1863	1583	1770	3539	1583	3433	1734	
Volume (vph)	105	919	166	181	692	540	204	155	265	451	131	112
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	967	175	191	728	568	215	163	279	475	138	118
RTOR Reduction (vph)	0	6	0	0	0	131	0	0	256	0	19	0
Lane Group Flow (vph)	111	1136	0	191	728	437	215	163	23	475	237	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8				2			
Actuated Green, G (s)	13.7	80.2		20.8	87.3	87.3	19.5	12.7	12.7	28.3	21.5	
Effective Green, g (s)	14.2	80.7		21.3	87.8	87.8	20.0	13.2	13.2	28.8	22.0	
Actuated g/C Ratio	0.09	0.50		0.13	0.55	0.55	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	157	1744		236	1022	869	221	292	131	618	238	
v/s Ratio Prot	0.06	0.33		c0.11	c0.39		c0.12	0.05		0.14	c0.14	
v/s Ratio Perm					0.28			0.01				
v/c Ratio	0.71	0.65		0.81	0.71	0.50	0.97	0.56	0.18	0.77	1.00	
Uniform Delay, d1	70.9	29.3		67.4	26.7	22.5	69.7	70.6	68.3	62.4	69.0	
Progression Factor	1.09	1.30		0.89	0.85	1.00	1.00	1.00	1.00	0.96	0.96	
Incremental Delay, d2	4.4	0.6		14.3	3.2	1.6	52.5	2.3	0.6	5.7	56.7	
Delay (s)	82.0	38.5		74.3	26.0	24.0	122.2	72.9	69.0	65.7	122.9	
Level of Service	F	D		E	C	C	F	E	E	E	F	
Approach Delay (s)		42.4			31.4			87.4			85.7	
Approach LOS		D			C			F			F	
Intersection Summary												
HCM Average Control Delay		53.3			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		80.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528	
Volume (vph)	5	30	140	5	95	95	164	161	5	30	212	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	169	5	32	223	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	2	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	169	3	32	226	0
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot		
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases				4						2		
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.8	48.9	48.9	3.3	39.4	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		13.3	49.4	49.4	3.8	39.9	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.17	0.62	0.62	0.05	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		294	2185	978	84	1760	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm				0.01				0.00				
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.59	0.08	0.00	0.38	0.13	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.8	6.1	5.9	37.0	10.7	
Progression Factor	1.00	1.00	1.00	0.83	1.33		1.10	0.71	0.63	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.1	0.4		2.5	0.1	0.0	2.9	0.2	
Delay (s)	39.7	32.4	32.1	32.8	43.7		36.4	4.4	3.7	39.8	10.9	
Level of Service	D	C	C	C	D		D	A	A	D	B	
Approach Delay (s)		32.3			43.4			20.3			14.5	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM Average Control Delay		25.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.25										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		30.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												





























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↓	↓↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3046	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3046	
Volume (vph)	0	941	694	89	731	0	0	0	0	328	324	677
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	991	731	94	769	0	0	0	0	345	341	713
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	128	0
Lane Group Flow (vph)	0	991	588	94	769	0	0	0	0	345	926	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8				6		
Permitted Phases		4						6				
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	990	
v/s Ratio Prot		0.28		0.03		c0.22						
v/s Ratio Perm		c0.37								0.21	0.30	
v/c Ratio		0.60	0.80	0.45	0.38					0.66	1.16dr	
Uniform Delay, d1		16.0	18.3	36.2	9.2					23.2	26.2	
Progression Factor		1.39	2.00	1.16	1.45					1.00	1.00	
Incremental Delay, d2		1.2	6.5	1.2	0.4					6.4	16.8	
Delay (s)		23.3	43.2	43.1	13.8					29.6	43.0	
Level of Service		C	D	D	B					C	D	
Approach Delay (s)		31.8		17.0		0.0		39.7				
Approach LOS		C		B		A		D				
Intersection Summary												
HCM Average Control Delay		31.3		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		83.2%		ICU Level of Service		E						
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Flt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3408		1681	1715	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3408		1681	1715	2787	1770	1814	
Volume (vph)	0	569	701	413	356	117	465	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	599	738	435	375	123	489	114	599	44	43	9
RTOR Reduction (vph)	0	0	274	0	33	0	0	0	475	0	7	0
Lane Group Flow (vph)	0	599	464	435	465	0	294	309	124	44	45	0
Turn Type	Prot	pm+ov		Prot			Split	Perm		Split		
Protected Phases	7	4	2	3	8	2		2	6		6	
Permitted Phases	4			2								
Actuated Green, G (s)	17.5	33.5	12.5	34.5	16.0		16.0	16.0	16.0	16.0		
Effective Green, g (s)	18.0	34.5	13.0	35.0	16.5		16.5	16.5	16.5	16.5		
Actuated g/C Ratio	0.22	0.43	0.16	0.44	0.21		0.21	0.21	0.21	0.21		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1144	683	558	1491	347		354	575	365	374		
v/s Ratio Prot	0.12	c0.14	c0.13	0.14	0.17		c0.18	c0.02		0.02		
v/s Ratio Perm	0.15			0.04								
v/c Ratio	0.52	0.68	0.78	0.31	0.85		0.87	0.21	0.12	0.12		
Uniform Delay, d1	27.2	18.3	32.1	14.7	30.5		30.7	26.4	25.8	25.8		
Progression Factor	1.50	4.75	1.18	1.22	0.90		0.90	1.48	0.86	0.84		
Incremental Delay, d2	1.4	4.3	6.3	0.5	20.9		23.4	0.8	0.7	0.7		
Delay (s)	42.3	91.2	44.1	18.4	48.4		51.0	39.8	22.9	22.4		
Level of Service	D	F	D	B	D		D	D	C	C		
Approach Delay (s)	69.3	30.4			44.8		22.6					
Approach LOS	E	C			D		C					
Intersection Summary												
HCM Average Control Delay	49.6			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.61											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	68.5%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	981	649	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1033	683	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1033	714	0	97	65
Turn Type	Prot				Perm	
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.9	50.5	36.1		20.5	20.5
Effective Green, g (s)	10.4	51.0	36.6		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	446	2256	1607		465	416
v/s Ratio Prot	0.06	c0.29	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.46	0.46	0.44		0.21	0.16
Uniform Delay, d1	32.2	7.4	14.8		23.0	22.7
Progression Factor	0.91	2.18	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	0.9		1.0	0.8
Delay (s)	30.0	16.7	15.7		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)	18.9	15.7			23.6	
Approach LOS	B	B			C	
Intersection Summary						
HCM Average Control Delay		18.6		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.39				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		40.3%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						












12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00		1.00	0.95		1.00	0.95
Frt	1.00	1.00	0.85		0.96	1.00		1.00	1.00		1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98	0.95		1.00	1.00		0.95	1.00
Satd. Flow (prot)	1681	1686	1583		1741	1770		3537	3537		1770	3539
Flt Permitted	0.95	0.95	1.00		0.98	0.95		1.00	1.00		0.95	1.00
Satd. Flow (perm)	1681	1686	1583		1741	1770		3537	3537		1770	3539
Volume (vph)	495	3	40	8	3	5	514	489	2	7	435	706
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	521	3	42	8	3	5	541	515	2	7	458	743
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	210
Lane Group Flow (vph)	261	263	11	0	11	0	541	516	0	7	458	533
Turn Type	Split		Perm	Split			Prot			Prot		pm+ov
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases			4									6
Actuated Green, G (s)	20.2	20.2	20.2		1.5		27.1	38.8		1.5	13.2	33.4
Effective Green, g (s)	20.7	20.7	20.7		2.0		27.6	39.3		2.0	13.7	34.4
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.43
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	435	436	410		44		611	1738		44	606	681
v/s Ratio Prot	0.16	0.16			c0.01		c0.31	0.15		0.00	0.13	c0.20
v/s Ratio Perm			0.01									0.13
v/c Ratio	0.60	0.60	0.03		0.25		0.89	0.30		0.16	0.76	0.78
Uniform Delay, d1	26.0	26.0	22.1		38.3		24.7	12.1		38.2	31.6	19.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.29	1.04	1.10
Incremental Delay, d2	2.2	2.4	0.0		3.0		14.4	0.4		1.1	5.6	3.8
Delay (s)	28.2	28.4	22.2		41.3		39.1	12.6		50.2	38.4	25.3
Level of Service	C	C	C		D		D	B		D	D	C
Approach Delay (s)	27.9				41.3		26.1				30.5	
Approach LOS	C				D		C				C	
Intersection Summary												
HCM Average Control Delay		28.4		HCM Level of Service	C							
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	16.0							
Intersection Capacity Utilization		85.5%		ICU Level of Service	E							
Analysis Period (min)		15										
c Critical Lane Group												












13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583	1863	1583		1863
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1770	1583	1863	1583		1863
Volume (vph)	278	86	832	606	0	634
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	293	91	876	638	0	667
RTOR Reduction (vph)	0	68	0	256	0	0
Lane Group Flow (vph)	293	23	876	382	0	667
Turn Type	Perm		Perm			
Protected Phases	8		2		6	
Permitted Phases	8		2			
Actuated Green, G (s)	13.0	13.0	31.6	31.6	31.6	
Effective Green, g (s)	13.5	13.5	32.1	32.1	32.1	
Actuated g/C Ratio	0.25	0.25	0.60	0.60	0.60	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	446	399	1116	948	1116	
v/s Ratio Prot	c0.17		c0.47		0.36	
v/s Ratio Perm	0.01		0.24			
v/c Ratio	0.66	0.06	0.78	0.40	0.60	
Uniform Delay, d1	18.0	15.2	8.1	5.7	6.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.1	3.7	0.3	0.9	
Delay (s)	21.5	15.3	11.8	6.0	7.6	
Level of Service	C	B	B	A	A	
Approach Delay (s)	20.0		9.4		7.6	
Approach LOS	B		A		A	
Intersection Summary						
HCM Average Control Delay	10.5		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.75					
Actuated Cycle Length (s)	53.6		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	65.9%		ICU Level of Service		C	
Analysis Period (min)	15					
c Critical Lane Group						













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization	37.7%			ICU Level of Service		A
Analysis Period (min)	15					

























16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	649	789	251	223	688
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	683	831	264	235	724
RTOR Reduction (vph)	0	259	0	154	0	0
Lane Group Flow (vph)	271	424	831	110	235	724
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	15.5	15.5	26.5	26.5	9.5	40.5
Effective Green, g (s)	16.0	16.0	27.0	27.0	10.0	41.0
Actuated g/C Ratio	0.25	0.25	0.42	0.42	0.15	0.63
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	390	774	658	272	1175
v/s Ratio Prot	0.15		c0.45		c0.13	0.39
v/s Ratio Perm		c0.27		0.07		
v/c Ratio	0.62	1.09	1.07	0.17	0.86	0.62
Uniform Delay, d1	21.8	24.5	19.0	11.9	26.8	7.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	70.7	54.0	0.5	23.6	2.4
Delay (s)	24.6	95.2	73.0	12.5	50.4	9.7
Level of Service	C	F	E	B	D	A
Approach Delay (s)	75.2		58.4		19.7	
Approach LOS	E		E		B	
Intersection Summary						
HCM Average Control Delay	51.4		HCM Level of Service		D	
HCM Volume to Capacity ratio	1.04					
Actuated Cycle Length (s)	65.0		Sum of lost time (s)		12.0	
Intersection Capacity Utilization	88.4%		ICU Level of Service		E	
Analysis Period (min)	15					
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	611	36	202	938	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	643	38	213	987	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	27	0	0	108	0	59	66	0	66	0
Lane Group Flow (vph)	53	643	11	213	987	54	67	38	19	284	83	0
Turn Type	Prot		Perm		Prot		Perm		Prot		Perm	
Protected Phases	7		4		3		8		5		2	
Permitted Phases			4				8				2	
Actuated Green, G (s)	3.3	22.2	22.2	6.5	25.4	25.4	4.6	17.8	17.8	15.5	28.7	
Effective Green, g (s)	3.8	22.7	22.7	7.0	25.9	25.9	5.1	18.3	18.3	16.0	29.2	
Actuated g/C Ratio	0.05	0.28	0.28	0.09	0.32	0.32	0.06	0.23	0.23	0.20	0.36	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	1004	449	300	1146	512	219	357	344	354	609	
v/s Ratio Prot	0.03	c0.18		0.06	c0.28		c0.02	0.02		c0.16	c0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.64	0.02	0.71	0.86	0.11	0.31	0.11	0.06	0.80	0.14	
Uniform Delay, d1	37.4	25.1	20.7	35.5	25.4	18.9	35.8	24.4	24.1	30.5	17.0	
Progression Factor	1.00	1.00	1.00	1.33	0.42	0.15	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	1.4	0.0	4.0	3.7	0.0	0.8	0.6	0.3	12.3	0.5	
Delay (s)	51.8	26.5	20.7	51.2	14.4	2.9	36.6	25.0	24.4	42.8	17.4	
Level of Service	D	C	C	D	B	A	D	C	C	D	B	
Approach Delay (s)	28.0		18.8		27.9		34.1					
Approach LOS	C		B		C		C					
Intersection Summary												
HCM Average Control Delay	24.4		HCM Level of Service		C							
HCM Volume to Capacity ratio	0.66											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		16.0							
Intersection Capacity Utilization	61.7%		ICU Level of Service		B							
Analysis Period (min)	15											
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	712	146	371	1019	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	749	154	391	1073	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	214	0	117	227	0	0	206
Lane Group Flow (vph)	245	749	51	391	1073	163	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.4	26.0	26.0	11.5	25.1	25.1	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.9	26.5	26.5	12.0	25.6	25.6	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	285	1684	524	515	1132	507	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.15		0.11	c0.30		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.10			0.03			0.03
v/c Ratio	0.86	0.44	0.10	0.76	0.95	0.32	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.7	21.0	18.5	32.6	26.5	20.6	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.59	0.67	0.68	0.72	0.67	0.39	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.8	0.7	0.3	4.4	12.8	1.2	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	37.2	14.6	12.8	28.0	30.6	9.1	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	B	C	C	A	D	C	C	D	D	C
Approach Delay (s)		19.2			25.6			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		27.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												






















19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0				4.0		4.0
Lane Util. Factor		0.91		1.00		0.95				1.00		0.95
Frt		0.97		1.00		0.85				0.90		1.00
Flt Protected		1.00		0.95		1.00				0.99		0.95
Satd. Flow (prot)		4943		1770		3539				1658		1686
Flt Permitted		1.00		0.95		1.00				0.91		0.74
Satd. Flow (perm)		4943		1770		3539				1529		1254
Volume (vph)	0	1219		278		68				7		1
Peak-hour factor, PHF	0.95	0.95		0.95		0.95				0.95		0.95
Adj. Flow (vph)	0	1283		293		72				7		1
RTOR Reduction (vph)	0	44		0		0				0		0
Lane Group Flow (vph)	0	1532		0		72				0		370
Turn Type		Prot		Free		Perm				Perm		Perm
Protected Phases		4		3		8				2		6
Permitted Phases						Free				2		6
Actuated Green, G (s)		35.4		4.8		44.7				26.3		26.3
Effective Green, g (s)		35.9		5.3		45.2				26.8		26.8
Actuated g/C Ratio		0.45		0.07		0.57				0.34		0.34
Clearance Time (s)		4.5		4.5		4.5				4.5		4.5
Vehicle Extension (s)		3.0		3.0		3.0				3.0		3.0
Lane Grp Cap (vph)		2218		117		2000				512		439
v/s Ratio Prot		0.31		0.04		c0.41						
v/s Ratio Perm						0.13				0.01		0.28
v/c Ratio		0.69		0.62		0.73				0.03		0.84
Uniform Delay, d1		17.6		36.4		12.9				17.8		24.6
Progression Factor		0.45		1.02		1.37				1.00		1.00
Incremental Delay, d2		1.5		7.9		2.0				0.0		13.7
Delay (s)		9.5		44.9		19.7				17.9		38.4
Level of Service		A		D		B				B		D
Approach Delay (s)		9.5				18.4				17.9		36.1
Approach LOS		A				B				B		D
Intersection Summary												
HCM Average Control Delay		19.6				HCM Level of Service				B		
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		80.0				Sum of lost time (s)				8.0		
Intersection Capacity Utilization		73.4%				ICU Level of Service				D		
Analysis Period (min)		15										
c Critical Lane Group												




















20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.82	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1492	
Volume (vph)	17	1642	273	0	997	350	654	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1728	287	0	1049	368	688	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1728	287	0	1049	368	688	160	160	0	16	0
Turn Type	Prot		Free			Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases			Free			Free	2		2	6		
Actuated Green, G (s)	2.2	45.6	80.0		38.9	80.0	25.4	25.4	25.4		25.4	
Effective Green, g (s)	2.7	46.1	80.0		39.4	80.0	25.9	25.9	25.9		25.9	
Actuated g/C Ratio	0.03	0.58	1.00		0.49	1.00	0.32	0.32	0.32		0.32	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3693	1583		2504	1583	873	487	487		483	
v/s Ratio Prot	0.01	c0.27			0.21			0.11				
v/s Ratio Perm			0.18			0.23	c0.26		0.11		0.01	
v/c Ratio	0.30	0.47	0.18		0.42	0.23	0.79	0.33	0.33		0.03	
Uniform Delay, d1	37.7	9.8	0.0		13.0	0.0	24.6	20.5	20.5		18.5	
Progression Factor	1.07	1.11	1.00		1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.8	0.3	0.2		0.5	0.3	4.8	0.4	0.4		0.0	
Delay (s)	42.4	11.2	0.2		13.5	0.3	29.3	20.9	20.9		18.5	
Level of Service	D	B	A		B	A	C	C	C		B	
Approach Delay (s)		9.9			10.1			26.6			18.5	
Approach LOS		A			B			C			B	
Intersection Summary												
HCM Average Control Delay	13.8			HCM Level of Service				B				
HCM Volume to Capacity ratio	0.58											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				8.0				
Intersection Capacity Utilization	51.4%			ICU Level of Service				A				
Analysis Period (min)	15											
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1149	545	141	783	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1209	574	148	824	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	332	0	37	0	0	0	192	0	0	165
Lane Group Flow (vph)	284	1209	242	148	966	0	226	475	44	107	242	28
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.5	32.6	32.6	7.5	28.6		15.2	15.2	15.2	11.7	11.7	11.7
Effective Green, g (s)	12.0	33.1	33.1	8.0	29.1		15.7	15.7	15.7	12.2	12.2	12.2
Actuated g/C Ratio	0.14	0.39	0.39	0.09	0.34		0.18	0.18	0.18	0.14	0.14	0.14
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	485	1378	616	167	1694		297	615	292	231	487	227
v/s Ratio Prot	0.08	c0.34		c0.08	0.20		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.15						0.03			0.02
v/c Ratio	0.59	0.88	0.39	0.89	0.57		0.76	0.77	0.15	0.46	0.50	0.12
Uniform Delay, d1	34.2	24.1	18.7	38.1	22.8		32.9	33.0	29.1	33.4	33.6	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	8.1	1.9	38.7	1.4		10.9	6.0	0.2	1.5	0.8	0.2
Delay (s)	36.0	32.2	20.6	76.7	24.2		43.8	38.9	29.3	34.9	34.4	32.0
Level of Service	D	C	C	E	C		D	D	C	C	C	C
Approach Delay (s)		29.5			31.0			37.7			33.6	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay	32.0			HCM Level of Service				C				
HCM Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	85.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	71.9%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	346	321	494	108	363	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	364	338	520	114	382	360	231
RTOR Reduction (vph)	0	0	170	0	0	290	0	0	80	0	0	166
Lane Group Flow (vph)	140	509	43	135	620	74	338	520	34	382	360	65
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	6.5	15.7	15.7	6.5	15.7	15.7	17.5	23.0	23.0	16.5	22.0	22.0
Effective Green, g (s)	7.0	16.2	16.2	7.0	16.2	16.2	18.0	23.5	23.5	17.0	22.5	22.5
Actuated g/C Ratio	0.09	0.20	0.20	0.09	0.20	0.20	0.23	0.29	0.29	0.21	0.28	0.28
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	719	322	155	719	322	400	549	467	378	526	447
v/s Ratio Prot	c0.08	0.14		0.08	c0.18		0.19	c0.28		c0.22	0.19	
v/s Ratio Perm			0.03			0.05			0.02			0.04
v/c Ratio	0.90	0.71	0.13	0.87	0.86	0.23	0.84	0.95	0.07	1.01	0.68	0.15
Uniform Delay, d1	36.0	29.5	26.0	35.9	30.7	26.5	29.5	27.5	20.2	31.4	25.4	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.9	3.2	0.2	37.7	10.4	0.4	15.0	27.3	0.3	49.0	7.1	0.7
Delay (s)	80.9	32.7	26.2	73.6	41.1	26.9	44.5	54.8	20.5	80.3	32.5	22.1
Level of Service	F	C	C	E	D	C	D	D	C	F	C	C
Approach Delay (s)		38.9			40.4			47.2			48.8	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay		43.9			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		79.7			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		83.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3521		1770	3539	1583	1770	1660	1770	1660	1770	1649
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	3521		1770	3539	1583	1770	1660	1770	1660	1770	1649
Volume (vph)	102	892	32	53	981	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	939	34	56	1033	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	0	104	0	61	0	0	60	0
Lane Group Flow (vph)	107	970	0	56	1033	247	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1127		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.28		0.03	c0.29		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm						0.16						
v/c Ratio	0.67	0.86		0.58	1.03	0.55	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	28.7		41.6	32.2	27.3	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.64	0.52	0.26	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	8.7		7.5	32.9	4.0	22.4	1.0		5.7	0.1	
Delay (s)	50.4	37.4		33.9	49.6	11.2	64.9	40.2		30.6	16.7	
Level of Service	D	D		C	D	B	E	D		C	B	
Approach Delay (s)		38.7			39.6			49.1			27.8	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM Average Control Delay		37.4			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		78.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↓	↑↑					↓	↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	628	99	1143	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	661	104	1203	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	0	0	49	0
Lane Group Flow (vph)	0	862	495	104	1203	0	0	0	0	673	174	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		0.24		0.06		c0.34				c0.20	0.11	
v/s Ratio Perm		c0.31										
v/c Ratio		0.59	0.76	0.44	0.58					0.61	0.34	
Uniform Delay, d1		20.7	22.8	35.8	11.5					25.7	23.2	
Progression Factor		0.46	0.50	1.41	2.06					1.00	1.00	
Incremental Delay, d2		1.1	5.2	1.1	1.0					1.0	1.8	
Delay (s)		10.7	16.6	51.7	24.8					26.7	25.0	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		13.2		26.9		0.0				26.3		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		21.2		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		72.6%		ICU Level of Service		C						
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	594	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	625	248
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	1538	0	0	649	625	229
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	59.0			59.0	22.0	22.0
Effective Green, g (s)	59.5			59.5	22.5	22.5
Actuated g/C Ratio	0.66			0.66	0.25	0.25
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2340			2340	858	396
v/s Ratio Prot	c0.43			0.18	c0.18	
v/s Ratio Perm				0.14		
v/c Ratio	0.66			0.28	0.73	0.58
Uniform Delay, d1	9.1			6.3	30.9	29.6
Progression Factor	0.61			1.00	1.00	1.00
Incremental Delay, d2	1.2			0.3	3.1	2.0
Delay (s)	6.8			6.6	34.1	31.6
Level of Service	A			A	C	C
Approach Delay (s)	6.8			6.6	33.4	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			14.3	HCM Level of Service		B
HCM Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			72.6%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		0.95	1.00		1.00	0.95
Flt		0.94			1.00	0.85		1.00	0.85		1.00	1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1718			1842	1583		1770	3539		1770	3536
Flt Permitted		0.92			0.94	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1601			1747	1583		1770	3539		1770	3536
Volume (vph)	7	6	11	2	7	216	19	801	20	116	667	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	6	12	2	7	227	20	843	21	122	702	4
RTOR Reduction (vph)	0	10	0	0	0	196	0	0	10	0	0	0
Lane Group Flow (vph)	0	15	0	0	9	31	20	843	11	122	706	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		6.3			6.3	6.3	0.9	25.1	25.1	4.7	28.9	
Effective Green, g (s)		6.8			6.8	6.8	1.4	25.6	25.6	5.2	29.4	
Actuated g/C Ratio		0.14			0.14	0.14	0.03	0.52	0.52	0.10	0.59	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		219			240	217	50	1827	817	186	2096	
v/s Ratio Prot							0.01	c0.24		c0.07	c0.20	
v/s Ratio Perm		0.01			0.01	c0.02			0.01			
v/c Ratio		0.07			0.04	0.14	0.40	0.46	0.01	0.66	0.34	
Uniform Delay, d1		18.6			18.6	18.8	23.7	7.6	5.8	21.3	5.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.1	0.3	5.2	0.2	0.0	8.1	0.1	
Delay (s)		18.8			18.6	19.1	28.9	7.8	5.9	29.4	5.2	
Level of Service		B			B	B	C	A	A	C	A	
Approach Delay (s)		18.8			19.1			8.2			8.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay		9.9										
HCM Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		49.6										
Intersection Capacity Utilization		48.8%										
Analysis Period (min)		15										
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	22	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	23	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	24	1								
Volume Left	1	4	23	0								
Volume Right	3	2	1	0								
cSH	1359	1432	594	557								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.1	0.2	11.3	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.3	11.5								
Approach LOS		B	B									
Intersection Summary												
Average Delay		0.8										
Intersection Capacity Utilization		27.9%										
Analysis Period (min)		15										
ICU Level of Service A												

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		27.4%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		32.1%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	↖	←	↗	↖	↑	↗	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	112	14	102	13	953	206	544
v/c Ratio	0.09	0.55	0.05	0.32	0.11	0.87	0.85	0.38
Control Delay	18.2	42.3	29.3	9.5	42.2	26.8	67.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	42.3	29.3	9.5	42.2	26.8	67.0	6.3
Queue Length 50th (ft)	4	54	6	0	6	401	106	77
Queue Length 95th (ft)	23	105	22	40	25	#771	#246	241
Internal Link Dist (ft)	885	1130				954		1280
Turn Bay Length (ft)				35	150		150	
Base Capacity (vph)	387	305	411	429	120	1097	242	1433
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.37	0.03	0.24	0.11	0.87	0.85	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↖	←	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	11	276	521	223	45	737	33
v/c Ratio	0.06	0.67	0.76	0.20	0.12	0.81	0.09
Control Delay	35.3	28.2	24.6	5.9	24.6	10.7	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	28.2	24.6	5.9	24.6	10.7	19.5
Queue Length 50th (ft)	3	62	138	17	13	0	6
Queue Length 95th (ft)	21	#184	319	85	45	#137	31
Internal Link Dist (ft)		1130		2170	446		2150
Turn Bay Length (ft)							
Base Capacity (vph)	185	532	916	1283	535	994	509
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.52	0.57	0.17	0.08	0.74	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↙	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	63	821	122	782	323	155
v/c Ratio	0.47	0.83	0.88	0.75	0.55	0.94
Control Delay	47.8	24.4	83.8	11.5	9.4	87.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	24.4	83.8	11.5	9.4	87.7
Queue Length 50th (ft)	31	315	73	134	17	73
Queue Length 95th (ft)	#71	#555	m#161	132	86	#229
Internal Link Dist (ft)		1080		1070	911	2200
Turn Bay Length (ft)						
Base Capacity (vph)	133	991	139	1039	587	167
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.83	0.88	0.75	0.55	0.93

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↙	←	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	55	1083	197	865	131	234	156
v/c Ratio	0.36	1.10	0.75	0.72	0.58	0.52	0.67
Control Delay	33.3	81.6	46.6	18.5	40.5	9.3	39.8
Queue Delay	0.0	23.3	0.0	0.0	0.0	0.2	0.5
Total Delay	33.3	104.9	46.6	18.6	40.5	9.5	40.3
Queue Length 50th (ft)	24	~1108	108	401	61	4	61
Queue Length 95th (ft)	m35	m#1508	m#259	m792	110	60	118
Internal Link Dist (ft)		1070		550	687		2220
Turn Bay Length (ft)							
Base Capacity (vph)	151	987	262	1202	291	513	292
Starvation Cap Reductn	0	0	0	11	0	0	0
Spillback Cap Reductn	0	47	0	0	0	31	18
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.15	0.75	0.73	0.45	0.49	0.57

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	1142	191	728	568	215	163	279	475	256
v/c Ratio	0.71	0.65	0.81	0.71	0.57	0.97	0.56	0.72	0.77	1.00
Control Delay	84.4	39.5	79.2	27.4	13.0	122.0	77.8	18.3	69.2	114.2
Queue Delay	0.0	3.7	0.1	36.3	3.1	0.0	0.0	2.6	569.6	0.0
Total Delay	84.4	43.2	79.4	63.6	16.1	122.0	77.8	20.9	638.8	114.2
Queue Length 50th (ft)	122	592	201	456	101	228	87	0	247	251
Queue Length 95th (ft)	m130	m565	m247	m653	m134	#402	127	95	#351	#448
Internal Link Dist (ft)		550		220			110			270
Turn Bay Length (ft)						150		100	275	
Base Capacity (vph)	531	1750	597	1022	1000	221	376	418	619	257
Starvation Cap Reductn	0	503	64	336	320	0	0	0	0	0
Spillback Cap Reductn	0	106	0	0	0	0	0	61	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.92	0.36	1.06	0.84	0.97	0.43	0.78	2.26	1.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↗	↖	←	↖	↑	↖	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	169	5	32	228
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.59	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	28.4	24.6	40.0	4.3	3.8	35.8	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	28.4	24.6	40.0	4.3	3.8	35.8	11.4
Queue Length 50th (ft)	2	15	0	2	34	96	4	0	15	24
Queue Length 95th (ft)	13	39	49	m5	m54	m132	m38	m1	40	66
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	399	2462	1102	184	1919
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	991	731	94	769	345	1054
v/c Ratio	0.59	0.82	0.37	0.38	0.66	1.16dr
Control Delay	23.2	29.7	44.0	13.9	30.4	39.1
Queue Delay	5.8	30.9	0.0	0.1	0.0	6.7
Total Delay	29.0	60.6	44.0	13.9	30.4	45.8
Queue Length 50th (ft)	347	422	22	93	161	235
Queue Length 95th (ft)	375	514	m31	m115	261	#376
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1118
Starvation Cap Reductn	624	196	0	0	0	0
Spillback Cap Reductn	0	0	0	265	0	54
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.05	0.37	0.43	0.66	0.99

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	599	738	435	498	294	309	599	44	52
v/c Ratio	0.52	0.77	0.78	0.33	0.85	0.87	0.57	0.12	0.14
Control Delay	42.4	19.9	48.2	16.5	50.7	53.6	6.1	23.1	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	19.9	48.2	16.5	50.7	53.6	6.1	23.1	19.0
Queue Length 50th (ft)	141	315	120	110	107	113	0	22	23
Queue Length 95th (ft)	156	362	#180	147	#280	#296	58	42	43
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	957	558	1524	347	354	1050	365	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.77	0.78	0.33	0.85	0.87	0.57	0.12	0.14

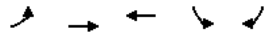
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel


2008 + Alternative B (Mitigated)
PM Peak



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1033	718	97	248
v/c Ratio	0.46	0.46	0.45	0.21	0.41
Control Delay	31.9	16.9	16.1	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	31.9	17.4	16.1	24.5	5.8
Queue Length 50th (ft)	61	237	122	38	0
Queue Length 95th (ft)	82	254	178	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1610	465	598
Starvation Cap Reductn	0	741	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.68	0.45	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	261	263	42	16	541	517	7	458	743
v/c Ratio	0.60	0.60	0.10	0.11	1.02	0.25	0.05	0.50	0.71
Control Delay	32.6	32.6	8.3	29.3	74.3	10.7	43.3	29.2	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Total Delay	32.6	32.6	8.3	29.3	74.3	10.7	43.3	29.2	10.2
Queue Length 50th (ft)	120	121	0	5	~278	51	4	128	224
Queue Length 95th (ft)	200	202	23	23	#478	147	m5	#225	#273
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2056	177	924	1041
Starvation Cap Reductn	0	0	0	0	0	0	0	0	128
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.59	0.09	0.09	1.02	0.25	0.04	0.50	0.81
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak







	↖	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	293	91	876	638	667
v/c Ratio	0.66	0.20	0.79	0.53	0.60
Control Delay	25.7	5.8	15.9	2.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	5.8	15.9	2.4	10.2
Queue Length 50th (ft)	90	0	197	0	124
Queue Length 95th (ft)	160	28	#455	35	228
Internal Link Dist (ft)	306		2550		954
Turn Bay Length (ft)					
Base Capacity (vph)	531	538	1155	1224	1155
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	0.17	0.76	0.52	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	683	831	264	235	724
v/c Ratio	0.62	1.05	1.07	0.33	0.86	0.62
Control Delay	29.1	65.7	76.2	3.1	59.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	65.7	76.2	3.1	59.2	10.1
Queue Length 50th (ft)	96	~188	~377	0	92	149
Queue Length 95th (ft)	168	#380	#576	38	#208	242
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	649	774	812	272	1175
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.05	1.07	0.33	0.86	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	643	38	213	987	162	67	97	85	284	149
v/c Ratio	0.40	0.70	0.09	0.71	0.86	0.26	0.25	0.21	0.18	0.86	0.20
Control Delay	44.6	30.7	7.8	55.1	17.1	1.1	37.5	10.4	7.5	57.2	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	30.7	7.8	55.1	17.1	1.1	37.5	10.4	7.5	57.2	7.9
Queue Length 50th (ft)	26	143	0	52	80	0	16	8	0	139	15
Queue Length 95th (ft)	61	198	21	m62	m100	m1	36	47	35	#272	55
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	1062	502	300	1144	619	264	468	460	332	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.61	0.08	0.71	0.86	0.26	0.25	0.21	0.18	0.86	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	749	154	391	1073	377	144	435	274	383	278	256
v/c Ratio	0.86	0.44	0.25	0.76	0.95	0.52	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	45.1	14.8	3.3	31.7	32.7	3.8	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	14.8	3.3	31.7	32.7	3.8	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	102	96	5	99	286	25	71	74	0	95	129	0
Queue Length 95th (ft)	m#196	m109	m11	m#148	#402	m33	#157	118	65	#188	#230	58
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1134	721	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.44	0.25	0.76	0.95	0.52	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1576	72	1460	209	25	370	370	369
v/c Ratio	0.68	0.51	0.73	0.13	0.05	0.84	0.88	0.67
Control Delay	9.3	48.0	21.0	0.1	9.8	43.2	48.5	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	48.0	21.0	0.1	9.8	43.2	48.5	27.4
Queue Length 50th (ft)	135	29	365	0	2	169	172	138
Queue Length 95th (ft)	172	m67	495	m0	18	#318	#329	230
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2318	142	2000	1583	568	475	455	592
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.51	0.73	0.13	0.04	0.78	0.81	0.62
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1728	287	1049	368	688	161	161	18
v/c Ratio	0.14	0.47	0.18	0.39	0.23	0.79	0.33	0.33	0.04
Control Delay	39.0	12.5	0.2	14.3	0.3	30.8	20.4	20.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	12.5	0.2	14.3	0.3	30.8	20.4	20.4	13.3
Queue Length 50th (ft)	10	170	0	92	0	160	63	63	5
Queue Length 95th (ft)	m13	m236	m0	202	0	180	92	92	16
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3689	1583	2673	1583	1415	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	89	0	0	0	0	41	41	42
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.48	0.18	0.39	0.23	0.49	0.21	0.21	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak













	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1209	574	148	1003	226	475	236	107	242	193
v/c Ratio	0.58	0.88	0.61	0.89	0.58	0.76	0.77	0.49	0.47	0.50	0.49
Control Delay	40.4	33.8	5.6	86.9	23.7	51.5	43.0	8.3	40.4	37.3	9.8
Queue Delay	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	38.3	5.7	86.9	23.7	51.5	43.0	8.3	40.4	37.3	9.8
Queue Length 50th (ft)	74	311	10	80	150	126	132	0	59	67	0
Queue Length 95th (ft)	121	#481	90	#202	209	#258	#214	61	113	104	56
Internal Link Dist (ft)	360		1350		601		660				
Turn Bay Length (ft)	250			200			250	175	150		
Base Capacity (vph)	486	1377	948	167	1729	310	641	496	298	627	450
Starvation Cap Reductn	0	116	13	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.96	0.61	0.89	0.58	0.73	0.74	0.48	0.36	0.39	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	509	213	135	620	364	338	520	114	382	360	231
v/c Ratio	0.90	0.71	0.43	0.87	0.86	0.59	0.84	0.95	0.21	1.01	0.69	0.38
Control Delay	89.7	35.6	7.3	83.5	44.4	7.8	50.0	57.3	5.7	83.8	34.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.7	35.6	7.3	83.5	44.4	7.8	50.0	57.3	5.7	83.8	34.1	5.5
Queue Length 50th (ft)	71	124	0	68	157	0	160	253	0	~197	163	0
Queue Length 95th (ft)	#176	177	54	#169	#245	69	#292	#445	36	#370	#266	51
Internal Link Dist (ft)	689		6630		734		980					
Turn Bay Length (ft)	350			450	500	150	550			675	500	625
Base Capacity (vph)	155	730	496	155	730	615	417	549	547	377	525	612
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.70	0.43	0.87	0.85	0.59	0.81	0.95	0.21	1.01	0.69	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	↗	←	↖	↗	↖	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	973	56	1033	351	51	91	511	132
v/c Ratio	0.67	0.79	0.47	0.96	0.60	0.43	0.44	0.80	0.18
Control Delay	64.2	36.1	37.4	39.3	8.4	52.2	21.8	35.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	36.1	37.4	39.3	8.4	52.2	21.8	35.9	5.8
Queue Length 50th (ft)	61	~312	29	~369	7	28	14	237	10
Queue Length 95th (ft)	#161	#453	m52	#475	103	65	57	#388	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	159	1234	118	1077	583	118	367	653	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.79	0.47	0.96	0.60	0.43	0.25	0.78	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	↗	←	↖	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	661	104	1203	673	223
v/c Ratio	0.58	0.80	0.39	0.58	0.61	0.40
Control Delay	11.0	13.3	52.0	25.3	28.6	18.2
Queue Delay	0.3	2.5	0.0	0.8	0.0	0.0
Total Delay	11.3	15.8	52.0	26.0	28.6	18.2
Queue Length 50th (ft)	105	79	60	324	164	64
Queue Length 95th (ft)	130	m#445	m98	395	222	127
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	828	295	2084	1106	559
Starvation Cap Reductn	176	80	0	521	0	0
Spillback Cap Reductn	78	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.88	0.35	0.77	0.61	0.40
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	625	248
v/c Ratio	0.66	0.28	0.73	0.60
Control Delay	7.5	7.3	35.8	31.9
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	7.6	7.4	35.8	31.9
Queue Length 50th (ft)	204	71	167	111
Queue Length 95th (ft)	252	123	203	170
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2341	2341	1221	580
Starvation Cap Reductn	187	0	0	0
Spillback Cap Reductn	0	261	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.31	0.51	0.43
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative B (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓	
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	9	227	20	843	21	122	706
v/c Ratio	0.09	0.03	0.50	0.10	0.44	0.02	0.42	0.30
Control Delay	13.7	17.2	7.6	23.9	10.4	5.2	22.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	17.2	7.6	23.9	10.4	5.2	22.6	5.6
Queue Length 50th (ft)	3	2	0	4	84	0	26	26
Queue Length 95th (ft)	19	12	45	22	158	10	78	114
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	526	562	649	204	2045	924	322	2431
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.35	0.10	0.41	0.02	0.38	0.29
Intersection Summary								

**CUMULATIVE 2020 + ALTERNATIVE B
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.93	1.00	1.00	0.85	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1725	1770	1863	1583	1770	1838	1770	1838	1770	1861	1861	1861
Flt Permitted	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1725	1770	1863	1583	1770	1838	1770	1838	1770	1861	1861	1861
Volume (vph)	0	13	16	143	22	134	14	763	74	223	508	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	14	17	151	23	141	15	803	78	235	535	3
RTOR Reduction (vph)	0	16	0	0	0	113	0	2	0	0	0	0
Lane Group Flow (vph)	0	15	0	151	23	28	15	879	0	235	538	0
Turn Type	Perm			Prot		Perm	Prot			Prot		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4					8						
Actuated Green, G (s)		4.3		15.4	24.2	24.2	2.0	69.5		18.9	86.4	
Effective Green, g (s)		4.8		15.9	24.7	24.7	2.5	70.0		19.4	86.9	
Actuated g/C Ratio		0.04		0.13	0.20	0.20	0.02	0.56		0.15	0.69	
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		66		223	365	310	35	1020		272	1282	
v/s Ratio Prot		c0.01		c0.09	0.01		0.01	c0.48		c0.13	0.29	
v/s Ratio Perm						0.02						
v/c Ratio		0.22		0.68	0.06	0.09	0.43	0.86		0.86	0.42	
Uniform Delay, d1		58.8		52.6	41.3	41.5	61.1	23.9		52.1	8.6	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7		7.9	0.1	0.1	8.2	7.6		23.6	0.2	
Delay (s)		60.5		60.5	41.4	41.6	69.3	31.5		75.6	8.8	
Level of Service		E		E	D	D	E	C		E	A	
Approach Delay (s)		60.5			50.7			32.2			29.1	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM Average Control Delay		34.3										
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		126.1						16.0				
Intersection Capacity Utilization		81.6%										
Analysis Period (min)		15										
c Critical Lane Group												



















2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	1.00	1.00	1.00	1.00	0.85	1.00	0.95	1.00	0.95
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.98	0.98
Satd. Flow (prot)	1770	1741	1770	1854	1770	1863	1583	1770	1863	1583	1750	1750
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.91	0.91
Satd. Flow (perm)	1770	1741	1770	1854	1770	1863	1583	1770	1863	1583	1627	1627
Volume (vph)	10	170	131	494	280	9	10	32	700	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	179	138	520	295	9	11	34	737	11	11	11
RTOR Reduction (vph)	0	28	0	0	1	0	0	0	570	0	9	0
Lane Group Flow (vph)	11	289	0	520	303	0	11	34	167	0	24	0
Turn Type												
Protected Phases		7	4		3	8		5	2		6	
Permitted Phases										2	6	
Actuated Green, G (s)		0.8	18.9		23.2	41.3		1.0	15.7	15.7	10.2	
Effective Green, g (s)		1.3	19.4		23.7	41.8		1.5	16.2	16.2	10.7	
Actuated g/C Ratio		0.02	0.27		0.33	0.59		0.02	0.23	0.23	0.15	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		32	474		588	1087		37	423	360	244	
v/s Ratio Prot		0.01	c0.17		c0.29	0.16		0.01	0.02			
v/s Ratio Perm										c0.11	0.01	
v/c Ratio		0.34	0.61		0.88	0.28		0.30	0.08	0.47	0.10	
Uniform Delay, d1		34.6	22.7		22.5	7.3		34.4	21.7	23.8	26.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		6.3	2.3		14.7	0.1		4.5	0.1	1.0	0.2	
Delay (s)		40.9	25.0		37.2	7.4		38.8	21.8	24.8	26.3	
Level of Service		D	C		D	A		D	C	C	C	
Approach Delay (s)		25.5			26.2			24.8			26.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		25.6										
HCM Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		71.3								12.0		
Intersection Capacity Utilization		73.6%										
Analysis Period (min)		15										
c Critical Lane Group												




















3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop		Stop		
Grade	0%			0%				0%		0%		
Volume (veh/h)	10	860	10	9	765	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	905	11	9	805	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	815			916			1772	1765	911	1771	1766	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815			916			1772	1765	911	1771	1766	810
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			81	87	97	81	87	97
cM capacity (veh/h)	813			745			56	82	332	55	82	380
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	916	9	815	32	32						
Volume Left	11	0	9	0	11	11						
Volume Right	0	11	0	9	11	11						
cSH	813	1700	745	1700	90	91						
Volume to Capacity	0.01	0.54	0.01	0.48	0.35	0.35						
Queue Length 95th (ft)	1	0	1	0	34	34						
Control Delay (s)	9.5	0.0	9.9	0.0	64.9	64.1						
Lane LOS	A		A		F	F						
Approach Delay (s)	0.1		0.1		64.9	64.1						
Approach LOS					F	F						
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			55.9%	ICU Level of Service		B						
Analysis Period (min)			15									








4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	10	860	10	9	765	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	905	11	9	805	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)	1160											
pX, platoon unblocked	0.70						0.70	0.70		0.70	0.70	0.70
vC, conflicting volume	815			916			1772	1765	911	1766	1761	805
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	735			916			2105	2096	911	2097	2090	721
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			45	70	97	46	70	96
cM capacity (veh/h)	608			745			19	35	332	19	36	298
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1					
Volume Total	11	916	9	805	9	32	32					
Volume Left	11	0	9	0	0	11	11					
Volume Right	0	11	0	0	9	11	11					
cSH	608	1700	745	1700	1700	36	36					
Volume to Capacity	0.02	0.54	0.01	0.47	0.01	0.88	0.87					
Queue Length 95th (ft)	1	0	1	0	0	80	79					
Control Delay (s)	11.0	0.0	9.9	0.0	0.0	279.6	276.3					
Lane LOS	B		A			F	F					
Approach Delay (s)	0.1		0.1			279.6	276.3					
Approach LOS						F	F					
Intersection Summary												
Average Delay			9.8									
Intersection Capacity Utilization			55.9%		ICU Level of Service				B			
Analysis Period (min)			15									










5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.88			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	
Satd. Flow (prot)	1770	3513		1770	3430			1635			1778	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.34	
Satd. Flow (perm)	1770	3513		1770	3430			1559			634	
Volume (vph)	40	799	41	188	730	189	44	14	396	180	31	11
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	841	43	198	768	199	46	15	417	189	33	12
RTOR Reduction (vph)	0	3	0	0	18	0	0	249	0	0	2	0
Lane Group Flow (vph)	42	881	0	198	949	0	0	229	0	0	232	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	3.8	38.8		18.3	53.3			39.4			39.4	
Effective Green, g (s)	4.3	39.3		18.8	53.8			39.9			39.9	
Actuated g/C Ratio	0.04	0.36		0.17	0.49			0.36			0.36	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	69	1255		303	1678			565			230	
v/s Ratio Prot	0.02	c0.25		c0.11	0.28							
v/s Ratio Perm								0.15			c0.37	
v/c Ratio	0.61	0.70		0.65	0.57			0.41			1.01	
Uniform Delay, d1	52.0	30.3		42.6	19.8			26.2			35.0	
Progression Factor	1.00	1.00		0.64	0.45			1.00			0.99	
Incremental Delay, d2	14.3	3.3		3.9	1.1			0.5			61.7	
Delay (s)	66.3	33.6		31.1	10.1			26.7			96.3	
Level of Service	E	C		C	B			C			F	
Approach Delay (s)		35.1			13.7			26.7			96.3	
Approach LOS		D			B			C			F	
Intersection Summary												
HCM Average Control Delay		29.9			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		87.0%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96			1.00	1.00	0.85	1.00	0.89
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3410			1770	1863	1583	1770	1655
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3410			1770	1863	1583	1770	1655
Volume (vph)	53	1049	273	509	845	273	143	105	559	217	41	119
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	1104	287	536	889	287	151	111	588	228	43	125
RTOR Reduction (vph)	0	0	168	0	25	0	0	0	34	0	105	0
Lane Group Flow (vph)	56	1104	119	536	1151	0	151	111	555	228	63	0
Turn Type	Prot			Perm	Prot		Prot		pm+ov	Prot		
Protected Phases	7	4			3		5		2	3		6
Permitted Phases				4						2		
Actuated Green, G (s)	6.8	41.4	41.4	23.4	58.0		17.6	11.9	35.3	15.3	9.6	
Effective Green, g (s)	7.3	41.9	41.9	23.9	58.5		18.1	12.4	36.3	15.8	10.1	
Actuated g/C Ratio	0.07	0.38	0.38	0.22	0.53		0.16	0.11	0.33	0.14	0.09	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	117	1348	603	746	1814		291	210	522	254	152	
v/s Ratio Prot	0.03	c0.31		0.16	0.34		0.09	0.06	c0.23	c0.13	0.04	
v/s Ratio Perm				0.07					0.12			
v/c Ratio	0.48	0.82	0.20	0.72	0.63		0.52	0.53	1.06	0.90	0.41	
Uniform Delay, d1	49.5	30.6	22.8	39.9	18.2		42.0	46.0	36.9	46.3	47.1	
Progression Factor	0.85	0.67	0.75	1.12	0.65		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	4.2	0.5	2.1	1.1		1.6	2.4	57.0	30.7	1.8	
Delay (s)	44.5	24.8	17.6	46.8	12.9		43.5	48.4	93.8	77.0	49.0	
Level of Service	D	C	B	D	B		D	D	F	E	D	
Approach Delay (s)		24.1			23.5			79.0			65.1	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM Average Control Delay		38.1			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		85.6%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.88	0.91	0.91	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	3539	2787	1610	3271	1583	3433	1648	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	3539	2787	1610	3271	1583	3433	1648	
Volume (vph)	157	1413	255	73	837	730	556	103	350	453	70	234
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	165	1487	268	77	881	768	585	108	368	477	74	246
RTOR Reduction (vph)	0	0	76	0	0	491	0	0	80	0	109	0
Lane Group Flow (vph)	165	1487	192	77	881	277	293	400	288	477	211	0
Turn Type	Prot	Perm	Prot	Perm	Split	Split	Perm	Split	Split	Perm	Split	Split
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases			4		8			2				
Actuated Green, G (s)	16.0	49.4	49.4	5.8	39.2	39.2	20.8	20.8	20.8	16.0	16.0	
Effective Green, g (s)	16.5	49.9	49.9	6.3	39.7	39.7	21.3	21.3	21.3	16.5	16.5	
Actuated g/C Ratio	0.15	0.45	0.45	0.06	0.36	0.36	0.19	0.19	0.19	0.15	0.15	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	266	1538	654	101	1277	1006	312	633	307	515	247	
v/s Ratio Prot	c0.09	c0.44		0.04	0.25		0.18	0.12		c0.14	0.13	
v/s Ratio Perm			0.13		0.10			c0.18				
v/c Ratio	0.62	0.97	0.29	0.76	0.69	0.28	0.94	0.90	0.94	0.93	0.86	
Uniform Delay, d1	43.8	29.2	18.9	51.1	29.9	24.9	43.7	40.7	43.7	46.1	45.6	
Progression Factor	0.88	0.68	0.45	1.14	1.00	2.14	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	8.5	0.1	21.9	2.3	0.5	34.8	2.1	35.1	22.7	23.9	
Delay (s)	40.3	28.5	8.7	80.1	32.2	53.8	78.5	42.8	78.8	68.9	69.5	
Level of Service	D	C	A	F	C	D	E	D	E	E	E	
Approach Delay (s)		26.7			43.9			65.1			69.1	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM Average Control Delay		45.7			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		92.6%			ICU Level of Service			F				
Analysis Period (min)		15										
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												






























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.89	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3030	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3030	
Volume (vph)	0	1461	758	77	937	0	0	0	0	355	288	700
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1538	798	81	986	0	0	0	0	374	303	737
RTOR Reduction (vph)	0	0	168	0	0	0	0	0	0	0	73	0
Lane Group Flow (vph)	0	1538	630	81	986	0	0	0	0	374	967	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4		3	8						6	
Permitted Phases			4									
Actuated Green, G (s)		53.9	53.9	4.4	62.8					38.2	38.2	
Effective Green, g (s)		54.4	54.4	4.9	63.3					38.7	38.7	
Actuated g/C Ratio		0.49	0.49	0.04	0.58					0.35	0.35	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1750	783	153	2037					566	1066	
v/s Ratio Prot		c0.43		0.02	c0.28							
v/s Ratio Perm			0.40							0.23	0.32	
v/c Ratio		0.88	0.80	0.53	0.48					0.66	1.22	dr
Uniform Delay, d1		24.9	23.3	51.4	13.7					30.1	33.9	
Progression Factor		0.58	0.38	1.00	1.00					1.00	1.00	
Incremental Delay, d2		2.3	2.9	3.3	0.8					6.0	12.6	
Delay (s)		16.6	11.8	54.7	14.6					36.1	46.6	
Level of Service		B	B	D	B					D	D	
Approach Delay (s)		15.0			17.6				0.0		43.8	
Approach LOS		B			B				A		D	
Intersection Summary												
HCM Average Control Delay		24.0			HCM Level of Service					C		
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)					12.0		
Intersection Capacity Utilization		87.5%			ICU Level of Service					E		
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

















10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0					
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	1.00					
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93						
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00						
Satd. Flow (prot)		5085	1583	3433	3520		1681	1690	2787	1770	1723						
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00						
Satd. Flow (perm)		5085	1583	3433	3520		1681	1690	2787	1770	1723						
Volume (vph)	0	770	1048	499	455	17	562	18	571	9	9		9		9		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Adj. Flow (vph)	0	811	1103	525	479	18	592	19	601	9	9		9		9		
RTOR Reduction (vph)	0	0	333	0	3	0	0	0	477	0	7		0		7		
Lane Group Flow (vph)	0	811	770	525	494	0	298	313	124	9	11		0		0		
Turn Type	Prot	pm+ov		Prot	Split		Perm		Split								
Protected Phases	7	4	2	3	8	2	2			6	6						
Permitted Phases		4						2									
Actuated Green, G (s)	17.5	33.5	12.5	34.5		16.0	16.0	16.0	16.0	16.0	16.0						
Effective Green, g (s)	18.0	34.5	13.0	35.0		16.5	16.5	16.5	16.5	16.5	16.5						
Actuated g/C Ratio	0.22	0.43	0.16	0.44		0.21	0.21	0.21	0.21	0.21	0.21						
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5						
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0						
Lane Grp Cap (vph)	1144	683	558	1540		347	349	575	365	355							
v/s Ratio Prot	0.16	c0.23	c0.15	0.14		0.18	0.19		0.01	c0.01							
v/s Ratio Perm		0.25						0.04									
v/c Ratio	0.71	1.13	0.94	0.32		0.86	0.90	0.22	0.02	0.03							
Uniform Delay, d1	28.6	22.8	33.1	14.7		30.6	30.9	26.4	25.3	25.4							
Progression Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00							
Incremental Delay, d2	3.7	75.3	24.3	0.6		23.1	28.0	0.9	0.1	0.2							
Delay (s)	32.3	98.0	57.4	15.3		53.8	58.9	27.2	25.5	25.5							
Level of Service	C	F	E	B		D	E	C	C	C							
Approach Delay (s)	70.2			36.9		41.9			25.5								
Approach LOS	E			D		D			C								
Intersection Summary																	
HCM Average Control Delay			53.5			HCM Level of Service			D								
HCM Volume to Capacity ratio			0.81														
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			16.0								
Intersection Capacity Utilization			92.5%			ICU Level of Service			F								
Analysis Period (min)			15														
c Critical Lane Group																	

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	 	 	 		 	 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1216	867	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1280	913	67	107	108
RTOR Reduction (vph)	0	0	4	0	0	84
Lane Group Flow (vph)	144	1280	976	0	107	24
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	9.7	77.0	62.8	24.0		24.0
Effective Green, g (s)	10.2	77.5	63.3	24.5		24.5
Actuated g/C Ratio	0.09	0.70	0.58	0.22		0.22
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	318	2493	2016	394		353
v/s Ratio Prot	0.04	c0.36	0.28	c0.06		
v/s Ratio Perm				0.02		
v/c Ratio	0.45	0.51	0.48	0.27		0.07
Uniform Delay, d1	47.3	7.5	13.7	35.4		33.7
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.0	0.8	0.8	1.7		0.4
Delay (s)	48.3	8.3	14.6	37.1		34.1
Level of Service	D	A	B	D		C
Approach Delay (s)	12.3		14.6	35.6		
Approach LOS	B		B	D		
Intersection Summary						
HCM Average Control Delay	15.1			HCM Level of Service		B
HCM Volume to Capacity ratio	0.46					
Actuated Cycle Length (s)	110.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	45.9%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	550	3	47	8	3	5	552	413	2	7	616	926
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	579	3	49	8	3	5	581	435	2	7	648	975
RTOR Reduction (vph)	0	0	43	0	5	0	0	0	0	0	0	161
Lane Group Flow (vph)	290	292	6	0	11	0	581	437	0	7	648	814
Turn Type	Split	Perm	Split		Prot		Prot		pm+ov			
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases			4									6
Actuated Green, G (s)	12.7	12.7	12.7		2.9		41.0	75.3		1.1	35.4	48.1
Effective Green, g (s)	13.2	13.2	13.2		3.4		41.5	75.8		1.6	35.9	49.1
Actuated g/C Ratio	0.12	0.12	0.12		0.03		0.38	0.69		0.01	0.33	0.45
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	202	202	190		54		668	2437		26	1155	707
v/s Ratio Prot	0.17	c0.17			c0.01		c0.33	0.12		0.00	0.18	c0.14
v/s Ratio Perm			0.00									0.38
v/c Ratio	1.44	1.45	0.03		0.21		0.87	0.18		0.27	0.56	1.15
Uniform Delay, d1	48.4	48.4	42.8		52.0		31.7	6.1		53.6	30.6	30.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	222.0	226.1	0.1		1.9		11.6	0.2		5.5	2.0	84.1
Delay (s)	270.4	274.5	42.8		53.9		43.4	6.2		59.1	32.5	114.5
Level of Service	F	F	D		D		D	A		E	C	F
Approach Delay (s)		254.6			53.9			27.4			81.7	
Approach LOS		F			D			C			F	
Intersection Summary												
HCM Average Control Delay		97.9			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.03										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		101.3%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												














13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583	1863	1583		1863
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1770	1583	1863	1583		1863
Volume (vph)	278	86	765	606	0	664
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	293	91	805	638	0	699
RTOR Reduction (vph)	0	68	0	264	0	0
Lane Group Flow (vph)	293	23	805	374	0	699
Turn Type	Perm		Perm			
Protected Phases	8		2			6
Permitted Phases		8		2		
Actuated Green, G (s)	12.6	12.6	29.4	29.4		29.4
Effective Green, g (s)	13.1	13.1	29.9	29.9		29.9
Actuated g/C Ratio	0.26	0.26	0.59	0.59		0.59
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	455	407	1092	928		1092
v/s Ratio Prot	c0.17		c0.43			0.38
v/s Ratio Perm		0.01		0.24		
v/c Ratio	0.64	0.06	0.74	0.40		0.64
Uniform Delay, d1	16.9	14.3	7.7	5.7		7.0
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	3.1	0.1	2.6	0.3		1.3
Delay (s)	20.0	14.4	10.3	6.0		8.3
Level of Service	B	B	B	A		A
Approach Delay (s)	18.7		8.4			8.3
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay		9.9		HCM Level of Service		A
HCM Volume to Capacity ratio		0.71				
Actuated Cycle Length (s)		51.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		62.3%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations				 	 		
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	144	31	12	359	363	25	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	152	33	13	378	382	26	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	609	204	408				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	609	204	408				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	64	96	99				
cM capacity (veh/h)	422	803	1147				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	152	33	13	189	189	255	154
Volume Left	152	0	13	0	0	0	0
Volume Right	0	33	0	0	0	0	26
cSH	422	803	1147	1700	1700	1700	1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15	0.09
Queue Length 95th (ft)	40	3	1	0	0	0	0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	16.7		0.3			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay	3.2						
Intersection Capacity Utilization	25.5%			ICU Level of Service		A	
Analysis Period (min)	15						













16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	580	790	253	268	675
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	611	832	266	282	711
RTOR Reduction (vph)	0	262	0	154	0	0
Lane Group Flow (vph)	266	349	832	112	282	711
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	14.9	14.9	26.5	26.5	9.5	40.5
Effective Green, g (s)	15.4	15.4	27.0	27.0	10.0	41.0
Actuated g/C Ratio	0.24	0.24	0.42	0.42	0.16	0.64
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	379	781	664	275	1186
v/s Ratio Prot	0.15		c0.45		c0.16	
v/s Ratio Perm	c0.22		0.07			
v/c Ratio	0.63	0.92	1.07	0.17	1.03	0.60
Uniform Delay, d1	21.9	23.9	18.7	11.7	27.2	6.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	27.4	51.0	0.5	61.0	2.2
Delay (s)	24.9	51.3	69.7	12.2	88.2	9.1
Level of Service	C	D	E	B	F	A
Approach Delay (s)	43.3		55.8			31.6
Approach LOS	D		E			C
Intersection Summary						
HCM Average Control Delay		44.0		HCM Level of Service		D
HCM Volume to Capacity ratio		1.02				
Actuated Cycle Length (s)		64.4		Sum of lost time (s)		12.0
Intersection Capacity Utilization		84.2%		ICU Level of Service		E
Analysis Period (min)		15				
c Critical Lane Group						













17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	648	53	116	855	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	682	56	122	900	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	39	0	0	68	0	56	69	0	63	0
Lane Group Flow (vph)	87	682	17	122	900	29	73	43	20	296	81	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	23.1	23.1	4.4	23.1	23.1	4.4	17.1	17.1	17.4	30.1	
Effective Green, g (s)	4.9	23.6	23.6	4.9	23.6	23.6	4.9	17.6	17.6	17.9	30.6	
Actuated g/C Ratio	0.06	0.30	0.30	0.06	0.30	0.30	0.06	0.22	0.22	0.22	0.38	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	1044	467	210	1044	467	210	347	331	396	637	
v/s Ratio Prot	0.05	c0.19		0.04	c0.25		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.02			0.01			
v/c Ratio	0.81	0.65	0.04	0.58	0.86	0.06	0.35	0.12	0.06	0.75	0.13	
Uniform Delay, d1	37.1	24.6	20.1	36.6	26.7	20.2	36.0	25.0	24.7	28.9	16.0	
Progression Factor	1.00	1.00	1.00	1.32	0.44	0.20	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	33.9	1.5	0.0	2.2	4.2	0.0	1.0	0.7	0.3	7.5	0.4	
Delay (s)	70.9	26.1	20.1	50.3	16.0	4.1	37.0	25.7	25.0	36.5	16.4	
Level of Service	E	C	C	D	B	A	D	C	C	D	B	
Approach Delay (s)		30.4			18.7			28.6			29.9	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM Average Control Delay		25.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		61.6%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Volume (vph)	216	763	163	377	966	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	803	172	397	1017	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	200	0	70	265	0	0	198
Lane Group Flow (vph)	227	803	57	397	1017	135	182	443	102	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.16		0.12	c0.29		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.09			0.07			0.03
v/c Ratio	0.81	0.48	0.11	0.77	0.89	0.26	0.87	0.71	0.36	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.4	18.7	32.7	25.9	20.1	34.6	30.1	28.0	34.0	30.7	26.3
Progression Factor	0.63	0.70	0.66	0.79	0.75	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.6	0.8	0.3	5.2	8.3	0.9	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	34.1	15.7	12.6	30.9	27.8	11.2	63.7	33.9	28.8	45.1	46.1	26.5
Level of Service	C	B	B	C	C	B	E	C	C	D	D	C
Approach Delay (s)		18.8			25.3			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		29.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		77.4%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2020 + Alternative B (Mitigated)

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑↑↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Flt	0.97	1.00	1.00	1.00	0.85	0.90	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	0.95	1.00	1.00	1.00	0.99	0.95	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	4920	1770	3539	1583	1583	1653	1681	1686	1583	1583	1686	1583
Flt Permitted	1.00	0.95	1.00	1.00	1.00	0.93	0.74	0.71	1.00	1.00	0.71	1.00
Satd. Flow (perm)	4920	1770	3539	1583	1583	1549	1312	1255	1583	1583	1255	1583
Volume (vph)	0	1263	349	68	1225	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1329	367	72	1289	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	57	0	0	0	0	0	12	0	0	0	29
Lane Group Flow (vph)	0	1639	0	72	1289	268	0	12	0	322	322	420
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases	4			3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)	36.7			4.8	46.0	80.0		25.0		25.0	25.0	25.0
Effective Green, g (s)	37.2			5.3	46.5	80.0		25.5		25.5	25.5	25.5
Actuated g/C Ratio	0.47			0.07	0.58	1.00		0.32		0.32	0.32	0.32
Clearance Time (s)	4.5			4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2288			117	2057	1583		494		418	400	505
v/s Ratio Prot	c0.33			0.04	c0.36							
v/s Ratio Perm						0.17		0.01		0.25	0.26	c0.27
v/c Ratio	0.72			0.62	0.63	0.17		0.02		0.77	0.81	0.83
Uniform Delay, d1	17.2			36.4	11.0	0.0		18.7		24.6	25.0	25.3
Progression Factor	0.46			1.00	1.44	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5			7.9	1.2	0.2		0.0		8.5	11.2	11.1
Delay (s)	9.5			44.5	17.1	0.2		18.7		33.1	36.2	36.4
Level of Service	A			D	B	A		B		C	D	D
Approach Delay (s)	9.5				15.5			18.7			35.4	
Approach LOS	A				B			B			D	
Intersection Summary												
HCM Average Control Delay	18.1					HCM Level of Service		B				
HCM Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	80.0					Sum of lost time (s)		12.0				
Intersection Capacity Utilization	73.6%					ICU Level of Service		D				
Analysis Period (min)	15											
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2020 + Alternative B (Mitigated)
























Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	1.00	1.00	0.85	0.98
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.96
Satd. Flow (prot)	1770	6408	1583	5085	1583	3433	1504	1504	1748	1748	1504	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	1.00	1.00	0.82	0.82
Satd. Flow (perm)	1770	6408	1583	5085	1583	2695	1504	1504	1487	1487	1504	1487
Volume (vph)	21	1567	298	0	853	383	690	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1649	314	0	898	403	726	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	1	1	0	2	0	0
Lane Group Flow (vph)	22	1649	314	0	898	403	726	180	181	0	16	0
Turn Type		Prot			Free		Free	Perm		Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases			Free			Free	2		2		6	
Actuated Green, G (s)	2.2	43.8	80.0		37.1	80.0	27.2	27.2	27.2		27.2	
Effective Green, g (s)	2.7	44.3	80.0		37.6	80.0	27.7	27.7	27.7		27.7	
Actuated g/C Ratio	0.03	0.55	1.00		0.47	1.00	0.35	0.35	0.35		0.35	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3548	1583		2390	1583	933	521	521		515	
v/s Ratio Prot	0.01	c0.26			0.18			0.12				
v/s Ratio Perm			0.20			0.25	c0.27		0.12		0.01	
v/c Ratio	0.37	0.46	0.20		0.38	0.25	0.78	0.34	0.35		0.03	
Uniform Delay, d1	37.8	10.7	0.0		13.6	0.0	23.4	19.4	19.4		17.3	
Progression Factor	1.10	1.19	1.00		1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.5	0.3	0.2		0.5	0.4	4.1	0.4	0.4		0.0	
Delay (s)	44.3	13.1	0.2		14.1	0.4	27.5	19.8	19.8		17.3	
Level of Service	D	B	A		B	A	C	B	B		B	
Approach Delay (s)	11.4				9.9			25.0			17.3	
Approach LOS	B				A			C			B	
Intersection Summary												
HCM Average Control Delay	14.3					HCM Level of Service		B				
HCM Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	80.0					Sum of lost time (s)		8.0				
Intersection Capacity Utilization	51.5%					ICU Level of Service		A				
Analysis Period (min)	15											
c Critical Lane Group												

























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	4913		1610	3330	1583	1610	3387	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	4913		1610	3330	1583	1610	3387	1583
Volume (vph)	235	1232	462	165	694	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1297	486	174	731	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	325	0	57	0	0	0	207	0	0	133
Lane Group Flow (vph)	247	1297	161	174	887	0	229	483	47	180	381	27
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	10.0	28.2	28.2	10.9	29.1		15.6	15.6	15.6	14.2	14.2	14.2
Effective Green, g (s)	10.5	28.7	28.7	11.4	29.6		16.1	16.1	16.1	14.7	14.7	14.7
Actuated g/C Ratio	0.12	0.33	0.33	0.13	0.34		0.19	0.19	0.19	0.17	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	415	1679	523	232	1673		298	617	293	272	573	268
v/s Ratio Prot	0.07	c0.26		c0.10	0.18		0.14	c0.15		0.11	c0.11	
v/s Ratio Perm			0.10						0.03			0.02
v/c Ratio	0.60	0.77	0.31	0.75	0.53		0.77	0.78	0.16	0.66	0.66	0.10
Uniform Delay, d1	36.2	26.2	21.7	36.4	23.1		33.6	33.7	29.7	33.8	33.8	30.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	3.5	1.5	12.8	1.2		11.3	6.4	0.3	5.9	2.9	0.2
Delay (s)	38.5	29.7	23.2	49.1	24.3		44.9	40.2	30.0	39.7	36.7	30.7
Level of Service	D	C	C	D	C		D	D	C	D	D	C
Approach Delay (s)		29.2			28.1			38.6			36.1	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay	31.9			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.75											
Actuated Cycle Length (s)	86.9			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	69.1%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3390	1441	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3390	1441	1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	149	583	228	140	661	356	323	483	113	322	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	375	340	508	119	339	377	247
RTOR Reduction (vph)	0	0	187	0	0	287	0	0	82	0	0	175
Lane Group Flow (vph)	157	614	53	147	696	88	340	508	37	339	377	72
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Perm	
Protected Phases	7	4	3		8	5		2	1		6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.5	19.5	19.5	7.5	18.5	18.5	19.4	27.5	27.5	17.5	25.6	25.6
Effective Green, g (s)	9.0	20.0	20.0	8.0	19.0	19.0	19.9	28.0	28.0	18.0	26.1	26.1
Actuated g/C Ratio	0.10	0.22	0.22	0.09	0.21	0.21	0.22	0.31	0.31	0.20	0.29	0.29
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	753	320	157	747	334	391	580	492	354	540	459
v/s Ratio Prot	c0.09	0.18	0.08		c0.20	0.19		c0.27	c0.19		0.20	
v/s Ratio Perm	0.04			0.06			0.02			0.05		
v/c Ratio	0.89	0.82	0.17	0.94	0.93	0.26	0.87	0.88	0.08	0.96	0.70	0.16
Uniform Delay, d1	40.0	33.2	28.3	40.7	34.9	29.7	33.8	29.4	21.9	35.6	28.4	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.2	6.8	0.2	52.7	18.3	0.4	18.2	16.8	0.3	36.4	7.3	0.7
Delay (s)	77.2	40.0	28.5	93.5	53.2	30.1	52.0	46.2	22.2	72.0	35.8	24.5
Level of Service	E	D	C	F	D	C	D	D	C	E	D	C
Approach Delay (s)	43.1			50.9			45.3			45.6		
Approach LOS	D			D			D			D		
Intersection Summary												
HCM Average Control Delay	46.5			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.86											
Actuated Cycle Length (s)	90.0			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	83.1%			ICU Level of Service					E			
Analysis Period (min)	15											
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3521		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3521		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	923	32	53	1040	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	972	34	56	1095	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	2	0	0	0	78	0	58	0	0	73	0
Lane Group Flow (vph)	128	1004	0	56	1095	349	51	33	0	623	72	0
Turn Type	Prot			Prot	pm+ov		Prot			Prot		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.5	42.3		4.3	38.1	78.7	6.4	6.7		40.6	40.9	
Effective Green, g (s)	9.0	42.8		4.8	38.6	79.7	6.9	7.2		41.1	41.4	
Actuated g/C Ratio	0.08	0.38		0.04	0.34	0.71	0.06	0.06		0.37	0.37	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	1347		76	1221	1127	109	108		650	606	
v/s Ratio Prot	c0.07	0.29		0.03	c0.31	0.11	c0.03	0.02		c0.35	0.04	
v/s Ratio Perm						0.11						
v/c Ratio	0.90	0.75		0.74	0.90	0.31	0.47	0.31		0.96	0.12	
Uniform Delay, d1	51.0	29.8		52.9	34.8	5.9	50.7	50.0		34.6	23.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	47.2	3.8		30.7	10.5	0.2	3.2	1.6		25.1	0.1	
Delay (s)	98.2	33.6		83.6	45.2	6.1	53.9	51.6		59.7	23.3	
Level of Service	F	C		F	D	A	D	D		E	C	
Approach Delay (s)		40.9			36.0			52.4			52.8	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay		41.7			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		111.9			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		85.4%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95						0.97	1.00	
Frt	1.00	0.85	1.00	1.00						1.00	0.85	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	1770	3539						3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	1770	3539						3433	1583	
Volume (vph)	0	953	627	66	1241	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	660	69	1306	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	142	0	0	0	0	0	0	0	38	0
Lane Group Flow (vph)	0	1003	518	69	1306	0	0	0	0	674	234	0
Turn Type		Perm	Prot							Prot		
Protected Phases		4	3	8						1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		0.28		0.04	c0.37					c0.20	0.15	
v/s Ratio Perm			c0.33									
v/c Ratio		0.69	0.80	0.29	0.63					0.61	0.46	
Uniform Delay, d1		21.9	23.3	35.1	12.1					25.7	24.3	
Progression Factor		1.00	1.00	1.29	1.76					1.00	1.00	
Incremental Delay, d2		2.7	9.9	0.6	1.3					1.0	3.0	
Delay (s)		24.6	33.2	46.0	22.4					26.7	27.2	
Level of Service		C	C	D	C					C	C	
Approach Delay (s)		28.0			23.6				0.0		26.8	
Approach LOS		C			C				A		C	
Intersection Summary												
HCM Average Control Delay		26.2			HCM Level of Service					C		
HCM Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)					8.0		
Intersection Capacity Utilization		70.7%			ICU Level of Service					C		
Analysis Period (min)		15										
c Critical Lane Group												

2020 + Alternative B (Mitigated)
PM Peak

26: Millbrae Ave & Stony Point Road Graton Rancheria Casino & Hotel	2020 + Alternative B (Mitigated) PM Peak
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Page 23

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	265	2	23	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	24	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	26	1								
Volume Left	1	7	24	0								
Volume Right	5	2	2	0								
cSH	1281	1402	519	488								
Volume to Capacity	0.00	0.01	0.05	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.1	0.2	12.3	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.3	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization		33.6%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel











2020 + Alternative B (Mitigated)
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			193			493	493	181	521	505	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			193			493	493	181	521	505	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			75	100	97	100	100	100
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	193	275	147	0								
Volume Left	0	38	120	0								
Volume Right	24	0	27	0								
cSH	1330	1381	519	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	29	0								
Control Delay (s)	0.0	1.3	14.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.3	14.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		41.6%			ICU Level of Service				A			
Analysis Period (min)		15										

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	→	↘	←	↙	↖	↑	↗	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	151	23	141	15	881	235	538
v/c Ratio	0.26	0.65	0.07	0.34	0.18	0.87	0.83	0.40
Control Delay	41.0	65.3	39.7	8.6	68.1	35.7	76.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	65.3	39.7	8.6	68.1	35.7	76.1	10.7
Queue Length 50th (ft)	11	123	16	0	12	618	197	157
Queue Length 95th (ft)	46	201	39	52	38	#1034	#390	353
Internal Link Dist (ft)	885		1130			954		1280
Turn Bay Length (ft)				35	150		150	
Base Capacity (vph)	234	365	616	617	84	1048	283	1337
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.41	0.04	0.23	0.18	0.84	0.83	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↘	→	↙	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	11	317	520	304	11	34	737	33
v/c Ratio	0.07	0.72	0.80	0.25	0.07	0.09	0.82	0.12
Control Delay	38.5	34.3	31.2	8.1	37.3	22.6	10.5	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	34.3	31.2	8.1	37.3	22.6	10.5	21.2
Queue Length 50th (ft)	4	92	159	25	4	12	0	8
Queue Length 95th (ft)	23	#308	#460	169	22	33	87	34
Internal Link Dist (ft)		1130		2170		446		2150
Turn Bay Length (ft)								
Base Capacity (vph)	153	495	771	1245	221	717	1063	444
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.64	0.67	0.24	0.05	0.05	0.69	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↗	→	↘	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	42	884	198	967	478	234
v/c Ratio	0.39	0.67	0.72	0.55	0.59	0.89
Control Delay	60.7	33.4	41.6	10.4	7.8	65.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	33.4	41.6	10.4	7.8	65.1
Queue Length 50th (ft)	29	283	121	110	39	143
Queue Length 95th (ft)	67	380	#230	187	121	#272
Internal Link Dist (ft)		1080		1070	911	2200
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	108	1318	274	1752	890	309
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.67	0.72	0.55	0.54	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↗	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	56	1104	287	536	1176	151	111	588	228	168
v/c Ratio	0.41	0.80	0.37	0.75	0.63	0.52	0.53	1.08	0.90	0.65
Control Delay	48.1	25.0	3.8	50.6	13.0	49.1	54.5	84.8	82.3	28.8
Queue Delay	0.0	0.9	0.0	0.0	0.1	0.0	0.0	0.8	0.0	0.0
Total Delay	48.1	25.9	3.8	50.6	13.1	49.1	54.5	85.5	82.3	28.8
Queue Length 50th (ft)	42	180	0	209	206	98	75	~309	160	35
Queue Length 95th (ft)	m63	m#492	m42	m254	m280	168	127	#426	#301	100
Internal Link Dist (ft)		1070			550		687			2220
Turn Bay Length (ft)	150			150						
Base Capacity (vph)	145	1377	782	718	1865	292	288	543	257	396
Starvation Cap Reductn	0	0	0	0	95	0	0	0	0	0
Spillback Cap Reductn	0	90	0	0	0	0	0	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.86	0.37	0.75	0.66	0.52	0.39	1.08	0.89	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	165	1487	268	77	881	768	293	400	368	477	320
v/c Ratio	0.62	0.97	0.37	0.77	0.69	0.51	0.94	0.90dl	0.95	0.93	0.90
Control Delay	43.6	29.8	4.7	92.0	32.6	4.8	82.4	45.9	68.5	71.8	56.2
Queue Delay	0.0	4.6	0.0	0.0	10.0	0.3	0.0	0.0	5.2	342.4	0.0
Total Delay	43.6	34.4	4.7	92.0	42.5	5.2	82.4	45.9	73.7	414.2	56.2
Queue Length 50th (ft)	114	424	17	55	311	34	226	143	196	173	138
Queue Length 95th (ft)	m131	m#454	m20	m#105	m366	m58	#409	199	#385	#271	#304
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	266	1553	736	100	1277	1497	312	634	386	515	356
Starvation Cap Reductn	0	21	0	0	370	262	0	0	0	0	0
Spillback Cap Reductn	0	51	0	0	0	0	0	0	11	246	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.99	0.36	0.77	0.97	0.62	0.94	0.63	0.98	1.77	0.90

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1538	798	81	986	374	1040
v/c Ratio	0.86	0.83	0.43	0.48	0.66	1.22dr
Control Delay	16.9	9.0	57.9	14.7	36.9	43.3
Queue Delay	59.6	15.4	0.0	0.6	0.3	0.4
Total Delay	76.5	24.4	57.9	15.3	37.1	43.7
Queue Length 50th (ft)	342	119	28	203	242	347
Queue Length 95th (ft)	m423	m68	54	254	361	#487
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1779	961	187	2037	566	1140
Starvation Cap Reductn	417	165	0	601	0	0
Spillback Cap Reductn	19	0	0	305	19	9
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.13	1.00	0.43	0.69	0.68	0.92

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	811	1103	525	497	298	313	601	9	18
v/c Ratio	0.71	1.09	0.94	0.32	0.86	0.90	0.57	0.02	0.05
Control Delay	32.6	65.1	61.0	15.3	56.0	61.4	5.0	25.7	18.8
Queue Delay	0.1	41.9	8.4	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	32.7	107.0	69.4	15.3	56.0	61.4	5.1	25.7	18.8
Queue Length 50th (ft)	137	~265	135	81	152	161	0	4	4
Queue Length 95th (ft)	180	#783	#229	116	#295	#314	44	16	21
Internal Link Dist (ft)	466		345		380			270	
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	1015	558	1544	347	349	1052	365	363
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	24	84	28	0	0	0	53	0	34
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.18	0.99	0.32	0.86	0.90	0.60	0.02	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel










2020 + Alternative B (Mitigated)
PM Peak

	↘	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1280	980	107	108
v/c Ratio	0.45	0.51	0.48	0.27	0.25
Control Delay	51.5	8.4	14.9	37.6	8.2
Queue Delay	0.0	2.0	0.0	0.0	0.0
Total Delay	51.5	10.4	14.9	37.6	8.2
Queue Length 50th (ft)	50	194	200	63	0
Queue Length 95th (ft)	80	239	267	113	45
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	749	2493	2021	394	437
Starvation Cap Reductn	0	1008	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.86	0.48	0.27	0.25

Intersection Summary

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	290	292	49	16	581	437	7	648	975
v/c Ratio	1.44	1.45	0.21	0.14	0.95	0.17	0.07	0.48	1.00
Control Delay	262.0	263.0	15.1	41.3	62.5	5.1	51.1	28.0	49.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.1
Total Delay	262.0	263.0	15.1	41.3	62.5	5.1	51.1	28.0	95.7
Queue Length 50th (ft)	~307	~310	0	8	390	25	5	165	477
Queue Length 95th (ft)	#486	#490	36	30	#609	89	20	260	#975
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	201	202	232	131	628	2641	97	1361	971
Starvation Cap Reductn	0	0	0	0	0	0	0	0	107
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.44	1.45	0.21	0.12	0.93	0.17	0.07	0.48	1.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.






Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

					
Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	293	91	805	638	699
v/c Ratio	0.65	0.19	0.74	0.54	0.64
Control Delay	24.3	5.7	13.6	2.5	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	5.7	13.6	2.5	11.1
Queue Length 50th (ft)	76	0	158	0	125
Queue Length 95th (ft)	160	28	318	35	247
Internal Link Dist (ft)	306		2550		954
Turn Bay Length (ft)					
Base Capacity (vph)	552	557	1162	1228	1162
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.16	0.69	0.52	0.60

Intersection Summary

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	611	832	266	282	711
v/c Ratio	0.63	0.95	1.06	0.33	1.03	0.60
Control Delay	29.5	39.5	72.9	3.1	93.3	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	39.5	72.9	3.1	93.3	9.7
Queue Length 50th (ft)	94	107	~377	0	~124	144
Queue Length 95th (ft)	164	#310	#577	38	#257	234
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	649	782	818	275	1187
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.94	1.06	0.33	1.03	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	682	56	122	900	97	73	99	89	296	144
v/c Ratio	0.64	0.65	0.11	0.47	0.86	0.18	0.28	0.23	0.21	0.79	0.20
Control Delay	59.5	28.0	6.8	50.6	18.1	1.4	38.1	11.9	7.8	46.7	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	28.0	6.8	50.6	18.1	1.4	38.1	11.9	7.8	46.7	7.4
Queue Length 50th (ft)	43	154	0	29	68	1	18	11	0	141	14
Queue Length 95th (ft)	#111	212	25	m37	m111	m1	38	52	37	#263	51
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	135	1062	514	257	1062	543	257	437	432	376	735
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.64	0.11	0.47	0.85	0.18	0.28	0.23	0.21	0.79	0.20

Intersection Summary


95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	803	172	397	1017	335	182	513	367	357	317	248
v/c Ratio	0.81	0.48	0.27	0.77	0.90	0.47	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	41.2	16.0	3.2	34.8	29.7	3.9	73.5	31.9	12.0	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	16.0	3.2	34.8	29.7	3.9	73.5	31.9	12.0	51.7	51.3	7.3
Queue Length 50th (ft)	86	105	6	107	282	24	92	108	16	92	151	0
Queue Length 95th (ft) m#191	122	m13	m#150	m#373	m29	#210	163	106	#172	#279	57	
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1133	708	210	753	565	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.48	0.27	0.77	0.90	0.47	0.87	0.68	0.65	0.81	0.80	0.47

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1696	72	1289	268	24	322	322	449
v/c Ratio	0.71	0.50	0.63	0.17	0.05	0.77	0.81	0.84
Control Delay	9.4	47.5	18.8	0.2	9.5	37.1	40.7	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	47.5	18.8	0.2	9.5	37.1	40.7	37.6
Queue Length 50th (ft)	145	28	316	0	2	141	143	176
Queue Length 95th (ft)	182	m67	431	m0	17	238	#267	#302
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2399	143	2057	1583	576	476	455	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.50	0.63	0.17	0.04	0.68	0.71	0.75

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1649	314	898	403	726	181	182	18
v/c Ratio	0.17	0.47	0.20	0.35	0.25	0.78	0.35	0.35	0.03
Control Delay	40.6	14.5	0.2	14.9	0.4	28.9	19.5	19.6	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	14.5	0.2	14.9	0.4	28.9	19.5	19.6	12.3
Queue Length 50th (ft)	12	173	0	81	0	165	69	69	5
Queue Length 95th (ft)	m16	243	m0	177	0	183	97	98	15
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3545	1583	2559	1583	1415	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	23	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.47	0.20	0.35	0.25	0.51	0.23	0.23	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1297	486	174	944	229	483	254	180	381	160
v/c Ratio	0.60	0.77	0.57	0.75	0.55	0.77	0.78	0.51	0.66	0.66	0.40
Control Delay	43.4	30.6	5.3	58.5	22.9	52.7	44.2	8.3	46.6	40.2	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	30.6	5.3	58.5	22.9	52.7	44.2	8.3	46.6	40.2	8.8
Queue Length 50th (ft)	69	245	0	97	145	136	144	0	104	110	0
Queue Length 95th (ft)	108	301	69	#194	187	#256	#208	63	181	160	52
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	433	1678	848	243	1731	312	646	512	300	631	425
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.77	0.57	0.72	0.55	0.73	0.75	0.50	0.60	0.60	0.38
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↗	→	↘	↙	←	↖	↗	→	↘	↙	←	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	614	240	147	696	375	340	508	119	339	377	247
v/c Ratio	0.89	0.82	0.47	0.94	0.93	0.60	0.87	0.88	0.21	0.96	0.70	0.39
Control Delay	85.7	43.4	7.6	100.2	56.0	8.6	56.9	47.6	5.5	76.0	37.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.7	43.4	7.6	100.2	56.0	8.6	56.9	47.6	5.5	76.0	37.1	5.5
Queue Length 50th (ft)	90	182	0	85	205	5	184	272	0	192	194	0
Queue Length 95th (ft)	#203	#268	64	#200	#314	81	#326	#452	37	#360	#299	55
Internal Link Dist (ft)		689			6630			734			980	
Turn Bay Length (ft)	350		450	500		150	550		675	500		625
Base Capacity (vph)	177	753	507	157	747	621	408	580	574	354	541	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.82	0.47	0.94	0.93	0.60	0.83	0.88	0.21	0.96	0.70	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	↗	→	↘	↙	←	↖	↗	→	↘	↙	←	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT			
Lane Group Flow (vph)	128	1006	56	1095	427	51	91	623	145			
v/c Ratio	0.88	0.73	0.59	0.90	0.35	0.40	0.49	0.94	0.21			
Control Delay	100.8	34.2	77.7	47.0	2.0	59.4	29.1	58.4	7.6			
Queue Delay	0.0	0.4	0.0	35.2	0.1	0.0	0.1	0.2	0.0			
Total Delay	100.8	34.6	77.7	82.2	2.1	59.4	29.2	58.6	7.6			
Queue Length 50th (ft)	92	333	40	393	13	35	20	430	13			
Queue Length 95th (ft)	#219	443	#104	#564	36	78	71	#708	56			
Internal Link Dist (ft)		6630		350			200		236			
Turn Bay Length (ft)	225		150		80	50		225				
Base Capacity (vph)	145	1373	95	1210	1220	141	284	661	748			
Starvation Cap Reductn	0	0	0	189	146	0	0	0	0			
Spillback Cap Reductn	0	79	0	0	0	0	8	1	0			
Storage Cap Reductn	0	0	0	0	0	0	0	0	0			
Reduced v/c Ratio	0.88	0.78	0.59	1.07	0.40	0.36	0.33	0.94	0.19			

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	660	69	1306	674	272
v/c Ratio	0.67	0.82	0.27	0.63	0.61	0.50
Control Delay	25.3	26.0	45.1	22.9	28.6	23.0
Queue Delay	0.4	0.5	0.0	0.6	0.0	0.6
Total Delay	25.8	26.6	45.1	23.5	28.6	23.6
Queue Length 50th (ft)	256	233	39	350	164	97
Queue Length 95th (ft)	331	#458	m67	421	222	173
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	805	295	2084	1106	548
Starvation Cap Reductn	149	21	0	378	0	0
Spillback Cap Reductn	63	0	0	338	0	82
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.84	0.23	0.77	0.61	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative B (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	651	287
v/c Ratio	0.73	0.31	0.72	0.67
Control Delay	6.7	8.2	34.6	35.1
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	6.8	8.2	34.6	35.1
Queue Length 50th (ft)	197	84	174	137
Queue Length 95th (ft)	250	146	204	197
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2298	2298	1221	574
Starvation Cap Reductn	60	0	0	0
Spillback Cap Reductn	0	211	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.34	0.53	0.50

Intersection Summary

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel





















2020 + Alternative B (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	50	254	7	857	27	139	750
v/c Ratio	0.09	0.19	0.54	0.04	0.48	0.03	0.45	0.31
Control Delay	15.4	19.3	8.0	23.6	12.3	5.2	23.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	19.3	8.0	23.6	12.3	5.2	23.0	5.6
Queue Length 50th (ft)	4	12	0	2	93	0	32	32
Queue Length 95th (ft)	20	36	47	12	170	12	86	125
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	475	484	640	189	1881	854	349	2434
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.10	0.40	0.04	0.46	0.03	0.40	0.31
Intersection Summary								

**NEAR-TERM 2008 + ALTERNATIVE C
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.91			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1699			1777	1583	1770	1863	1583	1770	1861	
Flt Permitted		1.00			0.72	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1699			1337	1583	1770	1863	1583	1770	1861	
Volume (vph)	0	8	14	332	13	172	12	758	317	196	514	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	15	349	14	181	13	798	334	206	541	3
RTOR Reduction (vph)	0	11	0	0	0	49	0	0	176	0	0	0
Lane Group Flow (vph)	0	12	0	0	363	132	13	798	158	206	544	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		24.7			24.7	24.7	1.1	42.6	42.6	10.5	52.0	
Effective Green, g (s)		25.2			25.2	25.2	1.6	43.1	43.1	11.0	52.5	
Actuated g/C Ratio		0.28			0.28	0.28	0.02	0.47	0.47	0.12	0.58	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		469			369	437	31	879	747	213	1070	
v/s Ratio Prot		0.01					0.01	c0.43		c0.12	0.29	
v/s Ratio Perm					c0.27	0.08			0.10			
v/c Ratio		0.03			0.98	0.30	0.42	0.91	0.21	0.97	0.51	
Uniform Delay, d1		24.1			32.8	26.1	44.4	22.3	14.1	40.0	11.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0			42.2	0.4	8.9	12.9	0.1	51.7	0.4	
Delay (s)		24.1			75.1	26.5	53.3	35.2	14.3	91.7	12.0	
Level of Service		C			E	C	D	D	B	F	B	
Approach Delay (s)		24.1			58.9			29.3			33.9	
Approach LOS		C			E			C			C	
Intersection Summary												
HCM Average Control Delay			37.2		HCM Level of Service						D	
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			91.3		Sum of lost time (s)						12.0	
Intersection Capacity Utilization			86.5%		ICU Level of Service						E	
Analysis Period (min)			15									
c Critical Lane Group												

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	10	507	10	10	502	10	10	21	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	534	11	11	528	11	11	22	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210
pX, platoon unblocked												
vC, conflicting volume	539	539	539	539	539	539	539	539	539	539	539	539
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	539	539	539	539	539	539	539	539	539	539	539	539
tC, single (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
tC, 2 stage (s)												
tF (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
p0 queue free %	99	99	99	99	99	99	99	99	99	99	99	99
cM capacity (veh/h)	1029	1029	1029	1029	1029	1029	1029	1029	1029	1029	1029	1029
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	WB 1	NB 1	SB 1	EB 1	WB 1	NB 1	SB 1
Volume Total	555	549	43	32	555	549	43	32	555	549	43	32
Volume Left	11	11	11	11	11	11	11	11	11	11	11	11
Volume Right	11	11	11	11	11	11	11	11	11	11	11	11
cSH	1029	1025	225	229	1029	1025	225	229	1029	1025	225	229
Volume to Capacity	0.01	0.01	0.19	0.14	0.01	0.01	0.19	0.14	0.01	0.01	0.19	0.14
Queue Length 95th (ft)	1	1	17	12	1	1	17	12	1	1	17	12
Control Delay (s)	0.3	0.3	24.7	23.2	0.3	0.3	24.7	23.2	0.3	0.3	24.7	23.2
Lane LOS	A	A	C	C	A	A	C	C	A	A	C	C
Approach Delay (s)	0.3	0.3	24.7	23.2	0.3	0.3	24.7	23.2	0.3	0.3	24.7	23.2
Approach LOS	C	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
Average Delay	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Intersection Capacity Utilization	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%	42.4%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.99	1.00	1.00	0.85	1.00	0.85	0.95	1.00	0.95
Flt Protected	1.00	1.00	0.95	1.00	1.00	1.00	0.96	1.00	0.98	1.00	1.00	0.98
Satd. Flow (prot)	1856	1583	3433	1837	1837	1837	1782	1583	1750	1750	1750	1750
Flt Permitted	0.97	1.00	0.95	1.00	1.00	1.00	0.72	1.00	0.89	1.00	1.00	0.89
Satd. Flow (perm)	1799	1583	3433	1837	1837	1837	1345	1583	1581	1581	1581	1581
Volume (vph)	10	131	386	846	200	20	311	32	752	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	138	406	891	211	21	327	34	792	11	11	11
RTOR Reduction (vph)	0	0	345	0	4	0	0	0	495	0	7	0
Lane Group Flow (vph)	0	149	61	891	228	0	0	361	297	0	26	0
Turn Type	Perm	Perm	Prot	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	3	8	2	2	6	6	6	6	6	6
Actuated Green, G (s)	12.1	12.1	27.5	44.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Effective Green, g (s)	12.6	12.6	28.0	44.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6
Actuated g/C Ratio	0.15	0.15	0.33	0.53	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	269	237	1142	973	505	594	593	593	593	593	593	593
v/s Ratio Prot	c0.26	0.12										
v/s Ratio Perm	c0.08	0.04										
v/c Ratio	0.55	0.26	0.78	0.23	0.71	0.50	0.04	0.04	0.04	0.04	0.04	0.04
Uniform Delay, d1	33.2	31.7	25.3	10.6	22.5	20.2	16.7	16.7	16.7	16.7	16.7	16.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.6	3.5	0.1	4.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Delay (s)	35.7	32.2	28.8	10.8	27.2	20.9	16.7	16.7	16.7	16.7	16.7	16.7
Level of Service	D	C	C	B	C	C	B	B	B	B	B	B
Approach Delay (s)	33.2			25.1	22.9		16.7	16.7	16.7	16.7	16.7	16.7
Approach LOS	C			C	C		B	B	B	B	B	B
Intersection Summary												
HCM Average Control Delay	25.7			HCM Level of Service	C							
HCM Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	84.2			Sum of lost time (s)	12.0							
Intersection Capacity Utilization	67.3%			ICU Level of Service	C							
Analysis Period (min)	15											
c Critical Lane Group												













4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	10	872	10	10	1036	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	918	11	11	1091	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (ft)	1160			1160								
pX, platoon unblocked	0.42						0.42	0.42		0.42	0.42	0.42
vC, conflicting volume	1101			928			2072	2066	923	2072	2066	1096
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1238			928			3524	3512	923	3524	3512	1226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			0	0	97	0	0	89
cM capacity (veh/h)	239			737			0	2	327	0	2	92
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	928	11	1101	32	32						
Volume Left	11	0	11	0	11	11						
Volume Right	0	11	0	11	11	11						
cSH	239	1700	737	1700	0	0						
Volume to Capacity	0.04	0.55	0.01	0.65	Err	Err						
Queue Length 95th (ft)	3	0	1	0	Err	Err						
Control Delay (s)	20.8	0.0	10.0	0.0	Err	Err						
Lane LOS	C		A		F	F						
Approach Delay (s)	0.2		0.1		Err	Err						
Approach LOS					F	F						
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization	65.1%			ICU Level of Service	C							
Analysis Period (min)	15											













5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0			4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00			1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85			0.99
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00			0.96
Satd. Flow (prot)	1770	1837		1770	1837			1786	1583			1771
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00			0.75
Satd. Flow (perm)	1770	1837		1770	1837			1415	1583			1377
Volume (vph)	60	755	77	116	995	99	35	6	266	112	21	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	795	81	122	1047	104	37	6	280	118	22	15
RTOR Reduction (vph)	0	4	0	0	4	0	0	0	226	0	5	0
Lane Group Flow (vph)	63	872	0	122	1147	0	0	43	54	0	150	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2			
Actuated Green, G (s)	5.3	45.6		7.9	48.2			13.0	13.0		13.0	
Effective Green, g (s)	5.8	46.1		8.4	48.7			13.5	13.5		13.5	
Actuated g/C Ratio	0.07	0.58		0.11	0.61			0.17	0.17		0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	128	1059		186	1118			239	267		232	
v/s Ratio Prot	0.04	0.47		c0.07	c0.62							
v/s Ratio Perm								0.03	0.03		c0.11	
v/c Ratio	0.49	0.82		0.66	1.03			0.18	0.20		0.65	
Uniform Delay, d1	35.7	13.7		34.4	15.6			28.5	28.6		31.0	
Progression Factor	1.00	1.00		1.18	1.29			1.00	1.00		1.01	
Incremental Delay, d2	3.0	7.3		6.7	31.3			0.4	0.4		6.1	
Delay (s)	38.6	20.9		47.3	51.5			28.9	29.0		37.3	
Level of Service	D	C		D	D			C	C		D	
Approach Delay (s)		22.1			51.1			29.0			37.3	
Approach LOS		C			D			C			D	
Intersection Summary												
HCM Average Control Delay		37.5			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		86.5%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95					1.00		1.00
Frt	1.00	1.00	0.85	1.00	0.99					0.91		0.96
Flt Protected	0.95	1.00	1.00	0.95	1.00					0.99		0.97
Satd. Flow (prot)	1770	1863	1583	1770	3499					1682		1732
Flt Permitted	0.95	1.00	1.00	0.95	1.00					0.87		0.39
Satd. Flow (perm)	1770	1863	1583	1770	3499					1487		701
Volume (vph)	52	933	148	187	1083	89	80	45	222	88	13	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	982	156	197	1140	94	84	47	234	93	14	49
RTOR Reduction (vph)	0	0	39	0	4	0	0	40	0	0	10	0
Lane Group Flow (vph)	55	982	117	197	1230	0	0	325	0	0	146	0
Turn Type	Prot			Perm	Prot			Perm		Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases				4								
Actuated Green, G (s)	5.5	96.5	96.5	16.5	107.5			33.5			33.5	
Effective Green, g (s)	6.0	97.0	97.0	17.0	108.0			34.0			34.0	
Actuated g/C Ratio	0.04	0.61	0.61	0.11	0.68			0.21			0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	66	1129	960	188	2362			316			149	
v/s Ratio Prot	0.03	c0.53		c0.11	0.35							
v/s Ratio Perm				0.07				c0.22			0.21	
v/c Ratio	0.83	0.87	0.12	1.05	0.52			1.03			0.98	
Uniform Delay, d1	76.5	26.2	13.4	71.5	13.0			63.0			62.6	
Progression Factor	0.92	1.30	1.80	0.96	0.59			1.00			1.00	
Incremental Delay, d2	41.2	6.2	0.2	69.4	0.6			58.0			66.4	
Delay (s)	112.0	40.3	24.3	138.1	8.2			121.0			129.1	
Level of Service	F	D	C	F	A			F			F	
Approach Delay (s)		41.5			26.1			121.0			129.1	
Approach LOS		D			C			F			F	
Intersection Summary												
HCM Average Control Delay		48.1			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		90.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1734	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1734	
Volume (vph)	105	971	166	181	1043	540	204	155	265	451	131	112
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	1022	175	191	1098	568	215	163	279	475	138	118
RTOR Reduction (vph)	0	0	79	0	0	235	0	0	193	0	19	0
Lane Group Flow (vph)	111	1022	96	191	1098	333	215	163	86	475	237	0
Turn Type	Prot	Perm		Prot	Perm		Prot	Perm		Prot	Prot	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	14.0	87.5	87.5	16.5	90.0	90.0	17.5	13.4	13.4	24.6	20.5	
Effective Green, g (s)	14.5	88.0	88.0	17.0	90.5	90.5	18.0	13.9	13.9	25.1	21.0	
Actuated g/C Ratio	0.09	0.55	0.55	0.11	0.57	0.57	0.11	0.09	0.09	0.16	0.13	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	1946	871	188	2002	895	199	307	138	539	228	
v/s Ratio Prot	0.06	0.29		c0.11	c0.31		c0.12	0.05		0.14	c0.14	
v/s Ratio Perm			0.06			0.21			0.05			
v/c Ratio	0.69	0.53	0.11	1.02	0.55	0.37	1.08	0.53	0.63	0.88	1.04	
Uniform Delay, d1	70.6	22.8	17.2	71.5	21.9	19.1	71.0	69.9	70.5	66.0	69.5	
Progression Factor	1.20	0.76	0.52	1.03	1.05	1.80	1.00	1.00	1.00	1.04	1.04	
Incremental Delay, d2	5.2	0.1	0.0	57.6	0.7	0.8	86.8	1.8	8.5	15.5	70.1	
Delay (s)	89.7	17.5	9.0	131.5	23.7	35.2	157.8	71.7	79.1	84.2	142.5	
Level of Service	F	B	A	F	C	D	F	E	E	F	F	
Approach Delay (s)		22.5			38.3			103.0			104.6	
Approach LOS		C			D			F			F	
Intersection Summary												
HCM Average Control Delay		53.7			HCM Level of Service					D		
HCM Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)					12.0		
Intersection Capacity Utilization		75.2%			ICU Level of Service					D		
Analysis Period (min)		15										
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3528	
Volume (vph)	5	30	140	5	95	95	164	161	5	30	212	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	169	5	32	223	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	1	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	169	3	32	227	0
Turn Type	Prot	Perm		Prot	Prot		Prot	Perm		Prot	Prot	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.0	48.9	48.9	3.3	40.2	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		12.5	49.4	49.4	3.8	40.7	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.16	0.62	0.62	0.05	0.51	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		277	2185	978	84	1795	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.62	0.08	0.00	0.38	0.13	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		31.6	6.1	5.9	37.0	10.3	
Progression Factor	1.00	1.00	1.00	0.86	1.38		0.89	1.12	1.20	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	0.9	0.3		3.7	0.1	0.0	2.9	0.1	
Delay (s)	39.7	32.4	32.1	34.0	45.4		31.7	6.9	7.1	39.8	10.5	
Level of Service	D	C	C	C	D		C	A	A	D	B	
Approach Delay (s)		32.3			45.1			19.3			14.1	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay		25.7			HCM Level of Service					C		
HCM Volume to Capacity ratio		0.25										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)					16.0		
Intersection Capacity Utilization		30.8%			ICU Level of Service					A		
Analysis Period (min)		15										
c Critical Lane Group												













9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↗↗	↕↕					↗	↕↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.90	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3046	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3046	
Volume (vph)	0	941	746	89	1082	0	0	0	0	328	324	677
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	991	785	94	1139	0	0	0	0	345	341	713
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	53	0
Lane Group Flow (vph)	0	991	642	94	1139	0	0	0	0	345	1001	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8						6
Permitted Phases		4						6				
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	990	
v/s Ratio Prot		0.28		0.03		c0.32						
v/s Ratio Perm		c0.41								0.21	0.33	
v/c Ratio		0.60	0.87	0.45	0.56					0.66	1.32dr	
Uniform Delay, d1		16.0	19.3	36.2	10.7					23.2	27.0	
Progression Factor		0.63	0.87	1.05	1.37					1.00	1.00	
Incremental Delay, d2		1.2	10.5	0.7	0.5					6.4	31.5	
Delay (s)		11.4	27.3	38.9	15.2					29.6	58.5	
Level of Service		B	C	D	B					C	E	
Approach Delay (s)		18.4		17.0		0.0		51.3				
Approach LOS		B		B		A		D				
Intersection Summary												
HCM Average Control Delay		28.5		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		86.4%		ICU Level of Service		E						
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Flt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3408		1681	1704	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3408		1681	1704	2787	1770	1814	
Volume (vph)	0	569	701	413	356	117	816	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	599	738	435	375	123	859	114	599	44	43	9
RTOR Reduction (vph)	0	0	284	0	33	0	0	0	442	0	7	0
Lane Group Flow (vph)	0	599	454	435	465	0	474	499	157	44	45	0
Turn Type	Prot	pm+ov		Prot		Split		Perm		Split		
Protected Phases	7	4	2	3	8	2		2	6		6	
Permitted Phases	4											
Actuated Green, G (s)	17.0	37.5	8.5	30.0	20.5		20.5	20.5	16.0	16.0		
Effective Green, g (s)	17.5	38.5	9.0	30.5	21.0		21.0	21.0	16.5	16.5		
Actuated g/C Ratio	0.22	0.48	0.11	0.38	0.26		0.26	0.26	0.21	0.21		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1112	762	386	1299	441		447	732	365	374		
v/s Ratio Prot	0.12	c0.16	c0.13	0.14	0.28		c0.29	c0.02		0.02		
v/s Ratio Perm	0.13											
v/c Ratio	0.54	0.60	1.13	0.36	1.07		1.12	0.21	0.12	0.12		
Uniform Delay, d1	27.7	15.1	35.5	17.7	29.5		29.5	23.1	25.8	25.8		
Progression Factor	1.44	4.09	1.08	1.04	1.04		1.03	2.61	0.86	0.84		
Incremental Delay, d2	1.5	2.7	83.2	0.7	58.8		73.1	0.5	0.7	0.7		
Delay (s)	41.3	64.5	121.6	19.2	89.4		103.5	60.7	23.0	22.4		
Level of Service	D	E	F	B	F		F	E	C	C		
Approach Delay (s)	54.1	66.9			83.0		22.6					
Approach LOS	D	E			F		C					
Intersection Summary												
HCM Average Control Delay	67.9			HCM Level of Service				E				
HCM Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	68.5%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												






















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↖	↗↗	↖↖		↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	981	649	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1033	683	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1033	714	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.9	50.5	36.1		20.5	20.5
Effective Green, g (s)	10.4	51.0	36.6		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	446	2256	1607		465	416
v/s Ratio Prot	0.06	c0.29	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.46	0.46	0.44		0.21	0.16
Uniform Delay, d1	32.2	7.4	14.8		23.0	22.7
Progression Factor	0.90	2.16	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.6	0.9		1.0	0.8
Delay (s)	29.7	16.6	15.7		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)	18.8	15.7			23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		18.5		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.39				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		40.3%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	846	3	40	8	3	5	514	489	2	7	435	706
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	891	3	42	8	3	5	541	515	2	7	458	743
RTOR Reduction (vph)	0	0	31	0	5	0	0	1	0	0	0	210
Lane Group Flow (vph)	446	448	11	0	11	0	541	516	0	7	458	533
Turn Type	Split		Perm	Split			Prot			Prot		pm+ov
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases			4									6
Actuated Green, G (s)	20.5	20.5	20.5		1.5		27.1	38.5		1.5	12.9	33.4
Effective Green, g (s)	21.0	21.0	21.0		2.0		27.6	39.0		2.0	13.4	34.4
Actuated g/C Ratio	0.26	0.26	0.26		0.02		0.35	0.49		0.02	0.17	0.43
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	441	443	416		44		611	1724		44	593	681
v/s Ratio Prot	0.27	c0.27			c0.01		c0.31	0.15		0.00	0.13	c0.21
v/s Ratio Perm			0.01									0.13
v/c Ratio	1.01	1.01	0.03		0.25		0.89	0.30		0.16	0.77	0.78
Uniform Delay, d1	29.5	29.5	21.9		38.3		24.7	12.3		38.2	31.8	19.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.41	1.04	1.03
Incremental Delay, d2	45.7	45.6	0.0		3.0		14.4	0.4		0.9	5.1	3.1
Delay (s)	75.2	75.1	21.9		41.3		39.1	12.7		54.6	38.1	23.2
Level of Service	E	E	C		D		D	B		D	D	C
Approach Delay (s)	72.8				41.3		26.2			29.0		
Approach LOS		E			D			C			C	
Intersection Summary												
HCM Average Control Delay			40.9		HCM Level of Service					D		
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					16.0		
Intersection Capacity Utilization			85.5%		ICU Level of Service					E		
Analysis Period (min)			15									
c Critical Lane Group												














13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	1087	0	0	860
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	1144	0	0	905
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						1034
pX, platoon unblocked	0.81					
vC, conflicting volume	2049	1144			1144	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2291	1144			1144	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	35	243			611	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	1144	905			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.67	0.53			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		60.5%		ICU Level of Service	B	
Analysis Period (min)		15				













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations				 	 		
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	172	89	33	464	489	41	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	181	94	35	488	515	43	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	850	279	558				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	850	279	558				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	37	87	97				
cM capacity (veh/h)	289	718	1009				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	181	94	35	244	244	343	215
Volume Left	181	0	35	0	0	0	0
Volume Right	0	94	0	0	0	0	43
cSH	289	718	1009	1700	1700	1700	1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20	0.13
Queue Length 95th (ft)	97	11	3	0	0	0	0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	B	A				
Approach Delay (s)	27.5		0.6			0.0	
Approach LOS	D						
Intersection Summary							
Average Delay			5.8				
Intersection Capacity Utilization	37.7%		ICU Level of Service			A	
Analysis Period (min)			15				

























16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	424	663	251	334	525
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	446	698	264	352	553
RTOR Reduction (vph)	0	292	0	150	0	0
Lane Group Flow (vph)	271	154	698	114	352	553
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.4	13.4	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.9	13.9	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	391	349	801	681	281	1215
v/s Ratio Prot	c0.15		c0.37		c0.20	
v/s Ratio Perm	0.10		0.07			
v/c Ratio	0.69	0.44	0.87	0.17	1.25	0.46
Uniform Delay, d1	22.6	21.2	16.4	11.0	26.5	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.9	12.5	0.5	139.6	1.2
Delay (s)	27.8	22.1	28.9	11.5	166.1	6.6
Level of Service	C		C		B	
Approach Delay (s)	24.3		24.1		68.7	
Approach LOS	C		C		E	
Intersection Summary						
HCM Average Control Delay			39.8	HCM Level of Service		D
HCM Volume to Capacity ratio			0.90			
Actuated Cycle Length (s)			63.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			77.6%	ICU Level of Service		D
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	722	36	202	713	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	760	38	213	751	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	119	0	63	70	0	59	0
Lane Group Flow (vph)	53	760	9	213	751	43	67	34	15	284	90	0
Turn Type	Prot		Perm		Prot		Perm		Prot		Perm	
Protected Phases	7		4		3		8		5		2	
Permitted Phases			4				8				2	
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.21		0.06	c0.21		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.91	0.02	0.83	0.81	0.10	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	29.8	23.5	36.5	27.6	22.4	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	0.91	0.55	0.22	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	14.3	0.0	14.8	3.9	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	44.1	23.6	48.0	19.0	5.0	36.8	28.5	27.7	23.4	14.2	
Level of Service	D		C		D		B		D		C	
Approach Delay (s)	43.7				22.5				30.4		20.2	
Approach LOS	D				C				C		C	
Intersection Summary												
HCM Average Control Delay			29.6		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			58.2%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	823	146	371	794	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	866	154	391	836	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	255	0	117	227	0	0	206
Lane Group Flow (vph)	245	866	51	391	836	122	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.17		0.11	c0.24		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.88	0.51	0.10	0.76	0.73	0.24	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.6	18.5	32.6	23.9	19.8	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.83	0.48	0.31	0.76	0.69	0.80	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	0.7	0.2	5.1	3.2	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	45.1	11.1	6.0	30.0	19.8	16.7	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	B	B	D	C	C	D	D	C
Approach Delay (s)		17.0			21.5			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		70.0%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.96		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4901		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4901		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1219	389	68	1162	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1283	409	72	1223	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	67	0	0	0	0	0	12	0	0	0	35
Lane Group Flow (vph)	0	1625	0	72	1223	209	0	13	0	370	370	334
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2199		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.33		0.04	c0.35							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.21
v/c Ratio		0.74		0.62	0.61	0.13		0.03		0.84	0.88	0.63
Uniform Delay, d1		18.2		36.4	11.6	0.0		17.8		24.6	25.1	22.4
Progression Factor		0.39		0.78	1.47	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.8		8.4	1.3	0.2		0.0		13.7	18.9	2.4
Delay (s)		8.9		36.9	18.3	0.2		17.9		38.4	44.0	24.9
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		8.9			16.7			17.9			35.8	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		18.5			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		72.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	6408	1583	5085	1583	3433	1504	1504	1748	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.79	0.79	0.79	0.79
Satd. Flow (perm)	1770	6408	1583	5085	1583	2695	1504	1504	1447	1447	1447	1447
Volume (vph)	17	1642	273	0	997	350	428	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1728	287	0	1049	368	451	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	2	0	2	0
Lane Group Flow (vph)	18	1728	287	0	1049	368	451	159	159	0	16	0
Turn Type	Prot	Free	Free	Free	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	7	4	8	8	2	2	6	6	6	6	6	6
Permitted Phases	Free	Free	2	2	6	6	6	6	6	6	6	6
Actuated Green, G (s)	2.2	53.2	80.0	46.5	80.0	17.8	17.8	17.8	17.8	17.8	17.8	17.8
Effective Green, g (s)	2.7	53.7	80.0	47.0	80.0	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Actuated g/C Ratio	0.03	0.67	1.00	0.59	1.00	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	60	4301	1583	2987	1583	616	344	344	331	331	331	331
v/s Ratio Prot	0.01	c0.27	0.18	0.21	0.23	c0.17	0.11	0.11	0.01	0.01	0.01	0.01
v/s Ratio Perm	0.30	0.40	0.18	0.35	0.23	0.73	0.46	0.46	0.05	0.05	0.05	0.05
Uniform Delay, d1	37.7	5.9	0.0	8.6	0.0	28.6	26.6	26.6	24.1	24.1	24.1	24.1
Progression Factor	1.05	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.2	0.2	0.3	0.3	4.5	1.0	1.0	0.1	0.1	0.1	0.1
Delay (s)	41.4	6.1	0.2	8.9	0.3	33.1	27.6	27.6	24.1	24.1	24.1	24.1
Level of Service	D	A	A	A	A	C	C	C	C	C	C	C
Approach Delay (s)	5.5	5.5	5.5	6.7	6.7	30.8	30.8	30.8	24.1	24.1	24.1	24.1
Approach LOS	A	A	A	A	A	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
HCM Volume to Capacity ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Actuated Cycle Length (s)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Intersection Capacity Utilization	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%	49.8%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91	0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949	1610	3329	1583	1610	3390	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949	1610	3329	1583	1610	3390	1583	1583
Volume (vph)	270	1149	545	141	783	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1209	574	148	824	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	72	0	36	0	0	192	0	0	165	0
Lane Group Flow (vph)	284	1209	502	148	967	0	226	475	44	107	242	28
Turn Type	Prot	pm+ov	Prot	Split	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Protected Phases	7	4	2	3	8	2	2	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	10.8	32.6	48.2	7.5	29.3	15.6	15.6	15.6	11.7	11.7	11.7	11.7
Effective Green, g (s)	11.3	33.1	49.2	8.0	29.8	16.1	16.1	16.1	12.2	12.2	12.2	12.2
Actuated g/C Ratio	0.13	0.39	0.58	0.09	0.35	0.19	0.19	0.19	0.14	0.14	0.14	0.14
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	454	1372	986	166	1727	304	628	298	230	484	226	226
v/s Ratio Prot	0.08	c0.34	0.10	c0.08	0.20	0.14	c0.14	0.07	c0.07	0.07	c0.07	0.07
v/s Ratio Perm	0.63	0.88	0.51	0.89	0.56	0.74	0.76	0.15	0.47	0.50	0.12	0.12
Uniform Delay, d1	35.0	24.3	10.9	38.3	22.5	32.7	32.8	28.9	33.6	33.8	31.9	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	8.4	0.4	40.3	1.3	9.5	5.2	0.2	1.5	0.8	0.2	0.2
Delay (s)	37.7	32.7	11.3	78.5	23.8	42.2	38.0	29.2	35.1	34.6	32.2	32.2
Level of Service	D	C	B	E	C	D	D	C	D	C	C	C
Approach Delay (s)	27.5	27.5	27.5	30.8	30.8	36.8	36.8	33.8	33.8	33.8	33.8	33.8
Approach LOS	C	C	C	C	C	D	D	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9
HCM Volume to Capacity ratio	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Actuated Cycle Length (s)	85.4	85.4	85.4	85.4	85.4	85.4	85.4	85.4	85.4	85.4	85.4	85.4
Intersection Capacity Utilization	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%	71.9%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	→	↗	↖	←	↖	↖	↑	↗	↗	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	220	321	494	108	200	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	232	338	520	114	211	360	231
RTOR Reduction (vph)	0	67	0	0	177	0	0	75	0	0	174	0
Lane Group Flow (vph)	140	655	0	135	620	55	338	520	39	211	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		c0.12	0.19	
v/s Ratio Perm					0.03			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.15	0.94	0.81	0.07	1.18	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	21.0	27.3	20.5	15.2	31.1	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.2	33.1	10.4	0.3	123.6	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	21.2	60.4	30.9	15.4	154.8	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	F	D	C
Approach Delay (s)		39.7			32.5			39.4			63.6	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM Average Control Delay		43.0			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		69.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		77.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	→	↗	↖	←	↖	↖	↑	↗	↗	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.89	1.00	1.00	0.89
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3517		1770	3539	1583	1770	1660	1583	1770	1660	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3517		1770	3539	1583	1770	1660	1583	1770	1660	1583
Volume (vph)	102	729	32	53	855	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	767	34	56	900	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	119	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	798	0	56	900	232	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8							6
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.23		0.03	c0.25		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.15							
v/c Ratio	0.67	0.71		0.58	0.89	0.51	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.9		41.6	30.9	27.0	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.63	0.55	0.19	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.8		7.8	10.9	3.7	22.4	1.0		5.7	0.1	
Delay (s)	50.4	30.7		34.2	27.8	8.8	64.9	40.2		30.6	16.7	
Level of Service	D	C		C	C	A	E	D		C	B	
Approach Delay (s)		33.0			23.0			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		28.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		74.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑					↑↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	465	99	1017	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	489	104	1071	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	123	0	0	0	0	0	0	0	66	0
Lane Group Flow (vph)	0	862	366	104	1071	0	0	0	0	673	157	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06		c0.30				c0.20	0.10	
v/s Ratio Perm		0.23										
v/c Ratio		0.59	0.56	0.44	0.51					0.61	0.31	
Uniform Delay, d1		20.7	20.4	35.8	10.9					25.7	22.9	
Progression Factor		0.51	0.46	1.30	1.77					1.00	1.00	
Incremental Delay, d2		1.3	2.5	1.2	0.8					1.0	1.6	
Delay (s)		11.8	12.0	47.7	20.2					26.7	24.5	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		11.9		22.6		0.0				26.1		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		19.3		HCM Level of Service		B						
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		62.5%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	468	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	493	248
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	1538	0	0	649	493	228
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	62.0			62.0	19.0	19.0
Effective Green, g (s)	62.5			62.5	19.5	19.5
Actuated g/C Ratio	0.69			0.69	0.22	0.22
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2458			2458	744	343
v/s Ratio Prot	c0.43			0.18	0.14	
v/s Ratio Perm				c0.14		
v/c Ratio	0.63			0.26	0.66	0.66
Uniform Delay, d1	7.4			5.1	32.2	32.2
Progression Factor	0.36			1.00	1.00	1.00
Incremental Delay, d2	1.0			0.3	2.2	4.8
Delay (s)	3.6			5.4	34.5	37.0
Level of Service	A			A	C	D
Approach Delay (s)	3.6			5.4	35.3	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			12.1	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			62.5%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

26: Redwood Drive & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor		1.00			1.00	1.00		0.95	1.00		1.00	0.95
Flt		0.94			1.00	0.85		1.00	0.85		1.00	1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1718			1842	1583		1770	3539		1770	3536
Flt Permitted		0.92			0.94	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1601			1747	1583		1770	3539		1770	3536
Volume (vph)	7	6	11	2	7	226	19	790	20	116	667	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	6	12	2	7	238	20	832	21	122	702	4
RTOR Reduction (vph)	0	10	0	0	0	205	0	0	10	0	0	0
Lane Group Flow (vph)	0	15	0	0	9	33	20	832	11	122	706	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		6.3			6.3	6.3	0.9	24.6	24.6	4.7	28.4	
Effective Green, g (s)		6.8			6.8	6.8	1.4	25.1	25.1	5.2	28.9	
Actuated g/C Ratio		0.14			0.14	0.14	0.03	0.51	0.51	0.11	0.59	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		222			242	219	50	1809	809	187	2081	
v/s Ratio Prot							0.01	c0.24		c0.07	c0.20	
v/s Ratio Perm		0.01			0.01	c0.02			0.01			
v/c Ratio		0.07			0.04	0.15	0.40	0.46	0.01	0.65	0.34	
Uniform Delay, d1		18.4			18.3	18.6	23.4	7.7	5.9	21.1	5.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.1	0.3	5.2	0.2	0.0	7.9	0.1	
Delay (s)		18.5			18.4	18.9	28.6	7.9	5.9	29.0	5.3	
Level of Service		B			B	B	C	A	A	C	A	
Approach Delay (s)		18.5			18.9			8.3			8.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay		10.0										
HCM Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		49.1										
Intersection Capacity Utilization		49.2%										
Analysis Period (min)		15										
c Critical Lane Group												

27: Redwood Drive & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	221	2	11	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	233	2	12	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	235			149			393	393	148	393	394	234
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235			149			393	393	148	393	394	234
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1333			1432			564	541	899	564	541	805
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	239	13	1								
Volume Left	1	4	12	0								
Volume Right	3	2	1	0								
cSH	1333	1432	582	541								
Volume to Capacity	0.00	0.00	0.02	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	11.3	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.3	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay		0.5										
Intersection Capacity Utilization		28.4%										
Analysis Period (min)		15										
ICU Level of Service A												

28: Redwood Drive & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	23	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	24	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	34	5								
Volume Left	1	4	24	4								
Volume Right	2	8	0	1								
cSH	1341	1454	580	614								
Volume to Capacity	0.00	0.00	0.06	0.01								
Queue Length 95th (ft)	0	0	5	1								
Control Delay (s)	0.1	0.2	11.6	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.6	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			24.0%		ICU Level of Service			A				
Analysis Period (min)			15									

29: Redwood Drive & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			27.4%		ICU Level of Service	A
Analysis Period (min)			15			

30: Redwood Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			32.1%		ICU Level of Service		A					
Analysis Period (min)			15									

31: Redwood Drive & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			22.4%		ICU Level of Service	A
Analysis Period (min)			15			

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	23	363	181	13	798	334	206	544
v/c Ratio	0.05	0.95	0.36	0.12	0.95	0.37	0.92	0.49
Control Delay	14.2	67.0	18.1	44.4	46.5	3.1	85.0	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	67.0	18.1	44.4	46.5	3.1	85.0	12.7
Queue Length 50th (ft)	3	201	50	7	417	0	118	150
Queue Length 95th (ft)	21	#373	106	26	#668	45	#253	302
Internal Link Dist (ft)	885	1130			954			1280
Turn Bay Length (ft)			35	150			150	
Base Capacity (vph)	510	393	513	111	857	908	223	1114
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.92	0.35	0.12	0.93	0.37	0.92	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↑	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	149	406	891	232	361	792	33
v/c Ratio	0.56	0.70	0.78	0.24	0.72	0.73	0.06
Control Delay	44.1	11.2	30.8	10.4	35.5	6.6	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	11.2	30.8	10.4	35.5	6.6	16.7
Queue Length 50th (ft)	75	0	219	60	164	0	7
Queue Length 95th (ft)	151	88	304	97	#377	106	32
Internal Link Dist (ft)	2170			1080	1484		2210
Turn Bay Length (ft)							
Base Capacity (vph)	350	634	1768	1238	514	1094	567
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.64	0.50	0.19	0.70	0.72	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↗	→	↘	←	↑	↙	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	63	876	122	1151	43	280	155
v/c Ratio	0.41	0.82	0.65	1.01	0.18	0.57	0.65
Control Delay	43.5	22.6	56.9	48.2	28.6	9.2	42.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.2	0.5
Total Delay	43.5	22.7	56.9	48.2	28.6	9.3	43.3
Queue Length 50th (ft)	30	333	60	~958	18	3	71
Queue Length 95th (ft)	#71	#595 m#178	m#164	3	44	64	106
Internal Link Dist (ft)		1080		1070	911		2200
Turn Bay Length (ft)							
Base Capacity (vph)	153	1063	187	1144	304	551	297
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	11	0	0	0	27	21
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.83	0.65	1.01	0.14	0.53	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↗	→	↘	←	↑	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	55	982	156	197	1234	365	156
v/c Ratio	0.83	0.87	0.16	1.05	0.52	1.03	0.98
Control Delay	121.1	41.3	9.4	133.2	8.2	106.0	122.6
Queue Delay	0.0	10.4	0.0	0.0	0.2	0.0	0.0
Total Delay	121.1	51.7	9.4	133.2	8.4	106.0	122.6
Queue Length 50th (ft)	59	1031	40	~226	208	~361	153
Queue Length 95th (ft)	m#89	1216	m#63	m#355	m#219	#576	#312
Internal Link Dist (ft)		1070			550	687	2220
Turn Bay Length (ft)							
Base Capacity (vph)	66	1129	999	188	2366	356	159
Starvation Cap Reductn	0	137	0	0	329	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.99	0.16	1.05	0.61	1.03	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	1022	175	191	1098	568	215	163	279	475	256
v/c Ratio	0.69	0.53	0.18	1.02	0.55	0.50	1.08	0.53	0.85	0.88	1.04
Control Delay	93.8	18.0	1.3	127.8	24.3	4.4	150.4	75.8	41.1	86.2	128.7
Queue Delay	0.0	1.0	0.0	14.0	6.8	1.2	0.0	0.0	2.6	0.0	0.0
Total Delay	93.8	19.0	1.3	141.9	31.1	5.6	150.4	75.8	43.7	86.2	128.7
Queue Length 50th (ft)	109	317	7	~212	386	69	~250	87	69	261	~268
Queue Length 95th (ft)	m123	m315	m7	m#319	m418	m76	#426	127	#202	#384	#455
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)							150		100		275
Base Capacity (vph)	188	1946	949	188	2002	1130	199	376	357	538	247
Starvation Cap Reductn	0	608	0	8	850	334	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	25	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.76	0.18	1.06	0.95	0.71	1.08	0.43	0.84	0.88	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	169	5	32	228
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.62	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	29.6	25.1	36.1	6.8	7.0	35.8	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	29.6	25.1	36.1	6.8	7.0	35.8	11.1
Queue Length 50th (ft)	2	15	0	2	30	90	6	0	15	23
Queue Length 95th (ft)	13	39	49	m4	m47	123	49	m2	40	67
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	400	2462	1103	184	1954
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	991	785	94	1139	345	1054
v/c Ratio	0.59	0.88	0.37	0.56	0.66	1.32dr
Control Delay	11.2	21.3	39.1	15.3	30.4	57.2
Queue Delay	0.8	1.8	0.0	0.2	0.0	81.3
Total Delay	12.0	23.1	39.1	15.5	30.4	138.5
Queue Length 50th (ft)	225	390	19	197	161	~275
Queue Length 95th (ft)	239	m#495	m21	m155	261	#422
Internal Link Dist (ft)	220		466			348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1043
Starvation Cap Reductn	372	35	0	0	0	0
Spillback Cap Reductn	0	0	0	273	0	174
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.92	0.37	0.65	0.66	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	599	738	435	498	474	499	599	44	52
v/c Ratio	0.54	0.71	1.13	0.37	1.07	1.12	0.51	0.12	0.14
Control Delay	41.4	11.1	120.6	17.4	90.9	104.4	7.3	23.2	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	11.1	120.6	17.4	90.9	104.4	7.3	23.2	19.0
Queue Length 50th (ft)	125	263	~137	112	~266	~289	30	22	23
Queue Length 95th (ft)	133	302	#229	151	m#343	m#367	m27	42	43
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1112	1046	386	1333	441	447	1173	365	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.71	1.13	0.37	1.07	1.12	0.51	0.12	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	WBT	SBL	SBR
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1033	718	97	248
v/c Ratio	0.46	0.46	0.45	0.21	0.41
Control Delay	31.6	16.7	16.1	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	31.6	17.3	16.1	24.5	5.8
Queue Length 50th (ft)	57	219	122	38	0
Queue Length 95th (ft)	76	227	177	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1610	465	598
Starvation Cap Reductn	0	741	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.68	0.45	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	446	448	42	16	541	517	7	458	743
v/c Ratio	1.01	1.01	0.09	0.11	1.02	0.25	0.05	0.50	0.71
Control Delay	77.8	77.8	8.3	29.3	74.3	10.7	47.3	29.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Total Delay	77.8	77.8	8.3	29.3	74.3	10.7	47.3	29.1	9.2
Queue Length 50th (ft)	~238	~241	0	5	~278	51	4	118	169
Queue Length 95th (ft)	#433	#436	23	23	#478	147	m4	m#158	m236
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2044	177	912	1049
Starvation Cap Reductn	0	0	0	0	0	0	0	0	120
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.01	0.09	0.09	1.02	0.25	0.04	0.50	0.80
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	446	698	264	352	553
v/c Ratio	0.69	0.70	0.87	0.32	1.25	0.46
Control Delay	32.6	11.2	32.0	3.1	167.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	11.2	32.0	3.1	167.8	7.4
Queue Length 50th (ft)	96	22	248	0	~183	99
Queue Length 95th (ft)	168	104	#451	38	#329	160
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	672	800	830	281	1215
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.66	0.87	0.32	1.25	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	760	38	213	751	162	67	97	85	284	149
v/c Ratio	0.40	1.01	0.10	0.83	0.81	0.30	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	68.8	9.9	55.2	24.8	2.2	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	68.8	9.9	55.2	24.8	2.2	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	~204	0	40	160	0	16	8	0	118	13
Queue Length 95th (ft)	61	#323	23	m#90	#301	m3	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	535	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.01	0.10	0.83	0.81	0.30	0.26	0.25	0.22	0.53	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	866	154	391	836	377	144	435	274	383	278	256
v/c Ratio	0.88	0.51	0.25	0.76	0.73	0.49	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	50.8	11.2	1.8	34.0	20.3	3.9	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	11.2	1.8	34.0	20.3	3.9	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	78	58	3	104	220	30	71	74	0	95	129	0
Queue Length 95th (ft) m#107	m60	m4	#162	236	41	#157	118	65	#188	#230	58	
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1144	767	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.51	0.25	0.76	0.73	0.49	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1692	72	1223	209	25	370	370	369
v/c Ratio	0.73	0.51	0.61	0.13	0.05	0.84	0.88	0.65
Control Delay	8.5	40.5	19.5	0.2	9.8	43.2	48.5	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	40.5	19.5	0.2	9.8	43.2	48.5	24.9
Queue Length 50th (ft)	130	37	276	0	2	169	172	127
Queue Length 95th (ft)	166	m#57	399	m0	18	#318	#329	217
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2322	142	2000	1583	568	475	455	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.51	0.61	0.13	0.04	0.78	0.81	0.61

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1728	287	1049	368	451	161	161	18
v/c Ratio	0.14	0.40	0.18	0.33	0.23	0.73	0.47	0.47	0.05
Control Delay	38.2	6.6	0.2	9.2	0.3	35.4	29.7	29.7	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	6.6	0.2	9.2	0.3	35.4	29.7	29.7	19.2
Queue Length 50th (ft)	10	137	0	67	0	108	72	72	6
Queue Length 95th (ft)	m13	m193	m0	157	0	141	117	117	20
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	4301	1583	3159	1583	1415	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	127	0	0	0	0	25	25	25
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.41	0.18	0.33	0.23	0.32	0.21	0.21	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↗	→	↘	↖	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1209	574	148	1003	226	475	236	107	242	193
v/c Ratio	0.63	0.88	0.55	0.89	0.57	0.74	0.76	0.48	0.47	0.50	0.49
Control Delay	42.3	34.4	8.8	88.1	23.4	49.9	42.1	8.2	40.4	37.4	9.8
Queue Delay	0.0	5.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	39.4	9.9	88.1	23.4	49.9	42.1	8.2	40.4	37.4	9.8
Queue Length 50th (ft)	74	311	103	80	150	126	132	0	59	67	0
Queue Length 95th (ft)	121	#481	214	#202	209	#258	#214	61	113	104	56
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	478	1369	1038	166	1763	310	641	495	296	624	449
Starvation Cap Reductn	0	116	237	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.96	0.72	0.89	0.57	0.73	0.74	0.48	0.36	0.39	0.43
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	232	338	520	114	211	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.42	0.95	0.81	0.18	1.18	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	157.7	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.1	66.8	32.8	4.5	157.7	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	~112	146	0
Queue Length 95th (ft)	#162	#221	#155	184	50	#296	#358	30	#234	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	560	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.41	0.95	0.81	0.18	1.18	0.79	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT		
Lane Group Flow (vph)	107	801	56	900	351	51	91	511	132		
v/c Ratio	0.67	0.65	0.47	0.84	0.59	0.43	0.44	0.80	0.18		
Control Delay	64.2	31.0	37.8	26.5	6.7	52.2	21.8	35.9	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.2	31.0	37.8	26.5	6.7	52.2	21.8	35.9	5.8		
Queue Length 50th (ft)	61	224	31	274	4	28	14	237	10		
Queue Length 95th (ft)	#161	#336	m56	#384	21	65	57	#388	43		
Internal Link Dist (ft)		6630		350			200		236		
Turn Bay Length (ft)	225		150		80	50		225			
Base Capacity (vph)	159	1234	118	1077	598	118	367	653	782		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	6	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.67	0.65	0.47	0.84	0.59	0.43	0.25	0.78	0.17		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	489	104	1071	673	223
v/c Ratio	0.58	0.62	0.39	0.51	0.61	0.39
Control Delay	12.2	8.6	48.3	20.5	28.6	15.2
Queue Delay	0.2	0.5	0.0	0.4	0.0	0.0
Total Delay	12.4	9.1	48.3	20.9	28.6	15.2
Queue Length 50th (ft)	118	69	58	264	164	52
Queue Length 95th (ft)	146	m110	m101	327	222	113
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	785	295	2084	1106	577
Starvation Cap Reductn	142	70	0	487	0	0
Spillback Cap Reductn	11	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.68	0.35	0.67	0.61	0.39
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	493	248
v/c Ratio	0.63	0.26	0.66	0.68
Control Delay	4.1	6.2	36.0	37.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.1	6.2	36.0	37.9
Queue Length 50th (ft)	0	59	135	119
Queue Length 95th (ft)	246	115	162	176
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2456	2456	1221	580
Starvation Cap Reductn	64	0	0	0
Spillback Cap Reductn	0	8	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.40	0.43
Intersection Summary				

26: Redwood Drive & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative C (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	9	238	20	832	21	122	706
v/c Ratio	0.09	0.03	0.51	0.10	0.44	0.02	0.42	0.30
Control Delay	13.6	17.2	7.5	23.9	10.5	5.2	22.6	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	17.2	7.5	23.9	10.5	5.2	22.6	5.6
Queue Length 50th (ft)	3	2	0	4	83	0	26	26
Queue Length 95th (ft)	19	12	46	22	157	10	78	115
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	530	567	660	206	2044	923	324	2428
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.36	0.10	0.41	0.02	0.38	0.29
Intersection Summary								

**CUMULATIVE 2020 + ALTERNATIVE C
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.93	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1725	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1861
Flt Permitted	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1725	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1861
Volume (vph)	0	13	16	369	22	209	14	677	329	223	508	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	14	17	388	23	220	15	713	346	235	535	3
RTOR Reduction (vph)	0	16	0	0	0	151	0	0	145	0	0	0
Lane Group Flow (vph)	0	15	0	388	23	69	15	713	201	235	538	0
Turn Type	Perm			Prot		Perm	Prot		Perm	Prot		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4				8			2				
Actuated Green, G (s)		4.3		25.6	34.4	34.4	2.1	47.5	47.5	15.5	60.9	
Effective Green, g (s)		4.8		26.1	34.9	34.9	2.6	48.0	48.0	16.0	61.4	
Actuated g/C Ratio		0.04		0.24	0.31	0.31	0.02	0.43	0.43	0.14	0.55	
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		75		417	586	498	41	806	685	255	1030	
v/s Ratio Prot		0.01		c0.22	0.01		0.01	c0.38		c0.13	0.29	
v/s Ratio Perm					c0.04			0.13				
v/c Ratio		0.20		0.93	0.04	0.14	0.37	0.88	0.29	0.92	0.52	
Uniform Delay, d1		51.2		41.5	26.4	27.2	53.3	28.9	20.4	46.8	15.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.3		27.4	0.0	0.1	5.5	11.4	0.2	35.9	0.5	
Delay (s)		52.5		68.9	26.4	27.4	58.8	40.3	20.7	82.7	16.0	
Level of Service		D		E	C	C	E	D	C	F	B	
Approach Delay (s)		52.5			52.9			34.2			36.3	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM Average Control Delay		39.8										
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		110.9										
Intersection Capacity Utilization		85.1%										
Analysis Period (min)		15										
c Critical Lane Group												

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	546	10	9	581	9	10	21	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	575	11	9	612	9	11	22	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1210										
pX, platoon unblocked												
vC, conflicting volume	621			585			1252	1241	580	1258	1242	616
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621			585			1252	1241	580	1258	1242	616
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	87	98	92	94	98
cM capacity (veh/h)	960			989			137	171	514	128	171	490
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	596	631	43	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	960	989	191	191								
Volume to Capacity	0.01	0.01	0.23	0.16								
Queue Length 95th (ft)	1	1	21	14								
Control Delay (s)	0.3	0.3	29.3	27.5								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.3	0.3	29.3	27.5								
Approach LOS		D	D									
Intersection Summary												
Average Delay		1.9										
Intersection Capacity Utilization		45.9%										
Analysis Period (min)		15										
ICU Level of Service A												

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	0.97	1.00				1.00	1.00			1.00
Frt	1.00	0.85	1.00	1.00				1.00	0.85			0.95
Flt Protected	1.00	1.00	0.95	1.00				0.96	1.00			0.98
Satd. Flow (prot)	1857	1583	3433	1854				1782	1583			1750
Flt Permitted	0.97	1.00	0.95	1.00				0.72	1.00			0.89
Satd. Flow (perm)	1806	1583	3433	1854				1345	1583			1580
Volume (vph)	10	170	386	845	280	9	311	32	752	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	179	406	889	295	9	327	34	792	11	11	11
RTOR Reduction (vph)	0	0	340	0	1	0	0	0	501	0	7	0
Lane Group Flow (vph)	0	190	66	889	303	0	0	361	291	0	26	0
Turn Type	Perm	Perm	Prot			Perm		Perm	Perm			
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4				2		2	6		
Actuated Green, G (s)		13.5	13.5	28.0	46.0			31.1	31.1		31.1	
Effective Green, g (s)		14.0	14.0	28.5	46.5			31.6	31.6		31.6	
Actuated g/C Ratio		0.16	0.16	0.33	0.54			0.37	0.37		0.37	
Clearance Time (s)		4.5	4.5	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		294	257	1136	1001			494	581		580	
v/s Ratio Prot				c0.26	0.16							
v/s Ratio Perm		c0.11	0.04					c0.27	0.18		0.02	
v/c Ratio		0.65	0.26	0.78	0.30			0.73	0.50		0.04	
Uniform Delay, d1		33.7	31.5	26.0	10.9			23.6	21.1		17.5	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		4.8	0.5	3.6	0.2			5.5	0.7		0.0	
Delay (s)		38.6	32.0	29.6	11.1			29.1	21.8		17.6	
Level of Service		D	C	C	B			C	C		B	
Approach Delay (s)		34.1			24.9			24.1			17.6	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay		26.3				HCM Level of Service		C				
HCM Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		86.1				Sum of lost time (s)		12.0				
Intersection Capacity Utilization		69.4%				ICU Level of Service		C				
Analysis Period (min)		15										
c Critical Lane Group												













4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	912	10	9	1116	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	960	11	9	1175	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1160			1160							
pX, platoon unblocked	0.48			0.97			0.49	0.49	0.97	0.49	0.49	0.48
vC, conflicting volume	1184			971			2196	2189	965	2191	2185	1175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1387			969			3317	3304	964	3307	3296	1367
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			0	0	96	0	0	88
cM capacity (veh/h)	235			686			0	4	299	0	4	86
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1					
Volume Total	11	971	9	1175	9	32	32					
Volume Left	11	0	9	0	0	11	11					
Volume Right	0	11	0	0	9	11	11					
cSH	235	1700	686	1700	1700	0	0					
Volume to Capacity	0.04	0.57	0.01	0.69	0.01	Err	Err					
Queue Length 95th (ft)	3	0	1	0	0	Err	Err					
Control Delay (s)	21.0	0.0	10.3	0.0	0.0	Err	Err					
Lane LOS	C		B			F	F					
Approach Delay (s)	0.2		0.1			Err	Err					
Approach LOS						F	F					
Intersection Summary												
Average Delay						Err						
Intersection Capacity Utilization		68.7%				ICU Level of Service		C				
Analysis Period (min)		15										













5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98			1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3515		1770	3460			1795	1583	1770	1788	
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3515		1770	3460			1413	1583	1770	1788	
Volume (vph)	40	851	41	188	1081	189	44	14	396	180	31	11
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	896	43	198	1138	199	46	15	417	189	33	12
RTOR Reduction (vph)	0	3	0	0	11	0	0	0	299	0	8	0
Lane Group Flow (vph)	42	936	0	198	1326	0	0	61	118	189	37	0
Turn Type	Prot			Prot			Perm		Perm	Prot		
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2			
Actuated Green, G (s)	3.9	44.8		18.3	59.2			13.0	13.0	15.9	33.4	
Effective Green, g (s)	4.4	45.3		18.8	59.7			13.5	13.5	16.4	33.9	
Actuated g/C Ratio	0.04	0.41		0.17	0.54			0.12	0.12	0.15	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	71	1448		303	1878			173	194	264	551	
v/s Ratio Prot	0.02	c0.27		0.11	c0.38					c0.11	0.02	
v/s Ratio Perm								0.04	c0.07			
v/c Ratio	0.59	0.65		0.65	0.71			0.35	0.61	0.72	0.07	
Uniform Delay, d1	51.9	25.9		42.6	18.6			44.2	45.7	44.6	26.9	
Progression Factor	1.00	1.00		0.72	0.61			1.00	1.00	1.02	1.03	
Incremental Delay, d2	12.5	2.2		2.8	1.3			1.2	5.3	8.9	0.1	
Delay (s)	64.4	28.2		33.6	12.6			45.5	51.0	54.3	27.7	
Level of Service	E	C		C	B			D	D	D	C	
Approach Delay (s)		29.7			15.3			50.3			49.2	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM Average Control Delay		27.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		69.3%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

























6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95			1.00	0.95	0.95	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.91	0.85	1.00	0.89
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3441			1770	1617	1504	1770	1655
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3441			1770	1617	1504	1770	1655
Volume (vph)	53	1101	273	509	1196	273	143	105	559	217	41	119
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	1159	287	536	1259	287	151	111	588	228	43	125
RTOR Reduction (vph)	0	0	172	0	17	0	0	45	38	0	96	0
Lane Group Flow (vph)	56	1159	115	536	1529	0	151	217	399	228	72	0
Turn Type	Prot			Perm	Prot		Prot		pm+ov	Prot		
Protected Phases	7	4			3		5		2	3	1	6
Permitted Phases				4						2		
Actuated Green, G (s)	4.4	39.6	39.6	19.4	54.6		16.5	17.1	36.5	15.9	16.5	
Effective Green, g (s)	4.9	40.1	40.1	19.9	55.1		17.0	17.6	37.5	16.4	17.0	
Actuated g/C Ratio	0.04	0.36	0.36	0.18	0.50		0.15	0.16	0.34	0.15	0.15	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	79	1290	577	621	1724		274	259	513	264	256	
v/s Ratio Prot	0.03	0.33		c0.16	c0.44		0.09	c0.13	0.14	c0.13	0.04	
v/s Ratio Perm				0.07					0.12			
v/c Ratio	0.71	0.90	0.20	0.86	0.89		0.55	0.84	0.78	0.86	0.28	
Uniform Delay, d1	51.8	33.0	24.0	43.7	24.6		43.0	44.8	32.5	45.7	41.1	
Progression Factor	0.77	0.69	0.77	0.93	0.81		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.5	7.5	0.5	5.7	3.4		2.4	26.6	7.3	24.1	2.8	
Delay (s)	58.4	30.4	19.1	46.4	23.4		45.4	71.4	39.9	69.8	43.9	
Level of Service	E	C	B	D	C		D	E	D	E	D	
Approach Delay (s)		29.3			29.4			50.6			58.8	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		35.5			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		87.4%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												




















7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	0.91	0.91	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	3539	1583	1610	3271	1583	3433	1648	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	3539	1583	1610	3271	1583	3433	1648	
Volume (vph)	157	1465	255	73	1188	730	556	103	350	453	70	234
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	165	1542	268	77	1251	768	585	108	368	477	74	246
RTOR Reduction (vph)	0	0	72	0	0	402	0	0	75	0	109	0
Lane Group Flow (vph)	165	1542	196	77	1251	366	293	400	293	477	211	0
Turn Type	Prot	Perm		Prot	Perm		Split	Perm		Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	13.9	50.5	50.5	5.0	41.6	41.6	20.5	20.5	20.5	16.0	16.0	
Effective Green, g (s)	14.4	51.0	51.0	5.5	42.1	42.1	21.0	21.0	21.0	16.5	16.5	
Actuated g/C Ratio	0.13	0.46	0.46	0.05	0.38	0.38	0.19	0.19	0.19	0.15	0.15	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	232	1572	668	89	1354	606	307	624	302	515	247	
v/s Ratio Prot	c0.09	c0.45		0.04	0.35		0.18	0.12		c0.14	0.13	
v/s Ratio Perm			0.14			0.23			c0.18			
v/c Ratio	0.71	0.98	0.29	0.87	0.92	0.60	0.95	0.91	0.97	0.93	0.86	
Uniform Delay, d1	45.8	29.0	18.3	51.9	32.4	27.2	44.0	41.0	44.2	46.1	45.6	
Progression Factor	1.16	0.58	0.42	1.11	0.62	0.68	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.9	11.9	0.5	38.3	8.1	2.8	39.0	2.3	42.9	22.7	23.9	
Delay (s)	57.8	28.6	8.2	95.7	28.3	21.2	83.0	43.3	87.1	68.9	69.5	
Level of Service	E	C	A	F	C	C	F	D	F	E	E	
Approach Delay (s)		28.3			28.2			69.4			69.1	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM Average Control Delay		41.1		HCM Level of Service					D			
HCM Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		110.0		Sum of lost time (s)					16.0			
Intersection Capacity Utilization		94.1%		ICU Level of Service					F			
Analysis Period (min)		15										
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.89	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3030	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3030	
Volume (vph)	0	1461	810	77	1288	0	0	0	0	355	288	700
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1538	853	81	1356	0	0	0	0	374	303	737
RTOR Reduction (vph)	0	0	162	0	0	0	0	0	0	0	31	0
Lane Group Flow (vph)	0	1538	691	81	1356	0	0	0	0	374	1009	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3		8					6	
Permitted Phases				4								
Actuated Green, G (s)		54.6	54.6	4.4	63.5					37.5	37.5	
Effective Green, g (s)		55.1	55.1	4.9	64.0					38.0	38.0	
Actuated g/C Ratio		0.50	0.50	0.04	0.58					0.35	0.35	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1773	793	153	2059					556	1047	
v/s Ratio Prot		0.43		0.02	0.38							
v/s Ratio Perm			0.44							0.23	0.33	
v/c Ratio		0.87	0.87	0.53	0.66					0.67	1.34	dr
Uniform Delay, d1		24.2	24.3	51.4	15.6					30.7	35.3	
Progression Factor		0.63	0.45	1.23	1.62					1.00	1.00	
Incremental Delay, d2		1.9	4.1	2.4	1.2					6.4	20.3	
Delay (s)		17.2	15.1	65.7	26.4					37.1	55.6	
Level of Service		B	B	E	C					D	E	
Approach Delay (s)		16.4			28.6			0.0			50.7	
Approach LOS		B			C			A			D	
Intersection Summary												
HCM Average Control Delay		29.0		HCM Level of Service					C			
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		110.0		Sum of lost time (s)					8.0			
Intersection Capacity Utilization		90.7%		ICU Level of Service					E			
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												













10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	0.88	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)		5085	2787	3433	3520		1681	1688	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)		5085	2787	3433	3520		1681	1688	2787	1770	1723	
Volume (vph)	0	770	1048	499	455	17	913	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	811	1103	525	479	18	961	19	601	9	9	9
RTOR Reduction (vph)	0	0	394	0	2	0	0	0	399	0	8	0
Lane Group Flow (vph)	0	811	709	525	495	0	481	499	202	9	10	0
Turn Type	Prot	pm+ov		Prot	Split		Perm		Split			
Protected Phases	7	4	2	3	8	2		2	6		6	
Permitted Phases	4											
Actuated Green, G (s)	21.0	57.5	18.5	44.0	36.5		36.5	36.5	16.0	16.0		
Effective Green, g (s)	21.5	58.5	19.0	44.5	37.0		37.0	37.0	16.5	16.5		
Actuated g/C Ratio	0.20	0.53	0.17	0.40	0.34		0.34	0.34	0.15	0.15		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	994	1482	593	1424	565		568	937	266	258		
v/s Ratio Prot	c0.16	0.16	c0.15	0.14	0.29		c0.30		0.01	c0.01		
v/s Ratio Perm	0.09											
v/c Ratio	0.82	0.48	0.89	0.35	0.85		0.88	0.22	0.03	0.04		
Uniform Delay, d1	42.4	16.2	44.4	22.7	33.9		34.4	26.1	39.9	40.0		
Progression Factor	0.97	2.26	0.86	0.59	1.40		1.40	7.44	1.00	1.00		
Incremental Delay, d2	4.2	0.6	12.5	0.6	11.8		13.9	0.4	0.2	0.3		
Delay (s)	45.4	37.2	50.6	13.9	59.5		62.2	194.7	40.2	40.3		
Level of Service	D	D	D	B	E		E	F	D	D		
Approach Delay (s)	40.7				32.8	111.7				40.2		
Approach LOS	D				C	F				D		
Intersection Summary												
HCM Average Control Delay	63.6			HCM Level of Service					E			
HCM Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	110.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	71.5%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1216	867	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1280	913	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	84
Lane Group Flow (vph)	144	1280	975	0	107	24
Turn Type	Prot					Perm
Protected Phases	7	4	8	6		
Permitted Phases						6
Actuated Green, G (s)	23.5	77.0	49.0	24.0 24.0		
Effective Green, g (s)	24.0	77.5	49.5	24.5 24.5		
Actuated g/C Ratio	0.22	0.70	0.45	0.22 0.22		
Clearance Time (s)	4.5	4.5	4.5	4.5 4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0 3.0		
Lane Grp Cap (vph)	749	2493	1576	394 353		
v/s Ratio Prot	0.04	c0.36	c0.28	c0.06		
v/s Ratio Perm						0.02
v/c Ratio	0.19	0.51	0.62	0.27 0.07		
Uniform Delay, d1	35.1	7.5	23.1	35.4 33.7		
Progression Factor	0.66	0.90	1.00	1.00 1.00		
Incremental Delay, d2	0.1	0.6	1.8	1.7 0.4		
Delay (s)	23.3	7.3	24.9	37.1 34.1		
Level of Service	C	A	C	D C		
Approach Delay (s)	9.0		24.9	35.6		
Approach LOS	A		C	D		
Intersection Summary						
HCM Average Control Delay	17.1			HCM Level of Service		B
HCM Volume to Capacity ratio	0.50					
Actuated Cycle Length (s)	110.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	45.9%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	0.88
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	2787
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	2787
Volume (vph)	901	3	47	8	3	5	552	413	2	7	616	926
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	948	3	49	8	3	5	581	435	2	7	648	975
RTOR Reduction (vph)	0	0	35	0	5	0	0	0	0	0	0	234
Lane Group Flow (vph)	474	477	14	0	11	0	581	437	0	7	648	741
Turn Type	Split	Perm	Split		Prot		Prot		pm+ov			
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases		4										6
Actuated Green, G (s)	31.5	31.5	31.5		2.9		36.1	56.5		1.1	21.5	53.0
Effective Green, g (s)	32.0	32.0	32.0		3.4		36.6	57.0		1.6	22.0	54.0
Actuated g/C Ratio	0.29	0.29	0.29		0.03		0.33	0.52		0.01	0.20	0.49
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	489	490	461		54		589	1833		26	708	1368
v/s Ratio Prot	0.28	c0.28			c0.01		c0.33	0.12		0.00	c0.18	0.16
v/s Ratio Perm			0.01									0.11
v/c Ratio	0.97	0.97	0.03		0.21		0.99	0.24		0.27	0.92	0.54
Uniform Delay, d1	38.5	38.6	27.9		52.0		36.5	14.6		53.6	43.1	19.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.23	0.94	1.61
Incremental Delay, d2	32.5	33.6	0.0		1.9		33.3	0.3		4.0	14.4	0.3
Delay (s)	71.0	72.2	27.9		53.9		69.8	14.9		69.8	55.1	31.5
Level of Service	E	E	C		D		E	B		E	E	C
Approach Delay (s)		69.5			53.9			46.2			41.0	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM Average Control Delay		50.3										D
HCM Volume to Capacity ratio		0.94										
Actuated Cycle Length (s)		110.0						16.0				
Intersection Capacity Utilization		89.3%										E
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↱			↱
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	1020	0	0	890
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	1074	0	0	937
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						1034
pX, platoon unblocked	0.81					
vC, conflicting volume	2011	1074			1074	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2251	1074			1074	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	37	267			649	
Direction, Lane #						
Volume Total	0	1074	937			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.63	0.55			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			57.0%			ICU Level of Service B
Analysis Period (min)			15			

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↩	↩	↩	↩	↩	↩
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	144	31	12	359	363	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	152	33	13	378	382	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609	204	408			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609	204	408			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	96	99			
cM capacity (veh/h)	422	803	1147			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	152	33	13	189	189	255 154
Volume Left	152	0	13	0	0	0 0
Volume Right	0	33	0	0	0	0 26
cSH	422	803	1147	1700	1700	1700 1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15 0.09
Queue Length 95th (ft)	40	3	1	0	0	0 0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	16.7		0.3			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization		25.5%		ICU Level of Service		A
Analysis Period (min)		15				

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↩	↩	↩	↩	↩	↩
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	355	664	253	327	564
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	374	699	266	344	594
RTOR Reduction (vph)	0	292	0	151	0	0
Lane Group Flow (vph)	266	82	699	115	344	594
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	13.3	13.3	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.8	13.8	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	803	682	281	1217
v/s Ratio Prot	c0.15		c0.38		c0.19	0.32
v/s Ratio Perm		0.05		0.07		
v/c Ratio	0.69	0.24	0.87	0.17	1.22	0.49
Uniform Delay, d1	22.6	20.2	16.3	11.0	26.4	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	0.4	12.4	0.5	128.4	1.4
Delay (s)	27.5	20.6	28.7	11.5	154.8	6.9
Level of Service	C	C	C	B	F	A
Approach Delay (s)	23.5		24.0			61.2
Approach LOS	C		C			E
Intersection Summary						
HCM Average Control Delay		37.6		HCM Level of Service		D
HCM Volume to Capacity ratio		0.89				
Actuated Cycle Length (s)		62.9		Sum of lost time (s)		12.0
Intersection Capacity Utilization		77.1%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	707	53	116	630	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	744	56	122	663	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	43	0	0	75	0	58	71	0	56	0
Lane Group Flow (vph)	87	744	13	122	663	22	73	41	18	296	88	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	17.6	17.6	4.4	17.6	17.6	4.4	15.6	15.6	24.4	35.6	
Effective Green, g (s)	4.9	18.1	18.1	4.9	18.1	18.1	4.9	16.1	16.1	24.9	36.1	
Actuated g/C Ratio	0.06	0.23	0.23	0.06	0.23	0.23	0.06	0.20	0.20	0.31	0.45	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	801	358	210	801	358	210	317	303	551	751	
v/s Ratio Prot	0.05	c0.21		0.04	c0.19		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.81	0.93	0.04	0.58	0.83	0.06	0.35	0.13	0.06	0.54	0.12	
Uniform Delay, d1	37.1	30.3	24.1	36.6	29.5	24.3	36.0	26.2	25.8	22.8	12.7	
Progression Factor	1.00	1.00	1.00	0.90	0.54	0.23	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	33.9	16.8	0.0	3.0	5.3	0.1	1.0	0.9	0.4	1.0	0.3	
Delay (s)	70.9	47.1	24.2	36.0	21.1	5.6	37.0	27.1	26.2	23.8	13.0	
Level of Service	E	D	C	D	C	A	D	C	C	C	B	
Approach Delay (s)		48.0			21.5			29.6			20.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay		31.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		56.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												













18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3220	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3220	1441	3433	1863	1583
Volume (vph)	216	822	163	377	741	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	865	172	397	780	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	72	261	0	0	198
Lane Group Flow (vph)	227	865	57	397	780	108	182	443	104	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.17		0.12	c0.22		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.52	0.11	0.77	0.69	0.21	0.87	0.71	0.37	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.7	18.7	32.7	23.6	19.8	34.6	30.2	28.0	34.0	30.7	26.3
Progression Factor	0.80	0.52	0.36	0.87	0.82	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.9	0.8	0.3	5.7	2.7	0.8	29.1	3.8	0.8	11.1	15.4	0.2
Delay (s)	38.0	12.2	7.0	34.1	22.2	19.8	63.7	34.0	28.9	45.1	46.1	26.5
Level of Service	D	B	A	C	C	B	E	C	C	D	D	C
Approach Delay (s)		16.1			24.8			37.3			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		28.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		71.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												



























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↓	↑↑	↓		↑↓		↓	↑↓	↓
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.96		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4899		1770	3539	1583		1653		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.92		0.74	0.71	1.00
Satd. Flow (perm)		4899		1770	3539	1583		1548		1312	1255	1583
Volume (vph)	0	1263	408	68	1000	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1329	429	72	1053	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	66	0	0	0	0	0	12	0	0	0	55
Lane Group Flow (vph)	0	1692	0	72	1053	268	0	12	0	322	322	394
Turn Type	Prot			Free			Perm			Perm		
Protected Phases	4			3			2			6		
Permitted Phases				Free			2			6		
Actuated Green, G (s)	37.0			5.0			24.5			24.5		
Effective Green, g (s)	37.5			5.5			25.0			25.0		
Actuated g/C Ratio	0.47			0.07			0.31			0.31		
Clearance Time (s)	4.5			4.5			4.5			4.5		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	2296			122			2079			1583		
v/s Ratio Prot	c0.35			0.04			c0.30					
v/s Ratio Perm							0.17			0.01		
v/c Ratio	0.74			0.59			0.51			0.17		
Uniform Delay, d1	17.2			36.2			9.7			0.0		
Progression Factor	0.43			0.78			1.55			1.00		
Incremental Delay, d2	1.7			6.8			0.8			0.2		
Delay (s)	9.0			34.9			15.8			0.2		
Level of Service	A			C			B			A		
Approach Delay (s)	9.0			13.8			19.1			35.4		
Approach LOS	A			B			B			D		
Intersection Summary												
HCM Average Control Delay	17.4			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.76											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	70.9%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 				 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.79	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1446	
Volume (vph)	21	1567	298	0	853	383	464	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1649	314	0	898	403	488	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	2	0	2	0
Lane Group Flow (vph)	22	1649	314	0	898	403	488	179	180	0	16	0
Turn Type	Prot		Free		Free		Perm		Perm		Perm	
Protected Phases	7		4		8		2				6	
Permitted Phases			Free		Free		2		2		6	
Actuated Green, G (s)	2.2		51.7		80.0		19.3		19.3		19.3	
Effective Green, g (s)	2.7		52.2		80.0		19.8		19.8		19.8	
Actuated g/C Ratio	0.03		0.65		1.00		0.25		0.25		0.25	
Clearance Time (s)	4.5		4.5		4.5		4.5		4.5		4.5	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	60		4181		1583		2892		1583		667	
v/s Ratio Prot	0.01		c0.26		0.18		0.12		0.12		0.01	
v/s Ratio Perm			0.20		0.25		c0.18		0.12		0.04	
v/c Ratio	0.37		0.39		0.20		0.31		0.25		0.73	
Uniform Delay, d1	37.8		6.5		0.0		9.0		0.0		27.7	
Progression Factor	1.09		1.14		1.00		1.00		1.00		1.00	
Incremental Delay, d2	2.4		0.2		0.2		0.3		0.4		4.1	
Delay (s)	43.6		7.6		0.2		9.3		0.4		31.8	
Level of Service	D		A		A		A		A		C	
Approach Delay (s)	6.8		6.5		29.6		23.0		C		C	
Approach LOS	A		A		C		C		C		C	
Intersection Summary												
HCM Average Control Delay			11.5			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			50.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												


























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	4913		1610	3330	1583	1610	3387	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	4913		1610	3330	1583	1610	3387	1583
Volume (vph)	235	1232	462	165	694	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1297	486	174	731	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	306	0	57	0	0	0	208	0	0	133
Lane Group Flow (vph)	247	1297	180	174	887	0	229	483	46	180	381	27
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	9.9	31.5	31.5	8.5	30.1		15.3	15.3	15.3	14.3	14.3	14.3
Effective Green, g (s)	10.4	32.0	32.0	9.0	30.6		15.8	15.8	15.8	14.8	14.8	14.8
Actuated g/C Ratio	0.12	0.37	0.37	0.10	0.35		0.18	0.18	0.18	0.17	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	408	1858	578	182	1716		290	601	286	272	572	267
v/s Ratio Prot	0.07	c0.26		c0.10	0.18		0.14	c0.15		0.11	c0.11	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.61	0.70	0.31	0.96	0.52		0.79	0.80	0.16	0.66	0.67	0.10
Uniform Delay, d1	36.7	23.7	19.9	39.1	22.6		34.3	34.4	30.3	34.1	34.1	30.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	2.2	1.4	53.5	1.1		13.3	7.7	0.3	5.9	2.9	0.2
Delay (s)	39.2	25.9	21.3	92.6	23.7		47.6	42.1	30.6	40.0	37.0	30.9
Level of Service	D	C	C	F	C		D	D	C	D	D	C
Approach Delay (s)		26.4			34.5			40.4			36.4	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay	32.6			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	87.6			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	69.1%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												













22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3390		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3390		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	149	583	228	140	661	230	323	483	113	211	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	242	340	508	119	222	377	247
RTOR Reduction (vph)	0	59	0	0	0	183	0	0	78	0	0	181
Lane Group Flow (vph)	157	795	0	147	696	59	340	508	41	222	377	66
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.5	16.5		5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	17.0		6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	823		152	859	384	354	639	543	177	452	384
v/s Ratio Prot	c0.09	c0.23		0.08	0.20		c0.19	c0.27		c0.13	0.20	
v/s Ratio Perm						0.04			0.03			0.04
v/c Ratio	1.03	0.97		0.97	0.81	0.15	0.96	0.79	0.08	1.25	0.83	0.17
Uniform Delay, d1	32.0	26.2		31.9	25.0	20.8	27.7	20.8	15.5	31.5	25.2	20.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.0	23.1		62.4	5.8	0.2	37.3	9.9	0.3	152.1	16.4	1.0
Delay (s)	114.0	49.3		94.3	30.8	21.0	65.0	30.6	15.8	183.6	41.6	21.9
Level of Service	F	D		F	C	C	E	C	B	F	D	C
Approach Delay (s)		59.4			37.2			40.9			73.1	
Approach LOS		E			D			D			E	
Intersection Summary												
HCM Average Control Delay	51.6			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	70.0			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	81.6%			ICU Level of Service					D			
Analysis Period (min)	15											
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3519		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3519		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	812	32	53	914	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	855	34	56	962	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	3	0	0	0	96	0	58	0	0	72	0
Lane Group Flow (vph)	128	886	0	56	962	331	51	33	0	623	73	0
Turn Type	Prot			Prot	pm+ov		Prot			Prot		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases					8							
Actuated Green, G (s)	7.5	35.3		4.3	32.1	69.8	5.8	6.5		37.7	38.4	
Effective Green, g (s)	8.0	35.8		4.8	32.6	70.8	6.3	7.0		38.2	38.9	
Actuated g/C Ratio	0.08	0.35		0.05	0.32	0.70	0.06	0.07		0.38	0.38	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	1238		83	1133	1101	110	115		664	626	
v/s Ratio Prot	c0.07	0.25		0.03	c0.27	0.11	c0.03	0.02		c0.35	0.04	
v/s Ratio Perm					0.10							
v/c Ratio	0.92	0.72		0.67	0.85	0.30	0.46	0.29		0.94	0.12	
Uniform Delay, d1	46.6	28.6		47.7	32.3	6.0	46.1	45.0		30.7	20.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.9	3.6		19.5	8.0	0.2	3.1	1.4		20.9	0.1	
Delay (s)	99.5	32.2		67.3	40.3	6.1	49.2	46.4		51.5	20.4	
Level of Service	F	C		E	D	A	D	D		D	C	
Approach Delay (s)		40.6			31.2			47.4			45.7	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM Average Control Delay		38.0										
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		101.8						16.0				
Intersection Capacity Utilization		81.9%										
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	953	516	66	1115	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	543	69	1174	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	0	0	52	0
Lane Group Flow (vph)	0	1003	426	69	1174	0	0	0	0	674	220	0
Turn Type		Perm	Prot							Prot		
Protected Phases		4	3	8						1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.33					c0.20	0.14	
v/s Ratio Perm			0.27									
v/c Ratio		0.69	0.66	0.29	0.56					0.61	0.43	
Uniform Delay, d1		21.9	21.4	35.1	11.4					25.7	24.0	
Progression Factor		1.00	1.00	1.26	1.68					1.00	1.00	
Incremental Delay, d2		2.7	5.1	0.6	1.0					1.0	2.6	
Delay (s)		24.6	26.6	44.9	20.1					26.7	26.7	
Level of Service		C	C	D	C					C	C	
Approach Delay (s)		25.3			21.5				0.0		26.7	
Approach LOS		C			C				A		C	
Intersection Summary												
HCM Average Control Delay		24.4										
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		90.0								8.0		
Intersection Capacity Utilization		67.7%										
Analysis Period (min)		15										
c Critical Lane Group												






















25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↖↗	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	492	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	518	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	518	273
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	60.0			60.0	21.0	21.0
Effective Green, g (s)	60.5			60.5	21.5	21.5
Actuated g/C Ratio	0.67			0.67	0.24	0.24
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2379			2379	820	378
v/s Ratio Prot	c0.47			0.20	0.15	
v/s Ratio Perm						c0.17
v/c Ratio	0.71			0.30	0.63	0.72
Uniform Delay, d1	9.2			6.1	30.7	31.5
Progression Factor	0.38			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.3	1.6	6.7
Delay (s)	4.9			6.4	32.3	38.2
Level of Service	A			A	C	D
Approach Delay (s)	4.9			6.4	34.4	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay	12.6			HCM Level of Service		B
HCM Volume to Capacity ratio	0.71					
Actuated Cycle Length (s)	90.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	67.7%			ICU Level of Service		C
Analysis Period (min)	15					
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00			
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00			
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00			
Satd. Flow (prot)		1741			1819	1583	1770	3539	1583	1770	3534					
Flt Permitted		0.84			0.84	1.00	0.95	1.00	1.00	0.95	1.00					
Satd. Flow (perm)		1502			1560	1583	1770	3539	1583	1770	3534					
Volume (vph)	11	5	8	23	25	251	7	803	26	132	706			7		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	12	5	8	24	26	264	7	845	27	139	743			7		
RTOR Reduction (vph)	0	7	0	0	0	229	0	0	14	0	1			0		
Lane Group Flow (vph)	0	18	0	0	50	35	7	845	13	139	749			0		
Turn Type	Perm		Perm		Perm		Prot	Perm		Prot	Perm		Prot			
Protected Phases	4		8		8		5	2		1		6				
Permitted Phases	4		8		8			2								
Actuated Green, G (s)	6.4		6.4		6.4		0.9	25.4		6.9	31.4					
Effective Green, g (s)	6.9		6.9		6.9		1.4	25.9		7.4	31.9					
Actuated g/C Ratio	0.13		0.13		0.13		0.03	0.50		0.14	0.61					
Clearance Time (s)	4.5		4.5		4.5		4.5	4.5		4.5	4.5					
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0		3.0	3.0					
Lane Grp Cap (vph)	199		206		209		47	1756		251	2160					
v/s Ratio Prot							0.00	c0.24		c0.08	0.21					
v/s Ratio Perm	0.01		c0.03		0.02			0.01								
v/c Ratio	0.09		0.24		0.17		0.15	0.48		0.02	0.55		0.35			
Uniform Delay, d1	19.9		20.3		20.1		24.8	8.7		6.7	20.9		5.0			
Progression Factor	1.00		1.00		1.00		1.00	1.00		1.00	1.00		1.00			
Incremental Delay, d2	0.2		0.6		0.4		1.5	0.2		0.0	2.6		0.1			
Delay (s)	20.1		20.9		20.5		26.3	8.9		6.7	23.5		5.1			
Level of Service	C		C		C		C	A		A	C		A			
Approach Delay (s)	20.1		20.5				9.0				8.0					
Approach LOS	C		C				A				A					
Intersection Summary																
HCM Average Control Delay	10.4			HCM Level of Service						B						
HCM Volume to Capacity ratio	0.45															
Actuated Cycle Length (s)	52.2			Sum of lost time (s)						12.0						
Intersection Capacity Utilization	51.1%			ICU Level of Service						A						
Analysis Period (min)	15															
c Critical Lane Group																

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	287	2	12	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	302	2	13	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	304			175			493	493	172	494	495	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			175			493	493	172	494	495	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	100	100	100	100
cM capacity (veh/h)	1257			1402			484	474	872	482	473	737
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	312	15	1								
Volume Left	1	7	13	0								
Volume Right	5	2	2	0								
cSH	1257	1402	516	473								
Volume to Capacity	0.00	0.01	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	12.2	12.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.2	12.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			34.1%		ICU Level of Service			A				
Analysis Period (min)			15									

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	23	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	24	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	34	5								
Volume Left	1	4	24	4								
Volume Right	2	8	0	1								
cSH	1259	1424	502	532								
Volume to Capacity	0.00	0.00	0.07	0.01								
Queue Length 95th (ft)	0	0	5	1								
Control Delay (s)	0.1	0.1	12.7	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.7	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			27.8%		ICU Level of Service			A				
Analysis Period (min)			15									

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			193			493	493	181	521	505	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			193			493	493	181	521	505	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			75	100	97	100	100	100
cM capacity (veh/h)	1330			1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	193	275	147	0								
Volume Left	0	38	120	0								
Volume Right	24	0	27	0								
cSH	1330	1381	519	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	29	0								
Control Delay (s)	0.0	1.3	14.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.3	14.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		41.6%			ICU Level of Service				A			
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)			15			

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	←	↙	↖	↑	↗	↘	↓
Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	31	388	23	220	15	713	346	235	538
v/c Ratio	0.24	0.89	0.04	0.34	0.16	0.90	0.42	0.88	0.50
Control Delay	33.8	64.0	24.8	5.0	55.1	45.8	8.0	77.3	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	64.0	24.8	5.0	55.1	45.8	8.0	77.3	17.5
Queue Length 50th (ft)	10	269	11	0	10	472	39	165	204
Queue Length 95th (ft)	41	#466	29	51	33	#743	113	#322	382
Internal Link Dist (ft)	885		1130			954			1280
Turn Bay Length (ft)				35	150			150	
Base Capacity (vph)	259	435	730	754	95	792	820	267	1076
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.89	0.03	0.29	0.16	0.90	0.42	0.88	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↑	↗	↓
Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	190	406	889	304	361	792	33
v/c Ratio	0.65	0.68	0.79	0.30	0.73	0.73	0.06
Control Delay	47.0	10.4	31.7	11.3	37.2	6.7	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	10.4	31.7	11.3	37.2	6.7	17.0
Queue Length 50th (ft)	100	0	230	85	176	0	8
Queue Length 95th (ft)	189	88	303	130	#377	106	32
Internal Link Dist (ft)	2170			1080	1484		2210
Turn Bay Length (ft)							
Base Capacity (vph)	348	633	1745	1247	502	1087	554
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.64	0.51	0.24	0.72	0.73	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.











5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↙	←	↑	↘	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	939	198	1337	61	417	189	45
v/c Ratio	0.38	0.62	0.72	0.69	0.34	0.85	0.72	0.08
Control Delay	60.2	28.4	42.0	13.8	46.5	25.6	60.8	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	28.4	42.0	13.8	46.5	25.6	60.8	19.0
Queue Length 50th (ft)	29	266	124	177	41	51	128	17
Queue Length 95th (ft)	67	386	m153	344	74	156 m#227	m36	
Internal Link Dist (ft)		1080		1070	911			2200
Turn Bay Length (ft)	150		150					
Base Capacity (vph)	110	1507	274	1944	308	601	280	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.62	0.72	0.69	0.20	0.69	0.68	0.06
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	56	1159	287	536	1546	151	262	437	228	168
v/c Ratio	0.58	0.88	0.38	0.91	0.87	0.55	0.86	0.81	0.86	0.48
Control Delay	56.9	29.2	3.9	52.5	23.1	51.5	63.5	31.2	75.2	20.5
Queue Delay	0.0	4.7	0.0	0.0	0.7	0.0	0.2	0.0	0.0	0.0
Total Delay	56.9	33.9	3.9	52.5	23.8	51.5	63.7	31.2	75.2	20.5
Queue Length 50th (ft)	41	203	4	200	264	100	155	165	158	34
Queue Length 95th (ft)	m62	#344	m51	m223	m306	168	#315	#257	#289	101
Internal Link Dist (ft)		1070			550		710			2220
Turn Bay Length (ft)	150			150						
Base Capacity (vph)	97	1319	759	593	1768	274	303	539	274	351
Starvation Cap Reductn	0	0	0	0	55	0	0	0	0	0
Spillback Cap Reductn	0	111	0	0	0	0	1	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.96	0.38	0.90	0.90	0.55	0.87	0.81	0.83	0.48
Intersection Summary										
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m	Volume for 95th percentile queue is metered by upstream signal.									

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	165	1542	268	77	1251	768	293	400	368	477	320
v/c Ratio	0.71	0.98	0.36	0.87	0.92	0.76	0.95	0.91dl	0.98	0.93	0.90
Control Delay	61.3	30.1	4.5	103.7	30.1	7.0	86.1	46.4	74.8	71.8	56.2
Queue Delay	0.0	48.6	0.0	0.0	86.9	1.4	0.0	0.0	9.8	66.0	0.5
Total Delay	61.3	78.8	4.5	103.7	117.0	8.3	86.1	46.4	84.6	137.8	56.7
Queue Length 50th (ft)	112	276	10	55	451	31	227	144	202	173	138
Queue Length 95th (ft)	m131	#743	m26	m#89	m#564	m69	#413	200	#395	#271	#304
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	266	1572	741	89	1353	1008	307	625	377	515	356
Starvation Cap Reductn	0	23	0	0	307	97	0	0	0	0	0
Spillback Cap Reductn	0	195	0	0	57	0	0	0	15	100	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.12	0.36	0.87	1.20	0.84	0.95	0.64	1.02	1.15	0.90

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1538	853	81	1356	374	1040
v/c Ratio	0.85	0.88	0.43	0.66	0.67	1.34dr
Control Delay	17.5	12.0	67.6	26.9	37.9	54.5
Queue Delay	61.9	23.6	0.0	0.7	0.0	5.1
Total Delay	79.4	35.6	67.6	27.6	37.9	59.6
Queue Length 50th (ft)	345	134	31	365	245	378
Queue Length 95th (ft)	m392	m147	m44	518	364	#530
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1801	966	187	2059	556	1078
Starvation Cap Reductn	445	143	0	349	0	0
Spillback Cap Reductn	0	0	0	316	0	32
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.13	1.04	0.43	0.79	0.67	0.99

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	811	1103	525	497	481	499	601	9	18
v/c Ratio	0.82	0.59	0.89	0.35	0.85	0.88	0.45	0.03	0.07
Control Delay	45.7	4.8	53.9	13.9	60.2	62.7	17.2	40.4	28.4
Queue Delay	0.0	0.0	0.0	0.1	6.0	8.7	0.0	0.0	0.0
Total Delay	45.7	4.8	53.9	14.0	66.2	71.4	17.2	40.4	28.4
Queue Length 50th (ft)	173	102	205	154	369	384	93	6	6
Queue Length 95th (ft)	m227	157	#292	207	m423	m442	m110	20	27
Internal Link Dist (ft)	466		345		380			270	
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	994	1876	593	1427	565	568	1336	266	266
Starvation Cap Reductn	0	30	0	0	51	51	0	0	0
Spillback Cap Reductn	0	0	0	182	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.60	0.89	0.40	0.94	0.97	0.45	0.03	0.07
Intersection Summary									
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↘	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1280	980	107	108
v/c Ratio	0.19	0.51	0.62	0.27	0.25
Control Delay	23.8	7.5	25.0	37.6	8.2
Queue Delay	0.0	0.8	0.0	0.0	0.0
Total Delay	23.8	8.3	25.0	37.6	8.2
Queue Length 50th (ft)	43	108	268	63	0
Queue Length 95th (ft)	m59	140	337	113	45
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	749	2493	1582	394	437
Starvation Cap Reductn	0	818	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.76	0.62	0.27	0.25
Intersection Summary					
m	Volume for 95th percentile queue is metered by upstream signal.				







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	474	477	49	16	581	437	7	648	975
v/c Ratio	0.97	0.97	0.10	0.14	1.09	0.21	0.07	0.71	0.55
Control Delay	73.3	74.2	8.7	41.3	104.5	13.1	61.7	40.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	73.3	74.2	8.7	41.3	104.5	13.1	61.7	40.3	10.4
Queue Length 50th (ft)	347	350	0	8	~465	62	5	158	109
Queue Length 95th (ft)	#568	#573	29	30	#680	139	m8	m#327	m165
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	489	490	495	131	531	2036	100	911	1787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	186
Spillback Cap Reductn	0	0	0	0	0	119	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.97	0.10	0.12	1.09	0.23	0.07	0.71	0.61
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	374	699	266	344	594
v/c Ratio	0.68	0.58	0.87	0.32	1.22	0.49
Control Delay	32.2	6.8	32.0	3.1	156.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	6.8	32.0	3.1	156.4	7.7
Queue Length 50th (ft)	94	0	249	0	~176	109
Queue Length 95th (ft)	164	59	#453	38	#320	176
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	672	801	832	282	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.56	0.87	0.32	1.22	0.49
Intersection Summary						
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	744	56	122	663	97	73	99	89	296	144
v/c Ratio	0.65	0.93	0.14	0.47	0.83	0.22	0.28	0.24	0.22	0.56	0.17
Control Delay	60.0	51.5	8.8	36.9	25.1	2.3	38.1	12.1	7.9	28.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	51.5	8.8	36.9	25.1	2.3	38.1	12.1	7.9	28.4	5.6
Queue Length 50th (ft)	43	196	0	20	133	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#314	29	m38	m#242	m3	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	134	800	401	257	800	433	257	409	406	531	843
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.93	0.14	0.47	0.83	0.22	0.28	0.24	0.22	0.56	0.17
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.										
m	Volume for 95th percentile queue is metered by upstream signal.										

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	865	172	397	780	335	182	515	365	357	317	248
v/c Ratio	0.81	0.52	0.27	0.77	0.69	0.46	0.87	0.74	0.68	0.81	0.84	0.48
Control Delay	44.4	12.3	2.0	38.2	22.8	4.3	73.5	31.8	12.3	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	12.3	2.0	38.2	22.8	4.3	73.5	31.8	12.3	51.7	51.3	7.3
Queue Length 50th (ft)	73	60	4	106	206	34	92	108	18	92	151	0
Queue Length 95th (ft)	m#98	m66	m6	m#157	m256	m36	#210	163	108	#172	#279	57
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1134	735	210	755	561	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.52	0.27	0.77	0.69	0.46	0.87	0.68	0.65	0.81	0.80	0.47
Intersection Summary												
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m	Volume for 95th percentile queue is metered by upstream signal.											

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1758	72	1053	268	24	322	322	449
v/c Ratio	0.73	0.49	0.51	0.17	0.05	0.78	0.82	0.82
Control Delay	9.0	39.3	17.4	0.2	9.5	38.5	42.5	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	39.3	17.4	0.2	9.5	38.5	42.5	32.9
Queue Length 50th (ft)	143	37	231	0	2	143	146	160
Queue Length 95th (ft)	179	m53	337	m0	17	238	#267	268
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2414	147	2078	1583	576	476	455	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.49	0.51	0.17	0.04	0.68	0.71	0.72
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1649	314	898	403	488	181	182	18
v/c Ratio	0.17	0.39	0.20	0.29	0.25	0.73	0.48	0.49	0.05
Control Delay	40.0	8.4	0.2	9.7	0.4	33.8	28.7	28.8	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	8.4	0.2	9.7	0.4	33.8	28.7	28.8	17.8
Queue Length 50th (ft)	12	152	0	60	0	115	81	81	6
Queue Length 95th (ft)	m15	198	m0	139	0	147	126	127	19
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	4178	1583	3061	1583	1415	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	6	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.40	0.20	0.29	0.25	0.34	0.23	0.23	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1297	486	174	944	229	483	254	180	381	160
v/c Ratio	0.60	0.70	0.55	0.96	0.53	0.79	0.80	0.51	0.66	0.67	0.40
Control Delay	43.8	26.6	4.8	99.2	22.4	55.4	46.3	8.5	46.9	40.5	8.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	26.7	4.8	99.2	22.4	55.4	46.3	8.5	46.9	40.5	8.8
Queue Length 50th (ft)	69	230	1	101	143	137	145	0	104	110	0
Queue Length 95th (ft)	108	282	66	#229	185	#261	#220	63	181	160	52
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	428	1858	884	182	1772	301	622	503	297	626	423
Starvation Cap Reductn	0	94	2	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.74	0.55	0.96	0.53	0.76	0.78	0.50	0.61	0.61	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	242	340	508	119	222	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.43	0.96	0.79	0.19	1.25	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	183.8	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.0	70.2	32.2	4.5	183.8	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	~122	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	51	#298	#346	31	#247	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	568	354	639	621	177	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.43	0.96	0.79	0.19	1.25	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	↖	→	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	889	56	962	427	51	91	623	145
v/c Ratio	0.90	0.70	0.54	0.86	0.35	0.39	0.47	0.92	0.20
Control Delay	101.2	32.7	66.7	42.0	1.8	54.7	26.4	51.6	6.8
Queue Delay	0.0	0.1	0.0	2.2	0.0	0.0	0.1	0.1	0.0
Total Delay	101.2	32.8	66.7	44.2	1.8	54.7	26.4	51.7	6.8
Queue Length 50th (ft)	84	266	36	307	8	32	18	382	12
Queue Length 95th (ft)	#207	364	#92	#452	29	73	67	#650	51
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	142	1266	104	1121	1212	139	304	676	776
Starvation Cap Reductn	0	0	0	72	67	0	0	0	0
Spillback Cap Reductn	0	39	0	0	0	0	9	1	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.72	0.54	0.92	0.37	0.37	0.31	0.92	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	543	69	1174	674	272
v/c Ratio	0.67	0.70	0.27	0.56	0.61	0.48
Control Delay	25.3	20.2	44.1	20.5	28.6	20.6
Queue Delay	0.4	0.2	0.0	0.4	0.0	0.3
Total Delay	25.8	20.4	44.1	20.9	28.6	20.9
Queue Length 50th (ft)	256	170	38	296	164	86
Queue Length 95th (ft)	331	305	m72	362	222	161
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	780	295	2084	1106	562
Starvation Cap Reductn	149	24	0	399	0	0
Spillback Cap Reductn	48	0	0	149	0	46
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.72	0.23	0.70	0.61	0.53

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	518	287
v/c Ratio	0.71	0.30	0.63	0.73
Control Delay	5.5	7.3	33.4	39.9
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	5.5	7.4	33.4	39.9
Queue Length 50th (ft)	189	75	138	143
Queue Length 95th (ft)	250	142	162	201
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2378	2378	1221	574
Starvation Cap Reductn	60	0	0	0
Spillback Cap Reductn	0	143	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.32	0.42	0.50
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative C (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	50	264	7	845	27	139	750
v/c Ratio	0.09	0.18	0.55	0.04	0.48	0.03	0.45	0.31
Control Delay	15.3	19.1	7.9	23.7	12.4	5.2	23.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	19.1	7.9	23.7	12.4	5.2	23.0	5.6
Queue Length 50th (ft)	4	12	0	2	91	0	32	32
Queue Length 95th (ft)	20	36	48	12	168	12	86	125
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	480	489	651	192	1879	853	352	2430
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.10	0.41	0.04	0.45	0.03	0.39	0.31
Intersection Summary								

**NEAR-TERM 2008 + ALTERNATIVE D
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flt		0.91			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1783	1583	1770	1843		1770	1861	
Flt Permitted		1.00			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1699			1366	1583	1770	1843		1770	1861	
Volume (vph)	0	8	14	106	13	97	12	817	62	159	514	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	15	112	14	102	13	860	65	167	541	3
RTOR Reduction (vph)	0	13	0	0	0	84	0	3	0	0	0	0
Lane Group Flow (vph)	0	10	0	0	126	18	13	922	0	167	544	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		10.4			10.4	10.4	1.0	50.8		9.4	59.2	
Effective Green, g (s)		10.9			10.9	10.9	1.5	51.3		9.9	59.7	
Actuated g/C Ratio		0.13			0.13	0.13	0.02	0.61		0.12	0.71	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		220			177	205	32	1124		208	1321	
v/s Ratio Prot		0.01					0.01	c0.50		c0.09	0.29	
v/s Ratio Perm					c0.09	0.01						
v/c Ratio		0.05			0.71	0.09	0.41	0.82		0.80	0.41	
Uniform Delay, d1		32.0			35.1	32.2	40.9	12.8		36.1	5.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			12.7	0.2	8.2	4.9		19.6	0.2	
Delay (s)		32.1			47.8	32.4	49.1	17.7		55.8	5.2	
Level of Service		C			D	C	D	B		E	A	
Approach Delay (s)		32.1			40.9			18.2			17.1	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay		20.7										
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		84.1						12.0				
Intersection Capacity Utilization		78.8%										
Analysis Period (min)		15										
c Critical Lane Group												













2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Flt		0.95			1.00			0.87			0.95	
Flt Protected		1.00			0.97			1.00			0.98	
Satd. Flow (prot)		1758			1802			1627			1750	
Flt Permitted		0.98			0.70			0.99			0.72	
Satd. Flow (perm)		1719			1293			1619			1287	
Volume (vph)	10	131	94	345	201	10	10	25	486	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	138	99	363	212	11	11	26	512	11	11	11
RTOR Reduction (vph)	0	39	0	0	1	0	0	393	0	0	8	0
Lane Group Flow (vph)	0	209	0	0	585	0	0	156	0	0	25	0
Turn Type	Perm			Perm		Perm				Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8				2		6		
Actuated Green, G (s)		23.2			23.2			9.1			9.1	
Effective Green, g (s)		23.7			23.7			9.6			9.6	
Actuated g/C Ratio		0.57			0.57			0.23			0.23	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		986			742			376			299	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.45			c0.10			0.02	
v/c Ratio		0.21			0.79			0.41			0.08	
Uniform Delay, d1		4.3			6.8			13.5			12.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			5.6			0.7			0.1	
Delay (s)		4.4			12.4			14.2			12.5	
Level of Service		A			B			B			B	
Approach Delay (s)		4.4			12.4			14.2			12.5	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM Average Control Delay		11.7										
HCM Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		41.3						8.0				
Intersection Capacity Utilization		85.6%										
Analysis Period (min)		15										
c Critical Lane Group												

















3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↕↕↕↕↕↕↕↕↕↕↕↕												
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Volume (veh/h)	10	607	10	10	535	20	10	10	10	10	10	10	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	11	639	11	11	563	21	11	11	11	11	11	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None			None			
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	584			649				1276	1271	644	1276	1265	574
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	584			649				1276	1271	644	1276	1265	574
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99				92	94	98	92	94	98
cM capacity (veh/h)	990			937				132	164	473	131	165	518
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	660	595	32	32									
Volume Left	11	11	11	11									
Volume Right	11	21	11	11									
cSH	990	937	190	192									
Volume to Capacity	0.01	0.01	0.17	0.16									
Queue Length 95th (ft)	1	1	15	14									
Control Delay (s)	0.3	0.3	27.7	27.3									
Lane LOS	A	A	D	D									
Approach Delay (s)	0.3	0.3	27.7	27.3									
Approach LOS			D	D									
Intersection Summary													
Average Delay			1.6										
Intersection Capacity Utilization			47.8%	ICU Level of Service		A							
Analysis Period (min)			15										

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	   												
Sign Control	Free			Free			Stop			Stop			
Grade	0%												
Volume (veh/h)	10	606	10	10	535	10	10	10	10	10	10	10	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	11	638	11	11	563	11	11	11	11	11	11	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None			None			
Median storage veh													
Upstream signal (ft)	1160												
pX, platoon unblocked	0.87						0.87	0.87			0.87	0.87	0.87
vC, conflicting volume	574	648					1269	1259	643	1269	1259	568	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	513	648					1308	1296	643	1308	1296	507	
tC, single (s)	4.1	4.1					7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2	2.2					3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	99	99					90	92	98	90	92	98	
cM capacity (veh/h)	921	937					108	139	473	108	139	495	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	659	584	32	32									
Volume Left	11	11	11	11									
Volume Right	11	11	11	11									
cSH	921	937	162	162									
Volume to Capacity	0.01	0.01	0.20	0.19									
Queue Length 95th (ft)	1	1	17	17									
Control Delay (s)	0.3	0.3	32.6	32.5									
Lane LOS	A	A	D	D									
Approach Delay (s)	0.3	0.3	32.6	32.5									
Approach LOS			D	D									
Intersection Summary													
Average Delay			1.9										
Intersection Capacity Utilization	47.7%		ICU Level of Service		A								
Analysis Period (min)	15												

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕	↕	↕	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0	4.0		4.0
Lane Util. Factor		1.00			1.00			1.00	1.00	1.00		1.00
Flt		0.98			0.98			1.00	0.85	1.00		0.94
Flt Protected		1.00			0.99			0.96	1.00	0.95		1.00
Satd. Flow (prot)		1823			1813			1786	1583	1770		1749
Flt Permitted		0.89			0.82			0.73	1.00	0.95		1.00
Satd. Flow (perm)		1623			1496			1359	1583	1770		1749
Volume (vph)	60	489	77	116	494	99	35	6	266	112	21	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	515	81	122	520	104	37	6	280	118	22	15
RTOR Reduction (vph)	0	5	0	0	6	0	0	0	249	0	11	0
Lane Group Flow (vph)	0	654	0	0	740	0	0	43	31	118	26	0
Turn Type	Perm			Perm			Perm		Perm	Prot		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2			
Actuated Green, G (s)		51.6			51.6			8.4	8.4	6.5	19.4	
Effective Green, g (s)		52.1			52.1			8.9	8.9	7.0	19.9	
Actuated g/C Ratio		0.65			0.65			0.11	0.11	0.09	0.25	
Clearance Time (s)		4.5			4.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1057			974			151	176	155	435	
v/s Ratio Prot										c0.07	0.01	
v/s Ratio Perm		0.40			c0.50			c0.03	0.02			
v/c Ratio		0.62			0.76			0.28	0.18	0.76	0.06	
Uniform Delay, d1		8.1			9.6			32.6	32.2	35.7	22.9	
Progression Factor		1.00			1.53			1.00	1.00	1.00	1.02	
Incremental Delay, d2		2.7			4.8			1.0	0.5	19.6	0.1	
Delay (s)		10.9			19.5			33.7	32.7	55.3	23.3	
Level of Service		B			B			C	C	E	C	
Approach Delay (s)		10.9			19.5			32.8			47.7	
Approach LOS		B			B			C			D	
Intersection Summary												
HCM Average Control Delay		21.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		80.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0	4.0		4.0
Lane Util. Factor		1.00			1.00			1.00	1.00	1.00		1.00
Flt		0.98			0.98			1.00	0.85			0.96
Flt Protected		1.00			0.95			0.97	1.00			0.97
Satd. Flow (prot)		1814			1770			1805	1583			1732
Flt Permitted		0.93			0.95			0.72	1.00			0.67
Satd. Flow (perm)		1690			1770			1341	1583			1200
Volume (vph)	52	667	148	187	582	89	80	45	222	88	13	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	702	156	197	613	94	84	47	234	93	14	49
RTOR Reduction (vph)	0	9	0	0	6	0	0	0	195	0	22	0
Lane Group Flow (vph)	0	904	0	197	701	0	0	131	39	0	134	0
Turn Type	Perm			Prot			Perm		Perm	Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4						2		2			
Actuated Green, G (s)		42.2			11.6	58.3		12.7	12.7		12.7	
Effective Green, g (s)		42.7			12.1	58.8		13.2	13.2		13.2	
Actuated g/C Ratio		0.53			0.15	0.73		0.16	0.16		0.16	
Clearance Time (s)		4.5			4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		902			268	1342		221	261		198	
v/s Ratio Prot					c0.11	0.38						
v/s Ratio Perm		c0.53						0.10	0.02		c0.11	
v/c Ratio		1.00			0.74	0.52		0.59	0.15		0.68	
Uniform Delay, d1		18.6			32.4	4.6		30.9	28.6		31.4	
Progression Factor		0.96			1.23	0.76		1.00	1.00		1.00	
Incremental Delay, d2		26.5			7.0	1.0		4.2	0.3		8.9	
Delay (s)		44.4			46.8	4.5		35.1	28.8		40.3	
Level of Service		D			D	A		D	C		D	
Approach Delay (s)		44.4			13.7			31.1			40.3	
Approach LOS		D			B			C			D	
Intersection Summary												
HCM Average Control Delay		30.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		108.1%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3438		1770	1863	1583	1770	3539	1583	3433	1736	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3438		1770	1863	1583	1770	3539	1583	3433	1736	
Volume (vph)	101	709	166	181	546	540	204	155	265	451	131	108
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	106	746	175	191	575	568	215	163	279	475	138	114
RTOR Reduction (vph)	0	9	0	0	0	167	0	0	256	0	19	0
Lane Group Flow (vph)	106	912	0	191	575	401	215	163	23	475	233	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				
Actuated Green, G (s)	13.9	80.4		20.6	87.1	87.1	19.5	12.7	12.7	28.3	21.5	
Effective Green, g (s)	14.4	80.9		21.1	87.6	87.6	20.0	13.2	13.2	28.8	22.0	
Actuated g/C Ratio	0.09	0.51		0.13	0.55	0.55	0.12	0.08	0.08	0.18	0.14	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	159	1738		233	1020	867	221	292	131	618	239	
v/s Ratio Prot	0.06	0.27		c0.11	c0.31		c0.12	0.05		0.14	c0.13	
v/s Ratio Perm						0.25			0.01			
v/c Ratio	0.67	0.52		0.82	0.56	0.46	0.97	0.56	0.18	0.77	0.97	
Uniform Delay, d1	70.5	26.6		67.6	23.7	21.9	69.7	70.6	68.3	62.4	68.7	
Progression Factor	0.91	0.99		0.90	0.87	1.16	1.00	1.00	1.00	0.96	0.96	
Incremental Delay, d2	5.0	0.5		16.6	1.8	1.4	52.5	2.3	0.6	5.7	50.6	
Delay (s)	69.5	27.0		77.5	22.4	26.9	122.2	72.9	69.0	65.8	116.6	
Level of Service	E	C		E	C	C	F	E	E	E	F	
Approach Delay (s)		31.4			32.2			87.4			83.4	
Approach LOS		C			C			F			F	
Intersection Summary												
HCM Average Control Delay		51.6			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		73.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Volume (vph)	5	30	140	5	95	95	164	157	5	30	208	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	165	5	32	219	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	0	2	0	2	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	165	3	32	222	0
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot		
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases				4					2			
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.8	48.9	48.9	3.3	39.4	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		13.3	49.4	49.4	3.8	39.9	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.17	0.62	0.62	0.05	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		294	2185	978	84	1759	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.59	0.08	0.00	0.38	0.13	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.8	6.1	5.9	37.0	10.7	
Progression Factor	1.00	1.00	1.00	0.83	1.34		1.10	0.68	0.57	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.2	0.4		2.5	0.1	0.0	2.9	0.1	
Delay (s)	39.7	32.4	32.1	32.9	44.0		36.3	4.2	3.4	39.8	10.9	
Level of Service	D	C	C	C	D		D	A	A	D	B	
Approach Delay (s)		32.3			43.7			20.4			14.5	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM Average Control Delay		25.9			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.25										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		30.7%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												





























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↑	↑↑	↑↑					↓	↑↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0		
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91		
Frt		1.00	0.85	1.00	1.00					1.00	0.90		
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00		
Satd. Flow (prot)		3539	1583	3433	3539					1610	3058		
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00		
Satd. Flow (perm)		3539	1583	3433	3539					1610	3058		
Volume (vph)	0	878	547	89	652	0	0	0	0	328	324	610	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	924	576	94	686	0	0	0	0	345	341	642	
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	155	0	
Lane Group Flow (vph)	0	924	433	94	686	0	0	0	0	345	828	0	
Turn Type	Perm		Prot		Perm		Perm		Perm		Perm		
Protected Phases	4		3		8						6		
Permitted Phases			4								6		
Actuated Green, G (s)	36.6		36.6		4.4		45.5				25.5		
Effective Green, g (s)	37.1		37.1		4.9		46.0				26.0		
Actuated g/C Ratio	0.46		0.46		0.06		0.58				0.32		
Clearance Time (s)	4.5		4.5		4.5		4.5				4.5		
Vehicle Extension (s)	3.0		3.0		3.0		3.0				3.0		
Lane Grp Cap (vph)	1641		734		210		2035				523		
v/s Ratio Prot	0.26		0.03		c0.19								
v/s Ratio Perm			c0.27								0.21		
v/c Ratio	0.56		0.59		0.45		0.34				0.66		
Uniform Delay, d1	15.6		15.8		36.2		9.0				23.2		
Progression Factor	1.35		1.82		1.11		1.28				1.00		
Incremental Delay, d2	1.1		2.7		1.3		0.4				6.4		
Delay (s)	22.1		31.5		41.7		11.9				29.6		
Level of Service	C		C		D		B				C		
Approach Delay (s)	25.7				15.5				0.0		32.2		
Approach LOS	C				B				A		C		
Intersection Summary													
HCM Average Control Delay	25.9		HCM Level of Service		C								
HCM Volume to Capacity ratio	0.64												
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		8.0								
Intersection Capacity Utilization	72.6%		ICU Level of Service		C								
Analysis Period (min)	15												
dr Defacto Right Lane. Recode with 1 though lane as a right lane.													
c Critical Lane Group													












10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		  			 			 			 		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00		
Flt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97		
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00		
Satd. Flow (prot)		5085	1583	3433	3407		1681	1720	2787	1770	1814		
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00		
Satd. Flow (perm)		5085	1583	3433	3407		1681	1720	2787	1770	1814		
Volume (vph)	0	565	641	413	352	117	390	108	569	42	41	9	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	595	675	435	371	123	411	114	599	44	43	9	
RTOR Reduction (vph)	0	0	274	0	33	0	0	0	475	0	7	0	
Lane Group Flow (vph)	0	595	401	435	461	0	256	269	124	44	45	0	
Turn Type	Prot	pm+ov		Prot			Split	Perm		Split			
Protected Phases	7	4	2	3	8	2		2	6		6		
Permitted Phases	4							2					
Actuated Green, G (s)	17.5	33.5	12.5	34.5	16.0		16.0	16.0	16.0	16.0			
Effective Green, g (s)	18.0	34.5	13.0	35.0	16.5		16.5	16.5	16.5	16.5			
Actuated g/C Ratio	0.22	0.43	0.16	0.44	0.21		0.21	0.21	0.21	0.21			
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	1144	683	558	1491	347		355	575	365	374			
v/s Ratio Prot	0.12	c0.12	c0.13	0.14	0.15		c0.16	c0.02		0.02			
v/s Ratio Perm	0.13							0.04					
v/c Ratio	0.52	0.59	0.78	0.31	0.74		0.76	0.21	0.12	0.12			
Uniform Delay, d1	27.2	17.3	32.1	14.6	29.7		29.9	26.4	25.8	25.8			
Progression Factor	1.50	4.80	1.18	1.22	0.87		0.87	1.40	0.86	0.84			
Incremental Delay, d2	1.4	3.0	6.3	0.5	12.5		13.4	0.8	0.7	0.7			
Delay (s)	42.2	86.2	44.1	18.4	38.3		39.2	37.7	22.9	22.4			
Level of Service	D	F	D	B	D		D	D	C	C			
Approach Delay (s)	65.6	30.4			38.2		22.6						
Approach LOS	E	C			D		C						
Intersection Summary													
HCM Average Control Delay	45.8			HCM Level of Service				D					
HCM Volume to Capacity ratio	0.55												
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0					
Intersection Capacity Utilization	64.8%			ICU Level of Service				C					
Analysis Period (min)	15												
c Critical Lane Group													






















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	977	645	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1028	679	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1028	710	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.9	50.5	36.1		20.5	20.5
Effective Green, g (s)	10.4	51.0	36.6		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	446	2256	1607		465	416
v/s Ratio Prot	0.06	c0.29	0.20		c0.05	
v/s Ratio Perm						0.04
v/c Ratio	0.46	0.46	0.44		0.21	0.16
Uniform Delay, d1	32.2	7.4	14.8		23.0	22.7
Progression Factor	0.93	2.08	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.6	0.9		1.0	0.8
Delay (s)	30.6	16.0	15.6		24.0	23.5
Level of Service	C	B	B		C	C
Approach Delay (s)		18.4	15.6		23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay	18.3			HCM Level of Service		B
HCM Volume to Capacity ratio	0.38					
Actuated Cycle Length (s)	80.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	40.2%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						












12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	420	3	40	8	3	5	514	489	2	7	435	646
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	442	3	42	8	3	5	541	515	2	7	458	680
RTOR Reduction (vph)	0	0	34	0	5	0	0	0	0	0	0	523
Lane Group Flow (vph)	221	224	8	0	11	0	541	517	0	7	458	157
Turn Type	Split			Perm	Split		Prot			Prot		Perm
Protected Phases	4	4			8	8	5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	15.4	15.4	15.4		1.5		27.1	43.6		1.5	18.0	18.0
Effective Green, g (s)	15.9	15.9	15.9		2.0		27.6	44.1		2.0	18.5	18.5
Actuated g/C Ratio	0.20	0.20	0.20		0.02		0.35	0.55		0.02	0.23	0.23
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	334	335	315		44		611	1950		44	818	366
v/s Ratio Prot	0.13	c0.13			c0.01		c0.31	0.15		0.00	c0.13	
v/s Ratio Perm			0.01									0.10
v/c Ratio	0.66	0.67	0.03		0.25		0.89	0.26		0.16	0.56	0.43
Uniform Delay, d1	29.6	29.6	25.8		38.3		24.7	9.4		38.2	27.2	26.2
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.35	1.02	5.40
Incremental Delay, d2	4.9	5.0	0.0		3.0		14.4	0.3		1.2	1.9	2.5
Delay (s)	34.4	34.6	25.9		41.3		39.1	9.8		52.6	29.5	144.3
Level of Service	C	C	C		D		D	A		D	C	F
Approach Delay (s)	33.8				41.3		24.8			97.8		
Approach LOS	C				D		C			F		
Intersection Summary												
HCM Average Control Delay			57.4	HCM Level of Service					E			
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			80.0	Sum of lost time (s)			16.0					
Intersection Capacity Utilization			81.8%	ICU Level of Service			D					
Analysis Period (min)			15									
c Critical Lane Group												














13: Project Access & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583	1863	1583		1863
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1770	1583	1863	1583		1863
Volume (vph)	192	59	832	419	0	634
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	202	62	876	441	0	667
RTOR Reduction (vph)	0	49	0	158	0	0
Lane Group Flow (vph)	202	13	876	283	0	667
Turn Type	Perm		Perm			
Protected Phases	8		2		6	
Permitted Phases	8		2			
Actuated Green, G (s)	11.4	11.4	35.3	35.3	35.3	
Effective Green, g (s)	11.9	11.9	35.8	35.8	35.8	
Actuated g/C Ratio	0.21	0.21	0.64	0.64	0.64	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	378	338	1197	1017	1197	
v/s Ratio Prot	c0.11		c0.47		0.36	
v/s Ratio Perm	0.01		0.18			
v/c Ratio	0.53	0.04	0.73	0.28	0.56	
Uniform Delay, d1	19.4	17.4	6.7	4.3	5.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.0	2.3	0.2	0.6	
Delay (s)	20.9	17.4	9.1	4.5	6.1	
Level of Service	C	B	A	A	A	
Approach Delay (s)	20.1		7.5		6.1	
Approach LOS	C		A		A	
Intersection Summary						
HCM Average Control Delay	8.6		HCM Level of Service		A	
HCM Volume to Capacity ratio	0.68					
Actuated Cycle Length (s)	55.7		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	61.1%		ICU Level of Service		B	
Analysis Period (min)	15					
c Critical Lane Group						













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6			0.0
Approach LOS	D					
Intersection Summary						
Average Delay	5.8					
Intersection Capacity Utilization	37.7%			ICU Level of Service		A
Analysis Period (min)	15					













16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	537	714	251	255	569
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	565	752	264	268	599
RTOR Reduction (vph)	0	280	0	151	0	0
Lane Group Flow (vph)	271	285	752	113	268	599
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.7	13.7	26.6	26.6	9.5	40.6
Effective Green, g (s)	14.2	14.2	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	397	355	798	678	280	1210
v/s Ratio Prot	0.15		c0.40		c0.15	0.32
v/s Ratio Perm		c0.18		0.07		
v/c Ratio	0.68	0.80	0.94	0.17	0.96	0.50
Uniform Delay, d1	22.5	23.2	17.4	11.1	26.4	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	12.3	20.6	0.5	41.7	1.4
Delay (s)	27.3	35.5	37.9	11.7	68.2	7.2
Level of Service	C	D	D	B	E	A
Approach Delay (s)	32.9		31.1		26.0	
Approach LOS	C		C		C	
Intersection Summary						
HCM Average Control Delay			30.0	HCM Level of Service		C
HCM Volume to Capacity ratio			0.91			
Actuated Cycle Length (s)			63.3	Sum of lost time (s)		12.0
Intersection Capacity Utilization			77.5%	ICU Level of Service		D
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	643	36	202	826	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	677	38	213	869	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	117	0	63	70	0	59	0
Lane Group Flow (vph)	53	677	9	213	869	45	67	34	15	284	90	0
Turn Type	Prot		Perm		Prot		Perm		Prot		Perm	
Protected Phases	7		4		3		8		5		2	
Permitted Phases			4				8				2	
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.19		0.06	c0.25		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.81	0.02	0.83	0.94	0.11	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	28.9	23.5	36.5	28.8	22.4	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	0.97	0.54	0.20	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	6.1	0.0	13.2	11.4	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	35.1	23.6	48.4	27.1	4.5	36.8	28.5	27.7	23.4	14.2	
Level of Service	D	D	C	D	C	A	D	C	C	C	B	
Approach Delay (s)		35.7			27.8			30.4			20.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			29.1								C	
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			80.0								12.0	
Intersection Capacity Utilization			58.6%								B	
Analysis Period (min)			15									
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	744	146	371	907	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	783	154	391	955	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	239	0	117	227	0	0	206
Lane Group Flow (vph)	245	783	51	391	955	138	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.15		0.11	c0.27		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.09			0.03			0.03
v/c Ratio	0.88	0.46	0.10	0.76	0.83	0.27	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.1	18.5	32.6	25.1	20.0	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.80	0.52	0.40	0.73	0.66	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.7	0.7	0.3	4.8	5.4	1.0	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	46.0	11.6	7.7	28.4	21.9	11.6	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	C	B	D	C	C	D	D	C
Approach Delay (s)		18.2			21.1			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.4			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		73.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												





















19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00				1.00	0.95	0.95
Frt		0.97		1.00	1.00	0.85				0.90	1.00	1.00
Flt Protected		1.00		0.95	1.00	1.00				0.99	0.95	0.95
Satd. Flow (prot)		4928		1770	3539	1583				1658	1681	1686
Flt Permitted		1.00		0.95	1.00	1.00				0.91	0.74	0.71
Satd. Flow (perm)		4928		1770	3539	1583				1529	1311	1254
Volume (vph)	0	1215	314	68	1275	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1279	331	72	1342	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	54	0	0	0	0	0	12	0	0	0	25
Lane Group Flow (vph)	0	1556	0	72	1342	209	0	13	0	370	370	344
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free	2				6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2211		117	2000	1583		512		439	420	530
v/s Ratio Prot		0.32		0.04	c0.38							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.22
v/c Ratio		0.70		0.62	0.67	0.13		0.03		0.84	0.88	0.65
Uniform Delay, d1		17.8		36.4	12.2	0.0		17.8		24.6	25.1	22.6
Progression Factor		0.42		0.89	1.43	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.6		8.2	1.6	0.2		0.0		13.7	18.9	2.7
Delay (s)		9.0		40.5	19.0	0.2		17.9		38.4	44.0	25.3
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.0			17.5			17.9			35.9	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		19.1			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		70.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												




















20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.81	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1475	
Volume (vph)	17	1638	273	0	993	350	546	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1724	287	0	1045	368	575	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1724	287	0	1045	368	575	160	160	0	16	0
Turn Type	Prot		Free			Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases			Free			Free	2		2		6	
Actuated Green, G (s)	2.2	49.1	80.0		42.4	80.0	21.9	21.9	21.9		21.9	
Effective Green, g (s)	2.7	49.6	80.0		42.9	80.0	22.4	22.4	22.4		22.4	
Actuated g/C Ratio	0.03	0.62	1.00		0.54	1.00	0.28	0.28	0.28		0.28	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3973	1583		2727	1583	755	421	421		413	
v/s Ratio Prot	0.01	c0.27			0.21		0.11					
v/s Ratio Perm			0.18			0.23	c0.21		0.11		0.01	
v/c Ratio	0.30	0.43	0.18		0.38	0.23	0.76	0.38	0.38		0.04	
Uniform Delay, d1	37.7	7.9	0.0		10.8	0.0	26.4	23.2	23.2		21.0	
Progression Factor	1.06	1.08	1.00		1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.8	0.2	0.2		0.4	0.3	4.6	0.6	0.6		0.0	
Delay (s)	41.9	8.8	0.2		11.2	0.3	30.9	23.8	23.8		21.0	
Level of Service	D	A	A		B	A	C	C	C		C	
Approach Delay (s)		7.8			8.4			28.4			21.0	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM Average Control Delay	12.3			HCM Level of Service				B				
HCM Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				8.0				
Intersection Capacity Utilization	49.7%			ICU Level of Service				A				
Analysis Period (min)	15											
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583	
Volume (vph)	270	1145	545	141	779	170	380	286	224	102	230	183	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	284	1205	574	148	820	179	400	301	236	107	242	193	
RTOR Reduction (vph)	0	0	72	0	37	0	0	0	192	0	0	165	
Lane Group Flow (vph)	284	1205	502	148	962	0	226	475	44	107	242	28	
Turn Type	Prot	pm+ov			Prot	Split			Perm	Split		Perm	
Protected Phases	7	4	2	3		8	2		2	6		6	
Permitted Phases	4												
Actuated Green, G (s)	11.6	32.6	48.2	7.5	28.5	15.6		15.6	15.6	11.7	11.7	11.7	
Effective Green, g (s)	12.1	33.1	49.2	8.0	29.0	16.1		16.1	16.1	12.2	12.2	12.2	
Actuated g/C Ratio	0.14	0.39	0.58	0.09	0.34	0.19		0.19	0.19	0.14	0.14	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	486	1372	986	166	1681	304		628	298	230	484	226	
v/s Ratio Prot	0.08	c0.34	0.10	c0.08	0.19	0.14		c0.14		0.07	c0.07		
v/s Ratio Perm	0.22			0.03									0.02
v/c Ratio	0.58	0.88	0.51	0.89	0.57	0.74		0.76	0.15	0.47	0.50	0.12	
Uniform Delay, d1	34.3	24.3	10.9	38.3	23.1	32.7		32.8	28.9	33.6	33.8	31.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.8	8.2	0.4	40.3	1.4	9.5		5.2	0.2	1.5	0.8	0.2	
Delay (s)	36.1	32.5	11.3	78.5	24.5	42.2		38.0	29.2	35.1	34.6	32.2	
Level of Service	D	C	B	E	C	D		D	C	D	C	C	
Approach Delay (s)	27.1				31.5		36.8		33.8				
Approach LOS	C				C		D		C				
Intersection Summary													
HCM Average Control Delay	30.9			HCM Level of Service					C				
HCM Volume to Capacity ratio	0.79												
Actuated Cycle Length (s)	85.4			Sum of lost time (s)					16.0				
Intersection Capacity Utilization	71.8%			ICU Level of Service					C				
Analysis Period (min)	15												
c Critical Lane Group													

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	271	321	494	108	244	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	285	338	520	114	257	360	231
RTOR Reduction (vph)	0	67	0	0	218	0	0	75	0	0	174	
Lane Group Flow (vph)	140	655	0	135	620	67	338	520	39	257	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2				6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		c0.15	0.19	
v/s Ratio Perm					0.04			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.18	0.94	0.81	0.07	1.44	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	21.2	27.3	20.5	15.2	31.1	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.2	33.1	10.4	0.3	225.0	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	21.4	60.4	30.9	15.4	256.1	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	F	D	C
Approach Delay (s)		39.7			32.0			39.4			99.3	
Approach LOS		D			C			D			F	
Intersection Summary												
HCM Average Control Delay		51.0										
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		69.3										
Intersection Capacity Utilization		79.8%										
Analysis Period (min)		15										
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3518		1770	3539	1583	1770	1660	1583	1770	1649	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3518		1770	3539	1583	1770	1660	1583	1770	1649	1583
Volume (vph)	102	773	32	53	906	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	814	34	56	954	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	113	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	845	0	56	954	238	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8							6
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1126		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.24		0.03	c0.27		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.15							
v/c Ratio	0.67	0.75		0.58	0.95	0.53	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	27.4		41.6	31.5	27.1	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.64	0.55	0.23	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	4.6		7.7	16.5	3.8	22.4	1.0		5.7	0.1	
Delay (s)	50.4	32.0		34.4	33.7	10.2	64.9	40.2		30.6	16.7	
Level of Service	D	C		C	C	B	E	D		C	B	
Approach Delay (s)		34.1			27.7		49.1				27.8	
Approach LOS		C			C		D				C	
Intersection Summary												
HCM Average Control Delay		30.6										
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		90.0										
Intersection Capacity Utilization		76.0%										
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↓	↑↑					↓	↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	509	99	1068	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	536	104	1124	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	135	0	0	0	0	0	0	0	58	0
Lane Group Flow (vph)	0	862	401	104	1124	0	0	0	0	673	165	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		0.24		0.06		c0.32				c0.20	0.10	
v/s Ratio Perm		c0.25										
v/c Ratio		0.59	0.62	0.44	0.54					0.61	0.32	
Uniform Delay, d1		20.7	21.0	35.8	11.1					25.7	23.1	
Progression Factor		0.49	0.46	1.32	1.81					1.00	1.00	
Incremental Delay, d2		1.2	3.0	1.2	0.9					1.0	1.7	
Delay (s)		11.3	12.7	48.3	21.1					26.7	24.7	
Level of Service		B	B	D	C					C	C	
Approach Delay (s)		11.8		23.4		0.0				26.2		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		19.5		HCM Level of Service		B						
HCM Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		65.2%		ICU Level of Service		C						
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↓↓	↓
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	519	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	546	248
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	1538	0	0	649	546	228
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	61.1			61.1	19.9	19.9
Effective Green, g (s)	61.6			61.6	20.4	20.4
Actuated g/C Ratio	0.68			0.68	0.23	0.23
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2422			2422	778	359
v/s Ratio Prot	c0.43			0.18	c0.16	
v/s Ratio Perm				0.14		
v/c Ratio	0.64			0.27	0.70	0.63
Uniform Delay, d1	7.9			5.5	32.0	31.4
Progression Factor	0.38			1.00	1.00	1.00
Incremental Delay, d2	1.0			0.3	2.9	3.6
Delay (s)	4.0			5.8	34.9	35.1
Level of Service	A			A	C	D
Approach Delay (s)	4.0			5.8	34.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			12.6	HCM Level of Service		B
HCM Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			65.2%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00			1.00	1.00		0.95	1.00		1.00	0.95
Flt		0.94			1.00	0.85		1.00	0.85		1.00	1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1718			1842	1583		1770	3539		1770	3536
Flt Permitted		0.92			0.94	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1601			1747	1583		1770	3539		1770	3536
Volume (vph)	7	6	11	2	7	209	19	774	20	116	630	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	6	12	2	7	220	20	815	21	122	663	4
RTOR Reduction (vph)	0	10	0	0	0	190	0	0	10	0	0	0
Lane Group Flow (vph)	0	15	0	0	9	30	20	815	11	122	667	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		6.3			6.3	6.3	0.9	25.1	25.1	4.7	28.9	
Effective Green, g (s)		6.8			6.8	6.8	1.4	25.6	25.6	5.2	29.4	
Actuated g/C Ratio		0.14			0.14	0.14	0.03	0.52	0.52	0.10	0.59	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		219			240	217	50	1827	817	186	2096	
v/s Ratio Prot							0.01	c0.23		c0.07	c0.19	
v/s Ratio Perm		0.01			0.01	c0.02			0.01			
v/c Ratio		0.07			0.04	0.14	0.40	0.45	0.01	0.66	0.32	
Uniform Delay, d1		18.6			18.6	18.8	23.7	7.5	5.8	21.3	5.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.1	0.3	5.2	0.2	0.0	8.1	0.1	
Delay (s)		18.8			18.6	19.1	28.9	7.7	5.9	29.4	5.2	
Level of Service		B			B	B	C	A	A	C	A	
Approach Delay (s)		18.8			19.1			8.2			8.9	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay		9.9					HCM Level of Service		A			
HCM Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		49.6					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		47.7%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	15	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	16	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	17	1								
Volume Left	1	4	16	0								
Volume Right	3	2	1	0								
cSH	1359	1432	598	557								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	11.2	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.2	11.5								
Approach LOS		B	B									
Intersection Summary												
Average Delay		0.6										
Intersection Capacity Utilization		27.5%					ICU Level of Service		A			
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			24.0%		ICU Level of Service			A				
Analysis Period (min)			15									

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			27.4%		ICU Level of Service	A
Analysis Period (min)			15			

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			32.1%		ICU Level of Service		A					
Analysis Period (min)			15									

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			22.4%		ICU Level of Service	A
Analysis Period (min)			15			

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	126	102	13	925	167	544
v/c Ratio	0.09	0.60	0.31	0.11	0.84	0.76	0.38
Control Delay	19.2	44.6	10.9	43.4	23.6	59.1	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	44.6	10.9	43.4	23.6	59.1	6.3
Queue Length 50th (ft)	4	63	3	7	378	88	83
Queue Length 95th (ft)	24	121	44	26	#709	#206	230
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	350	271	392	123	1142	226	1428
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.46	0.26	0.11	0.81	0.74	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	248	586	549	33
v/c Ratio	0.25	0.81	0.72	0.10
Control Delay	3.9	19.3	8.8	12.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.9	19.3	8.8	12.9
Queue Length 50th (ft)	11	67	7	4
Queue Length 95th (ft)	53	#344	78	22
Internal Link Dist (ft)	1130	2170	446	2150
Turn Bay Length (ft)				
Base Capacity (vph)	1163	847	922	554
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.69	0.60	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	←	↑	↘	↙	↓
Lane Group	EBT	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	659	746	43	280	118	37
v/c Ratio	0.62	0.78	0.26	0.66	0.76	0.08
Control Delay	11.9	22.1	35.2	12.3	66.2	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	22.1	35.2	12.3	66.2	15.1
Queue Length 50th (ft)	158	316	20	0	59	9
Queue Length 95th (ft)	327	#593	46	63	#143	21
Internal Link Dist (ft)	1080	1070	911			2200
Turn Bay Length (ft)						
Base Capacity (vph)	1067	953	312	557	155	622
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.78	0.14	0.50	0.76	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	↘	←	↑	↙	↓
Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	913	197	707	131	234	156
v/c Ratio	1.00	0.74	0.52	0.58	0.51	0.67
Control Delay	45.5	53.9	4.8	40.5	8.4	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	53.9	4.8	40.5	8.4	39.8
Queue Length 50th (ft)	-506	117	73	61	0	61
Queue Length 95th (ft)	#916 m#228	m234	110	56	118	
Internal Link Dist (ft)	1070		550	687		2220
Turn Bay Length (ft)						
Base Capacity (vph)	913	267	1348	291	521	292
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.74	0.52	0.45	0.45	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	106	921	191	575	568	215	163	279	475	252
v/c Ratio	0.67	0.53	0.82	0.56	0.55	0.97	0.56	0.72	0.77	0.98
Control Delay	74.0	27.5	82.3	23.4	10.7	122.0	77.8	18.3	69.2	109.3
Queue Delay	0.0	0.6	0.1	12.5	2.0	0.0	0.0	2.2	569.6	0.0
Total Delay	74.0	28.1	82.4	35.9	12.7	122.0	77.8	20.5	638.8	109.3
Queue Length 50th (ft)	112	284	208	328	172	228	87	0	247	245
Queue Length 95th (ft)	m125	m359	m266	m426	m101	#402	127	95	#352	#436
Internal Link Dist (ft)		550		220			110			270
Turn Bay Length (ft)						150		100	275	
Base Capacity (vph)	531	1746	597	1020	1034	221	376	418	619	258
Starvation Cap Reductn	0	427	63	423	310	0	0	0	0	0
Spillback Cap Reductn	0	48	0	0	0	0	0	56	409	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.70	0.36	0.96	0.78	0.97	0.43	0.77	2.26	0.98

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↗	↖	←	↖	↑	↖	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	165	5	32	224
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.59	0.07	0.00	0.20	0.12
Control Delay	34.4	32.8	11.5	28.4	24.9	40.0	4.1	3.4	35.8	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	28.4	24.9	40.0	4.1	3.4	35.8	11.4
Queue Length 50th (ft)	2	15	0	2	34	93	5	0	15	24
Queue Length 95th (ft)	13	39	49	m5	m61	123	31	m1	40	65
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	399	2462	1102	184	1918
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	924	576	94	686	345	983
v/c Ratio	0.55	0.65	0.37	0.34	0.66	1.00dr
Control Delay	22.0	18.3	42.8	12.0	30.4	28.2
Queue Delay	2.8	3.3	0.0	0.1	0.0	0.8
Total Delay	24.8	21.6	42.8	12.0	30.4	29.0
Queue Length 50th (ft)	284	258	21	73	161	195
Queue Length 95th (ft)	302	332	m34	95	261	#313
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1149
Starvation Cap Reductn	618	218	0	0	0	0
Spillback Cap Reductn	0	0	0	253	0	36
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.85	0.37	0.38	0.66	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	595	675	435	494	256	269	599	44	52
v/c Ratio	0.52	0.71	0.78	0.32	0.74	0.76	0.57	0.12	0.14
Control Delay	42.4	15.3	48.2	16.4	39.9	40.9	5.9	23.1	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	15.3	48.2	16.4	39.9	40.9	5.9	23.1	19.0
Queue Length 50th (ft)	131	251	120	108	89	94	0	22	23
Queue Length 95th (ft)	0	290	#180	145	m#228	m#241	68	42	43
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	957	558	1524	347	355	1050	365	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.71	0.78	0.32	0.74	0.76	0.57	0.12	0.14

Intersection Summary

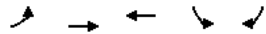
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel


2008 + Alternative D (Mitigated)
PM Peak



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1028	714	97	248
v/c Ratio	0.46	0.46	0.44	0.21	0.41
Control Delay	32.5	16.2	16.1	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	32.5	16.7	16.1	24.5	5.8
Queue Length 50th (ft)	59	220	121	38	0
Queue Length 95th (ft)	80	231	177	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1610	465	598
Starvation Cap Reductn	0	742	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.68	0.44	0.21	0.41
Intersection Summary					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	221	224	42	16	541	517	7	458	680
v/c Ratio	0.66	0.67	0.12	0.11	1.02	0.23	0.05	0.40	0.70
Control Delay	38.8	39.1	8.8	29.3	74.3	9.2	45.3	24.9	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	38.8	39.1	8.8	29.3	74.3	9.2	45.3	24.9	12.8
Queue Length 50th (ft)	108	109	0	5	~278	39	4	106	126
Queue Length 95th (ft)	169	171	23	23	#478	147	m5	#225	185
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2270	177	1139	970
Starvation Cap Reductn	0	0	0	0	0	0	0	0	53
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.51	0.09	0.09	1.02	0.23	0.04	0.40	0.74
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

13: Project Access & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak







	↖	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	202	62	876	441	667
v/c Ratio	0.53	0.16	0.73	0.38	0.56
Control Delay	22.6	6.5	13.0	1.7	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	6.5	13.0	1.7	8.6
Queue Length 50th (ft)	51	0	153	0	96
Queue Length 95th (ft)	110	23	#455	30	228
Internal Link Dist (ft)	306		2550		954
Turn Bay Length (ft)					
Base Capacity (vph)	500	492	1223	1190	1223
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.13	0.72	0.37	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	565	752	264	268	599
v/c Ratio	0.68	0.89	0.94	0.32	0.96	0.50
Control Delay	31.8	27.3	42.0	3.1	75.9	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	27.3	42.0	3.1	75.9	7.9
Queue Length 50th (ft)	96	72	281	0	108	110
Queue Length 95th (ft)	168	#252	#502	38	#242	179
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	662	796	827	280	1208
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.85	0.94	0.32	0.96	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	677	38	213	869	162	67	97	85	284	149
v/c Ratio	0.40	0.90	0.10	0.83	0.94	0.30	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	47.9	9.9	54.9	35.0	2.0	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	47.9	9.9	54.9	35.0	2.0	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	174	0	42	~262	0	16	8	0	118	13
Queue Length 95th (ft)	61	#273	23	m#76	m#359	m2	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	532	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.90	0.10	0.83	0.94	0.30	0.26	0.25	0.22	0.53	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	783	154	391	955	377	144	435	274	383	278	256
v/c Ratio	0.88	0.46	0.25	0.76	0.83	0.50	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	52.6	11.8	2.2	32.3	23.2	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	11.8	2.2	32.3	23.2	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	75	56	4	105	254	26	71	74	0	95	129	0
Queue Length 95th (ft)	m#168	m63	m7	#153	#330	37	#157	118	65	#188	#230	58
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1146	751	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.46	0.25	0.76	0.83	0.50	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1610	72	1342	209	25	370	370	369
v/c Ratio	0.69	0.51	0.67	0.13	0.05	0.84	0.88	0.66
Control Delay	8.7	43.9	20.3	0.2	9.8	43.2	48.5	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	43.9	20.3	0.2	9.8	43.2	48.5	26.4
Queue Length 50th (ft)	133	34	321	0	2	169	172	133
Queue Length 95th (ft)	170	m58	450	m0	18	#318	#329	224
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2321	142	2000	1583	568	475	455	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.51	0.67	0.13	0.04	0.78	0.81	0.62
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1724	287	1045	368	575	161	161	18
v/c Ratio	0.14	0.43	0.18	0.36	0.23	0.76	0.38	0.38	0.04
Control Delay	38.5	9.7	0.2	11.8	0.3	32.7	24.1	24.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	9.7	0.2	11.8	0.3	32.7	24.1	24.1	15.8
Queue Length 50th (ft)	10	166	0	81	0	135	67	67	5
Queue Length 95th (ft)	m13	m205	m0	181	0	163	104	104	18
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3973	1583	2898	1583	1415	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	103	0	0	0	0	33	33	34
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.45	0.18	0.36	0.23	0.41	0.21	0.21	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1205	574	148	999	226	475	236	107	242	193
v/c Ratio	0.59	0.88	0.55	0.89	0.58	0.74	0.76	0.48	0.47	0.50	0.49
Control Delay	40.6	34.1	8.8	88.1	23.9	49.9	42.1	8.2	40.4	37.4	9.8
Queue Delay	0.0	4.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	38.9	9.9	88.1	23.9	49.9	42.1	8.2	40.4	37.4	9.8
Queue Length 50th (ft)	74	309	103	80	150	126	132	0	59	67	0
Queue Length 95th (ft)	121	#478	214	#202	209	#258	#214	61	113	104	56
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	483	1369	1038	166	1719	310	641	495	296	624	449
Starvation Cap Reductn	0	116	237	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.96	0.72	0.89	0.58	0.73	0.74	0.48	0.36	0.39	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	285	338	520	114	257	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.48	0.95	0.81	0.18	1.44	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.2	66.8	32.8	4.5	255.3	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.2	66.8	32.8	4.5	255.3	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	~155	146	0
Queue Length 95th (ft)	#162	#221	#155	184	55	#296	#358	30	#287	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	600	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.47	0.95	0.81	0.18	1.44	0.79	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	↖	→	↙	←	↗	↘	↑	↖	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	848	56	954	351	51	91	511	132
v/c Ratio	0.67	0.69	0.47	0.89	0.59	0.43	0.44	0.80	0.18
Control Delay	64.2	32.3	37.9	30.5	7.6	52.2	21.8	35.9	5.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	32.4	37.9	30.5	7.6	52.2	21.8	35.9	5.8
Queue Length 50th (ft)	61	242	30	~323	4	28	14	237	10
Queue Length 95th (ft)	#161	#368	m55	#422	33	65	57	#388	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	159	1233	118	1077	592	118	367	653	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	22	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.70	0.47	0.89	0.59	0.43	0.25	0.78	0.17
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	↙	↖	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	536	104	1124	673	223
v/c Ratio	0.58	0.67	0.39	0.54	0.61	0.39
Control Delay	11.7	9.3	48.9	21.5	28.6	16.6
Queue Delay	0.2	0.7	0.0	0.5	0.0	0.0
Total Delay	11.9	10.0	48.9	22.0	28.6	16.6
Queue Length 50th (ft)	114	72	59	285	164	57
Queue Length 95th (ft)	142	m115	m99	351	222	119
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	797	295	2084	1106	568
Starvation Cap Reductn	145	74	0	479	0	0
Spillback Cap Reductn	11	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.74	0.35	0.70	0.61	0.39
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	546	248
v/c Ratio	0.63	0.27	0.70	0.66
Control Delay	4.4	6.4	36.7	36.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.5	6.4	36.7	36.0
Queue Length 50th (ft)	43	63	149	116
Queue Length 95th (ft)	246	115	181	176
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2424	2424	1221	580
Starvation Cap Reductn	64	0	0	0
Spillback Cap Reductn	0	99	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.28	0.45	0.43
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative D (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	9	220	20	815	21	122	667
v/c Ratio	0.09	0.03	0.49	0.10	0.43	0.02	0.42	0.29
Control Delay	13.7	17.2	7.5	23.8	10.3	5.2	22.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	17.2	7.5	23.8	10.3	5.2	22.4	5.5
Queue Length 50th (ft)	3	2	0	4	81	0	26	24
Queue Length 95th (ft)	19	12	44	22	152	10	78	107
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	525	562	644	203	2046	924	322	2428
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.34	0.10	0.40	0.02	0.38	0.27
Intersection Summary								

**CUMULATIVE 2020 + ALTERNATIVE D
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Flt		0.93			1.00	0.85		1.00		0.99	1.00	
Flt Protected		1.00			0.96	1.00		0.95		1.00	0.95	
Satd. Flow (prot)		1725			1785	1583		1770		1837	1770	1861
Flt Permitted		1.00			0.73	1.00		0.95		1.00	0.95	1.00
Satd. Flow (perm)		1725			1364	1583		1770		1837	1770	1861
Volume (vph)	0	13	16	143	22	134	14	736	74	186	508	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	14	17	151	23	141	15	775	78	196	535	3
RTOR Reduction (vph)	0	14	0	0	0	80	0	4	0	0	0	0
Lane Group Flow (vph)	0	17	0	0	174	61	15	849	0	196	538	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		13.3			13.3	13.3	0.9	44.0		9.8	52.9	
Effective Green, g (s)		13.8			13.8	13.8	1.4	44.5		10.3	53.4	
Actuated g/C Ratio		0.17			0.17	0.17	0.02	0.55		0.13	0.66	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		295			234	271	31	1014		226	1233	
v/s Ratio Prot		0.01					0.01	c0.46		c0.11	0.29	
v/s Ratio Perm					c0.13	0.04						
v/c Ratio		0.06			0.74	0.23	0.48	0.84		0.87	0.44	
Uniform Delay, d1		28.0			31.7	28.8	39.2	15.0		34.5	6.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			12.0	0.4	11.4	6.1		27.6	0.2	
Delay (s)		28.0			43.8	29.2	50.7	21.2		62.1	6.7	
Level of Service		C			D	C	D	C		E	A	
Approach Delay (s)		28.0			37.3			21.7			21.5	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		24.2										
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		80.6										
Intersection Capacity Utilization		79.3%										
Analysis Period (min)		15										
c Critical Lane Group												

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Flt		0.95			1.00			1.00		0.85	0.95	
Flt Protected		1.00			0.97			0.99		1.00	0.98	
Satd. Flow (prot)		1773			1810			1835		1583	1750	
Flt Permitted		0.98			0.70			0.92		1.00	0.91	
Satd. Flow (perm)		1736			1307			1718		1583	1624	
Volume (vph)	10	170	94	344	280	9	10	25	486	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	179	99	362	295	9	11	26	512	11	11	11
RTOR Reduction (vph)	0	27	0	0	1	0	0	0	408	0	9	0
Lane Group Flow (vph)	0	262	0	0	665	0	0	37	104	0	24	0
Turn Type	Perm			Perm		Perm		Perm		Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8				2		2		
Actuated Green, G (s)		28.1			28.1			8.8		8.8		8.8
Effective Green, g (s)		28.6			28.6			9.3		9.3		9.3
Actuated g/C Ratio		0.62			0.62			0.20		0.20		0.20
Clearance Time (s)		4.5			4.5			4.5		4.5		4.5
Vehicle Extension (s)		3.0			3.0			3.0		3.0		3.0
Lane Grp Cap (vph)		1082			814			348		321		329
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.51			0.02		c0.07		0.01
v/c Ratio		0.24			0.82			0.11		0.32		0.07
Uniform Delay, d1		3.8			6.6			14.9		15.6		14.8
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		0.1			6.4			0.1		0.6		0.1
Delay (s)		4.0			13.0			15.0		16.2		14.9
Level of Service		A			B			B		B		B
Approach Delay (s)		4.0			13.0			16.1				14.9
Approach LOS		A			B			B				B
Intersection Summary												
HCM Average Control Delay		12.5										
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		45.9										
Intersection Capacity Utilization		67.9%										
Analysis Period (min)		15										
c Critical Lane Group												

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	646	10	9	615	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	680	11	9	647	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	657			691			1393	1382	685	1393	1383	652
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	657			691			1393	1382	685	1393	1383	652
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			90	93	98	90	93	98
cM capacity (veh/h)	931			904			108	141	448	108	141	468
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	701	666	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	931	904	161	162								
Volume to Capacity	0.01	0.01	0.20	0.19								
Queue Length 95th (ft)	1	1	18	17								
Control Delay (s)	0.3	0.3	32.7	32.5								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.3	0.3	32.7	32.5								
Approach LOS			D	D								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization		50.3%		ICU Level of Service		A						
Analysis Period (min)		15										









4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	646	10	9	615	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	680	11	9	647	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)				1160								
pX, platoon unblocked	0.79						0.79	0.79		0.79	0.79	0.79
vC, conflicting volume	657			691			1388	1382	685	1388	1378	647
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	567			691			1490	1482	685	1490	1477	555
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			85	89	98	85	89	97
cM capacity (veh/h)	796			904			71	97	448	71	97	421
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	701	9	647	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	796	904	1700	1700	112	112						
Volume to Capacity	0.01	0.01	0.38	0.01	0.28	0.28						
Queue Length 95th (ft)	1	1	0	0	26	27						
Control Delay (s)	0.4	9.0	0.0	0.0	49.0	49.2						
Lane LOS	A	A			E	E						
Approach Delay (s)	0.4	0.1			49.0	49.2						
Approach LOS					E	E						
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization		52.6%		ICU Level of Service		A						
Analysis Period (min)		15										









5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Flt	1.00	0.99		1.00	0.96			1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3505		1770	3409			1795	1583	1770	1788	
Flt Permitted	0.95	1.00		0.95	1.00			0.75	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3505		1770	3409			1396	1583	1770	1788	
Volume (vph)	40	585	41	188	580	189	44	14	396	180	31	11
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	616	43	198	611	199	46	15	417	189	33	12
RTOR Reduction (vph)	0	4	0	0	24	0	0	0	372	0	8	0
Lane Group Flow (vph)	42	655	0	198	786	0	0	61	45	189	37	0
Turn Type	Prot			Prot			Perm		Perm	Prot		
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases							2		2			
Actuated Green, G (s)	4.9	38.1		19.2	52.4			10.4	10.4	14.3	29.2	
Effective Green, g (s)	5.4	38.6		19.7	52.9			10.9	10.9	14.8	29.7	
Actuated g/C Ratio	0.05	0.39		0.20	0.53			0.11	0.11	0.15	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	96	1353		349	1803			152	173	262	531	
v/s Ratio Prot	0.02	c0.19		c0.11	0.23					c0.11	0.02	
v/s Ratio Perm							c0.04	0.03				
v/c Ratio	0.44	0.48		0.57	0.44		0.40	0.26	0.72	0.07		
Uniform Delay, d1	45.8	23.2		36.3	14.4		41.5	40.9	40.6	25.2		
Progression Factor	1.00	1.00		0.73	0.60		1.00	1.00	0.99	0.97		
Incremental Delay, d2	3.2	1.2		1.8	0.6		1.7	0.8	9.4	0.1		
Delay (s)	49.0	24.4		28.2	9.3		43.2	41.7	49.5	24.6		
Level of Service	D	C		C	A		D	D	D	C		
Approach Delay (s)		25.9			13.0		41.9			44.7		
Approach LOS		C			B		D			D		
Intersection Summary												
HCM Average Control Delay		25.5			HCM Level of Service		C					
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)		16.0					
Intersection Capacity Utilization		62.0%			ICU Level of Service		B					
Analysis Period (min)		15										
c Critical Lane Group												

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.88	1.00	
Flt	1.00	0.96		1.00	0.96			1.00	1.00	0.85	1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	
Satd. Flow (prot)	1770	3409		3433	3390			1770	1863	2787	1770	1655
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3409		3433	3390			1770	1863	2787	1770	1655
Volume (vph)	53	835	273	509	695	273	143	105	559	217	41	119
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	879	287	536	732	287	151	111	588	228	43	125
RTOR Reduction (vph)	0	30	0	0	37	0	0	0	516	0	113	0
Lane Group Flow (vph)	56	1136	0	536	982	0	151	111	72	228	55	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8			5	2		1	6
Permitted Phases									2			
Actuated Green, G (s)	6.7	39.2		17.5	50.0			16.5	11.8	11.8	13.5	8.8
Effective Green, g (s)	7.2	39.7		18.0	50.5			17.0	12.3	12.3	14.0	9.3
Actuated g/C Ratio	0.07	0.40		0.18	0.50			0.17	0.12	0.12	0.14	0.09
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	127	1353		618	1712			301	229	343	248	154
v/s Ratio Prot	0.03	c0.33		c0.16	0.29			c0.09	0.06		c0.13	0.03
v/s Ratio Perm									0.03			
v/c Ratio	0.44	0.84		0.87	0.57		0.50	0.48	0.21	0.92	0.35	
Uniform Delay, d1	44.5	27.3		39.8	17.2		37.7	40.9	39.5	42.4	42.5	
Progression Factor	1.13	0.80		0.89	0.75		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	5.2		3.9	0.4		1.3	1.6	0.3	35.7	1.4	
Delay (s)	52.4	27.0		39.4	13.4		39.0	42.5	39.8	78.1	43.9	
Level of Service	D	C		D	B		D	D	D	E	D	
Approach Delay (s)		28.2			22.4			40.0			63.6	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		31.9			HCM Level of Service		C					
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)		12.0					
Intersection Capacity Utilization		77.2%			ICU Level of Service		D					
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	0.91	0.91	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	1863	1583	1610	3271	1583	3433	1649	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	1863	1583	1610	3271	1583	3433	1649	
Volume (vph)	153	1203	255	73	691	730	556	103	350	453	70	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	161	1266	268	77	727	768	585	108	368	477	74	242
RTOR Reduction (vph)	0	0	95	0	0	413	0	0	96	0	118	0
Lane Group Flow (vph)	161	1266	173	77	727	355	293	400	272	477	198	0
Turn Type	Prot	Perm	Prot	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases			4		8			2				
Actuated Green, G (s)	15.6	42.5	42.5	4.4	31.3	31.3	19.4	19.4	19.4	15.7	15.7	
Effective Green, g (s)	16.1	43.0	43.0	4.9	31.8	31.8	19.9	19.9	19.9	16.2	16.2	
Actuated g/C Ratio	0.16	0.43	0.43	0.05	0.32	0.32	0.20	0.20	0.20	0.16	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	285	1458	620	87	592	503	320	651	315	556	267	
v/s Ratio Prot	0.09	c0.37		c0.04	c0.39		c0.18	0.12		c0.14	0.12	
v/s Ratio Perm			0.12			0.22			0.17			
v/c Ratio	0.56	0.87	0.28	0.89	1.23	0.71	0.92	0.87dl	0.86	0.86	0.74	
Uniform Delay, d1	38.7	25.9	18.5	47.3	34.1	30.0	39.2	36.5	38.7	40.8	39.9	
Progression Factor	0.90	0.62	0.38	1.01	0.89	0.96	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	4.5	0.7	50.8	114.1	6.4	29.4	1.7	20.9	12.4	10.5	
Delay (s)	36.2	20.7	7.6	98.4	144.4	35.4	68.7	38.3	59.6	53.2	50.4	
Level of Service	D	C	A	F	F	D	E	D	E	D	D	
Approach Delay (s)		20.1			88.9			54.1			52.1	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM Average Control Delay		53.2										
HCM Volume to Capacity ratio		1.00										
Actuated Cycle Length (s)		100.0										
Intersection Capacity Utilization		91.4%										
Analysis Period (min)		15										
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												






















9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3041	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3041	
Volume (vph)	0	1398	611	77	858	0	0	0	0	355	288	633
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1472	643	81	903	0	0	0	0	374	303	666
RTOR Reduction (vph)	0	0	155	0	0	0	0	0	0	0	97	0
Lane Group Flow (vph)	0	1472	488	81	903	0	0	0	0	374	872	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases			4									
Actuated Green, G (s)		49.6	49.6	4.4	58.5					32.5	32.5	
Effective Green, g (s)		50.1	50.1	4.9	59.0					33.0	33.0	
Actuated g/C Ratio		0.50	0.50	0.05	0.59					0.33	0.33	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1773	793	168	2088					531	1004	
v/s Ratio Prot		c0.42		0.02	c0.26							
v/s Ratio Perm			0.31							0.23	0.29	
v/c Ratio		0.83	0.62	0.48	0.43					0.70	1.12dr	
Uniform Delay, d1		21.3	18.0	46.3	11.3					29.2	31.5	
Progression Factor		0.49	0.27	0.95	0.87					1.00	1.00	
Incremental Delay, d2		2.3	1.7	1.8	0.6					7.6	10.1	
Delay (s)		12.9	6.7	46.0	10.4					36.9	41.6	
Level of Service		B	A	D	B					D	D	
Approach Delay (s)		11.0			13.3				0.0		40.3	
Approach LOS		B			B				A		D	
Intersection Summary												
HCM Average Control Delay		20.3										
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		100.0										
Intersection Capacity Utilization		76.9%										
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												












10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	0.88	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	2787	3433	3520		1681	1691	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	2787	3433	3520		1681	1691	2787	1770	1723	
Volume (vph)	0	766	988	499	451	17	487	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	806	1040	525	475	18	513	19	601	9	9	9
RTOR Reduction (vph)	0	0	744	0	2	0	0	0	487	0	8	0
Lane Group Flow (vph)	0	806	296	525	491	0	259	273	114	9	10	0
Turn Type	Prot	Perm		Prot			Split	Perm		Split		
Protected Phases	7	4	3		8	2		2	6		6	
Permitted Phases			4			2		2				
Actuated Green, G (s)	28.0	28.0	19.5	52.0			18.5	18.5	18.5	16.0	16.0	
Effective Green, g (s)	28.5	28.5	20.0	52.5			19.0	19.0	19.0	16.5	16.5	
Actuated g/C Ratio	0.28	0.28	0.20	0.52			0.19	0.19	0.19	0.16	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1449	794	687	1848			319	321	530	292	284	
v/s Ratio Prot	c0.16			c0.15	0.14	0.15		c0.16	0.01		c0.01	
v/s Ratio Perm			0.11					0.04				
v/c Ratio	0.56	0.37	0.76	0.27			0.81	0.85	0.22	0.03	0.04	
Uniform Delay, d1	30.4	28.6	37.8	13.1			38.8	39.1	34.2	35.0	35.1	
Progression Factor	0.58	1.02	0.67	0.18			1.41	1.41	5.30	1.00	1.00	
Incremental Delay, d2	0.9	0.8	4.5	0.3			17.2	20.8	0.8	0.2	0.2	
Delay (s)	18.6	29.8	30.0	2.7			71.8	75.8	182.0	35.2	35.3	
Level of Service	B	C	C	A			E	E	F	D	D	
Approach Delay (s)	24.9			16.8			131.2			35.3		
Approach LOS	C			B			F			D		
Intersection Summary												
HCM Average Control Delay			52.9	HCM Level of Service				D				
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			100.0	Sum of lost time (s)				16.0				
Intersection Capacity Utilization			62.1%	ICU Level of Service				B				
Analysis Period (min)			15									
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1212	863	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1276	908	67	107	108
RTOR Reduction (vph)	0	0	4	0	0	83
Lane Group Flow (vph)	144	1276	971	0	107	25
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	9.4	68.0	54.1	23.0		
Effective Green, g (s)	9.9	68.5	54.6	23.5		
Actuated g/C Ratio	0.10	0.68	0.55	0.24		
Clearance Time (s)	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	340	2424	1913	416		
v/s Ratio Prot	0.04	c0.36	0.28	c0.06		
v/s Ratio Perm				0.02		
v/c Ratio	0.42	0.53	0.51	0.26		
Uniform Delay, d1	42.4	7.8	14.3	31.1		
Progression Factor	1.25	0.56	1.00	1.00		
Incremental Delay, d2	0.7	0.7	1.0	1.5		
Delay (s)	53.7	5.0	15.2	32.6		
Level of Service	D	A	B	C		
Approach Delay (s)	10.0		15.2	31.4		
Approach LOS	A		B	C		
Intersection Summary						
HCM Average Control Delay	13.7			HCM Level of Service		B
HCM Volume to Capacity ratio	0.46					
Actuated Cycle Length (s)	100.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	45.8%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	0.88
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	2787
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	2787
Volume (vph)	475	3	47	8	3	5	552	413	2	7	616	866
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	500	3	49	8	3	5	581	435	2	7	648	912
RTOR Reduction (vph)	0	0	42	0	5	0	0	0	0	0	0	305
Lane Group Flow (vph)	250	253	7	0	11	0	581	437	0	7	648	607
Turn Type	Split	Perm	Split		Prot		Prot		pm+ov			
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases			4									6
Actuated Green, G (s)	13.5	13.5	13.5		2.9		35.4	64.5		1.1	30.2	43.7
Effective Green, g (s)	14.0	14.0	14.0		3.4		35.9	65.0		1.6	30.7	44.7
Actuated g/C Ratio	0.14	0.14	0.14		0.03		0.36	0.65		0.02	0.31	0.45
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	236	222		59		635	2299		28	1086	1357
v/s Ratio Prot	0.15	c0.15			c0.01		c0.33	0.12		0.00	c0.18	0.06
v/s Ratio Perm			0.00									0.16
v/c Ratio	1.06	1.07	0.03		0.19		0.91	0.19		0.25	0.60	0.45
Uniform Delay, d1	43.0	43.0	37.1		47.0		30.6	7.0		48.6	29.4	19.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.15	0.61	0.53
Incremental Delay, d2	76.6	79.0	0.1		1.6		17.8	0.2		3.3	1.7	0.2
Delay (s)	119.6	122.0	37.2		48.5		48.4	7.2		59.0	19.6	10.2
Level of Service	F	F	D		D		D	A		E	B	B
Approach Delay (s)		113.4			48.5		30.7				14.3	
Approach LOS		F			D		C				B	
Intersection Summary												
HCM Average Control Delay		37.1			HCM Level of Service		D					
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)		16.0					
Intersection Capacity Utilization		77.5%			ICU Level of Service		D					
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↱	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583	1863	1583		1863
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1770	1583	1863	1583		1863
Volume (vph)	192	59	765	419	0	664
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	202	62	805	441	0	699
RTOR Reduction (vph)	0	48	0	164	0	0
Lane Group Flow (vph)	202	14	805	277	0	699
Turn Type	Perm		Perm			
Protected Phases	8		2			6
Permitted Phases		8		2		
Actuated Green, G (s)	11.3	11.3	33.1	33.1		33.1
Effective Green, g (s)	11.8	11.8	33.6	33.6		33.6
Actuated g/C Ratio	0.22	0.22	0.63	0.63		0.63
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	391	350	1172	996		1172
v/s Ratio Prot	c0.11		c0.43			0.38
v/s Ratio Perm		0.01		0.18		
v/c Ratio	0.52	0.04	0.69	0.28		0.60
Uniform Delay, d1	18.3	16.3	6.5	4.5		5.9
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	0.0	1.7	0.2		0.8
Delay (s)	19.4	16.4	8.2	4.6		6.7
Level of Service	B	B	A	A		A
Approach Delay (s)	18.7		6.9			6.7
Approach LOS	B		A			A
Intersection Summary						
HCM Average Control Delay		8.2		HCM Level of Service		A
HCM Volume to Capacity ratio		0.64				
Actuated Cycle Length (s)		53.4		Sum of lost time (s)		8.0
Intersection Capacity Utilization		57.6%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↩	↩	↩	↩	↩	↩
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	144	31	12	359	363	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	152	33	13	378	382	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	609	204	408			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609	204	408			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	96	99			
cM capacity (veh/h)	422	803	1147			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	152	33	13	189	189	255 154
Volume Left	152	0	13	0	0	0 0
Volume Right	0	33	0	0	0	0 26
cSH	422	803	1147	1700	1700	1700 1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15 0.09
Queue Length 95th (ft)	40	3	1	0	0	0 0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0 0.0
Lane LOS	C	A	A			
Approach Delay (s)	16.7		0.3			0.0
Approach LOS	C					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			25.5%		ICU Level of Service	A
Analysis Period (min)			15			

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↩	↩	↩	↩	↩	↩
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	468	715	253	248	608
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	493	753	266	261	640
RTOR Reduction (vph)	0	282	0	151	0	0
Lane Group Flow (vph)	266	211	753	115	261	640
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	13.3	13.3	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.8	13.8	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	803	682	281	1217
v/s Ratio Prot	c0.15		c0.40		c0.15	0.34
v/s Ratio Perm		0.13		0.07		
v/c Ratio	0.69	0.61	0.94	0.17	0.93	0.53
Uniform Delay, d1	22.6	22.1	17.1	11.0	26.1	5.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	3.0	19.8	0.5	34.9	1.6
Delay (s)	27.5	25.1	36.9	11.5	61.0	7.4
Level of Service	C	C	D	B	E	A
Approach Delay (s)	26.0		30.3			22.9
Approach LOS	C		C			C
Intersection Summary						
HCM Average Control Delay			26.6		HCM Level of Service	C
HCM Volume to Capacity ratio			0.87			
Actuated Cycle Length (s)			62.9		Sum of lost time (s)	12.0
Intersection Capacity Utilization			75.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	0.95	0.95	0.95
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.93	0.93
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	0.98
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1681	1620	1620
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	0.98
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1681	1620	1620
Volume (vph)	83	628	53	116	743	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	661	56	122	782	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	41	0	0	71	0	54	67	0	37	0
Lane Group Flow (vph)	87	661	15	122	782	26	73	45	22	215	188	0
Turn Type	Prot	Perm	Prot	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases			4		8			2				
Actuated Green, G (s)	5.2	21.6	21.6	4.4	20.8	20.8	19.5	19.5	19.5	16.5	16.5	
Effective Green, g (s)	5.7	22.1	22.1	4.9	21.3	21.3	20.0	20.0	20.0	17.0	17.0	
Actuated g/C Ratio	0.07	0.28	0.28	0.06	0.27	0.27	0.25	0.25	0.25	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	126	978	437	210	942	421	858	394	376	357	344	
v/s Ratio Prot	0.05	c0.19		0.04	c0.22		0.02	c0.03		c0.13	0.12	
v/s Ratio Perm			0.01			0.02			0.01			
v/c Ratio	0.69	0.68	0.04	0.58	0.83	0.06	0.09	0.11	0.06	0.60	0.55	
Uniform Delay, d1	36.3	25.8	21.2	36.6	27.6	21.9	23.0	23.2	22.8	28.4	28.1	
Progression Factor	1.00	1.00	1.00	1.24	0.48	0.28	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.1	1.9	0.0	2.6	4.2	0.0	0.2	0.6	0.3	7.3	6.1	
Delay (s)	51.4	27.6	21.2	48.1	17.4	6.1	23.2	23.7	23.1	35.8	34.2	
Level of Service	D	C	C	D	B	A	C	C	C	D	C	
Approach Delay (s)		29.7			20.1			23.4			35.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay		26.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		54.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												


























18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Volume (vph)	216	743	163	377	854	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	782	172	397	899	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	69	267	0	0	198
Lane Group Flow (vph)	227	782	57	397	899	108	182	443	101	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8	5	2		1	6		
Permitted Phases			4		8			2				6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.15		0.12	c0.25		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.47	0.11	0.77	0.79	0.21	0.87	0.71	0.36	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.3	18.7	32.7	24.7	19.8	34.6	30.1	28.0	34.0	30.7	26.3
Progression Factor	0.63	0.68	0.66	0.83	0.79	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.1	0.8	0.4	5.5	4.4	0.7	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	34.6	15.2	12.8	32.7	24.0	16.1	63.7	33.8	28.8	45.1	46.1	26.5
Level of Service	C	B	B	C	C	B	E	C	C	D	D	C
Approach Delay (s)		18.6			24.5			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		28.9			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												





























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.97		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4926		1770	3539	1583		1653		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.92		0.74	0.71	1.00
Satd. Flow (perm)		4926		1770	3539	1583		1548		1312	1255	1583
Volume (vph)	0	1259	333	68	1113	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1325	351	72	1172	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	54	0	0	0	0	0	12	0	0	0	41
Lane Group Flow (vph)	0	1622	0	72	1172	268	0	12	0	322	322	408
Turn Type	Prot			Free			Perm			Perm		
Protected Phases	4			3			2			6		
Permitted Phases				Free			2			6		
Actuated Green, G (s)	37.0			5.0			24.5			24.5		
Effective Green, g (s)	37.5			5.5			25.0			25.0		
Actuated g/C Ratio	0.47			0.07			0.31			0.31		
Clearance Time (s)	4.5			4.5			4.5			4.5		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	2309			122			2079			1583		
v/s Ratio Prot	c0.33			0.04			c0.33					
v/s Ratio Perm				0.17			0.01			0.25		
v/c Ratio	0.70			0.59			0.56			0.17		
Uniform Delay, d1	16.8			36.2			10.2			0.0		
Progression Factor	0.47			0.87			1.52			1.00		
Incremental Delay, d2	1.4			6.6			1.0			0.2		
Delay (s)	9.3			37.9			16.5			0.2		
Level of Service	A			D			B			C		
Approach Delay (s)	9.3			14.6			19.1			36.4		
Approach LOS	A			B			B			D		
Intersection Summary												
HCM Average Control Delay	18.1			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.75											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	70.5%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.81	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1469	
Volume (vph)	21	1563	298	0	849	383	582	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1645	314	0	894	403	613	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	22	1645	314	0	894	403	613	180	181	0	16	0
Turn Type	Prot		Free		Free		Perm		Perm		Perm	
Protected Phases	7		4		8		2				6	
Permitted Phases			Free		Free		2		2		6	
Actuated Green, G (s)	2.2	48.0	80.0		41.3	80.0	23.0	23.0	23.0		23.0	
Effective Green, g (s)	2.7	48.5	80.0		41.8	80.0	23.5	23.5	23.5		23.5	
Actuated g/C Ratio	0.03	0.61	1.00		0.52	1.00	0.29	0.29	0.29		0.29	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	3885	1583		2657	1583	792	442	442		432	
v/s Ratio Prot	0.01	c0.26			0.18			0.12				
v/s Ratio Perm			0.20			0.25	c0.23		0.12			0.01
v/c Ratio	0.37	0.42	0.20		0.34	0.25	0.77	0.41	0.41		0.04	
Uniform Delay, d1	37.8	8.3	0.0		11.1	0.0	25.8	22.7	22.7		20.2	
Progression Factor	1.11	1.21	1.00		1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.6	0.2	0.2		0.3	0.4	4.7	0.6	0.6		0.0	
Delay (s)	44.4	10.3	0.2		11.4	0.4	30.6	23.3	23.3		20.2	
Level of Service	D	B	A		B	A	C	C	C		C	
Approach Delay (s)	9.1				8.0			27.9			20.2	
Approach LOS	A				A			C			C	
Intersection Summary												
HCM Average Control Delay			13.1	HCM Level of Service				B				
HCM Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			80.0	Sum of lost time (s)				8.0				
Intersection Capacity Utilization			50.2%	ICU Level of Service				A				
Analysis Period (min)			15									
c Critical Lane Group												




























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	4912		1610	3330	1583	1610	3387	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	4912		1610	3330	1583	1610	3387	1583
Volume (vph)	235	1228	462	165	690	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1293	486	174	726	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	39	0	58	0	0	0	208	0	0	133
Lane Group Flow (vph)	247	1293	447	174	881	0	229	483	46	180	381	27
Turn Type	Prot		pm+ov	Prot			Split		Perm	Split		Perm
Protected Phases	7	4	2	3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	10.5	31.5	47.0	8.5	29.5		15.5	15.5	15.5	14.3	14.3	14.3
Effective Green, g (s)	11.0	32.0	48.0	9.0	30.0		16.0	16.0	16.0	14.8	14.8	14.8
Actuated g/C Ratio	0.13	0.36	0.55	0.10	0.34		0.18	0.18	0.18	0.17	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	430	1853	938	181	1678		293	607	288	271	571	267
v/s Ratio Prot	0.07	c0.25	0.09	c0.10	0.18		0.14	c0.15		0.11	c0.11	
v/s Ratio Perm			0.20						0.03			0.02
v/c Ratio	0.57	0.70	0.48	0.96	0.53		0.78	0.80	0.16	0.66	0.67	0.10
Uniform Delay, d1	36.2	23.8	12.2	39.2	23.2		34.2	34.3	30.2	34.2	34.2	30.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	2.2	0.4	55.3	1.2		12.7	7.1	0.3	6.0	3.0	0.2
Delay (s)	38.1	26.0	12.6	94.6	24.4		46.9	41.5	30.5	40.2	37.1	31.0
Level of Service	D	C	B	F	C		D	D	C	D	D	C
Approach Delay (s)		24.2			35.3			39.9			36.5	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay	31.8			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.75											
Actuated Cycle Length (s)	87.8			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	69.0%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												












22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3390	1441	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3390	1441	1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	149	583	228	140	661	281	323	483	113	255	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	296	340	508	119	268	377	247
RTOR Reduction (vph)	0	0	187	0	0	227	0	0	81	0	0	178
Lane Group Flow (vph)	157	614	53	147	696	69	340	508	38	268	377	69
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.4	19.4	19.4	9.3	19.3	19.3	18.3	28.5	28.5	14.5	24.7	24.7
Effective Green, g (s)	9.9	19.9	19.9	9.8	19.8	19.8	18.8	29.0	29.0	15.0	25.2	25.2
Actuated g/C Ratio	0.11	0.22	0.22	0.11	0.22	0.22	0.21	0.32	0.32	0.17	0.28	0.28
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	195	752	320	193	781	349	371	602	512	296	523	445
v/s Ratio Prot	c0.09	0.18		0.08	c0.20		c0.19	c0.27		0.15	0.20	
v/s Ratio Perm			0.04			0.04			0.02			0.04
v/c Ratio	0.81	0.82	0.17	0.76	0.89	0.20	0.92	0.84	0.08	0.91	0.72	0.16
Uniform Delay, d1	39.0	33.2	28.2	38.8	33.9	28.5	34.7	28.2	21.0	36.7	29.1	24.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.9	6.8	0.2	16.2	12.4	0.3	26.7	13.5	0.3	29.1	8.3	0.7
Delay (s)	59.9	40.0	28.4	55.0	46.3	28.8	61.3	41.8	21.3	65.7	37.4	25.0
Level of Service	E	D	C	D	D	C	E	D	C	E	D	C
Approach Delay (s)		40.4			42.9			46.1			42.5	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay	42.9			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	89.7			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	79.4%			ICU Level of Service					D			
Analysis Period (min)	15											
c Critical Lane Group												








23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Flt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3520		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3520		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	856	32	53	965	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	901	34	56	1016	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	3	0	0	0	105	0	58	0	0	73	0
Lane Group Flow (vph)	128	932	0	56	1016	322	51	33	0	623	72	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.5	36.3		4.3	33.1	33.1	5.8	6.5		36.7	37.4	
Effective Green, g (s)	8.0	36.8		4.8	33.6	33.6	6.3	7.0		37.2	37.9	
Actuated g/C Ratio	0.08	0.36		0.05	0.33	0.33	0.06	0.07		0.37	0.37	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	1272		83	1168	522	110	115		647	610	
v/s Ratio Prot	c0.07	0.26		0.03	c0.29		c0.03	0.02		c0.35	0.04	
v/s Ratio Perm						0.20						
v/c Ratio	0.92	0.73		0.67	0.87	0.62	0.46	0.29		0.96	0.12	
Uniform Delay, d1	46.6	28.2		47.7	32.0	28.7	46.1	45.0		31.6	21.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.9	3.8		19.5	8.9	5.4	3.1	1.4		26.3	0.1	
Delay (s)	99.5	32.0		67.3	41.0	34.1	49.2	46.4		57.9	21.1	
Level of Service	F	C		E	D	C	D	D		E	C	
Approach Delay (s)		40.1			40.0			47.4			50.9	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay		42.8							D			
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		101.8						16.0				
Intersection Capacity Utilization		83.3%							E			
Analysis Period (min)		15										
c Critical Lane Group												











24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						0.97	1.00
Flt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539						3433	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1583	1770	3539						3433	1583
Volume (vph)	0	953	560	66	1166	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	589	69	1227	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	127	0	0	0	0	0	0	0	46	0
Lane Group Flow (vph)	0	1003	462	69	1227	0	0	0	0	674	226	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		0.28		0.04	c0.35					c0.20	0.14	
v/s Ratio Perm			c0.29									
v/c Ratio		0.69	0.71	0.29	0.59					0.61	0.44	
Uniform Delay, d1		21.9	22.1	35.1	11.6					25.7	24.1	
Progression Factor		1.00	1.00	1.28	1.72					1.00	1.00	
Incremental Delay, d2		2.7	6.5	0.6	1.1					1.0	2.8	
Delay (s)		24.6	28.7	45.3	21.1					26.7	26.9	
Level of Service		C	C	D	C					C	C	
Approach Delay (s)		26.1			22.4				0.0		26.7	
Approach LOS		C			C				A		C	
Intersection Summary												
HCM Average Control Delay			25.0							C		
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			90.0							8.0		
Intersection Capacity Utilization			67.7%							C		
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	543	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	572	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	572	273
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	59.3			59.3	21.7	21.7
Effective Green, g (s)	59.8			59.8	22.2	22.2
Actuated g/C Ratio	0.66			0.66	0.25	0.25
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2351			2351	847	390
v/s Ratio Prot	c0.47			0.20	0.17	
v/s Ratio Perm				c0.17		
v/c Ratio	0.71			0.31	0.68	0.70
Uniform Delay, d1	9.6			6.4	30.6	30.9
Progression Factor	0.40			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.3	2.1	5.6
Delay (s)	5.3			6.7	32.8	36.5
Level of Service	A			A	C	D
Approach Delay (s)	5.3			6.7	34.0	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			13.2	HCM Level of Service		B
HCM Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			67.7%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1741			1819	1583	1770	3539	1583	1770	3534	
Flt Permitted		0.84			0.84	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1502			1560	1583	1770	3539	1583	1770	3534	
Volume (vph)	11	5	8	23	25	234	7	787	26	132	669	7
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	5	8	24	26	246	7	828	27	139	704	7
RTOR Reduction (vph)	0	7	0	0	0	214	0	0	13	0	1	0
Lane Group Flow (vph)	0	18	0	0	50	32	7	828	14	139	710	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		6.4			6.4	6.4	1.0	25.9	25.9	6.7	31.6	
Effective Green, g (s)		6.9			6.9	6.9	1.5	26.4	26.4	7.2	32.1	
Actuated g/C Ratio		0.13			0.13	0.13	0.03	0.50	0.50	0.14	0.61	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		197			205	208	51	1780	796	243	2161	
v/s Ratio Prot							0.00	c0.23		c0.08	0.20	
v/s Ratio Perm	0.01				c0.03	0.02			0.01			
v/c Ratio	0.09				0.24	0.16	0.14	0.47	0.02	0.57	0.33	
Uniform Delay, d1	20.0				20.5	20.2	24.9	8.5	6.5	21.2	5.0	
Progression Factor	1.00				1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2				0.6	0.4	1.2	0.2	0.0	3.2	0.1	
Delay (s)	20.2				21.1	20.6	26.1	8.7	6.6	24.4	5.0	
Level of Service	C				C	C	C	A	A	C	A	
Approach Delay (s)	20.2				20.7			8.7			8.2	
Approach LOS	C				C			A			A	
Intersection Summary												
HCM Average Control Delay	10.4			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.45											
Actuated Cycle Length (s)	52.5			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	49.6%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	265	2	16	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	17	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	19	1								
Volume Left	1	7	17	0								
Volume Right	5	2	2	0								
cSH	1281	1402	526	488								
Volume to Capacity	0.00	0.01	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.1	0.2	12.1	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	12.1	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization		33.2%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel











2020 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	↕
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								None			None		
Median storage veh													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	237				193			493	493	181	521	505	237
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	237				193			493	493	181	521	505	237
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100				97			75	100	97	100	100	100
cM capacity (veh/h)	1330				1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	193	275	147	0									
Volume Left	0	38	120	0									
Volume Right	24	0	27	0									
cSH	1330	1381	519	1700									
Volume to Capacity	0.00	0.03	0.28	0.00									
Queue Length 95th (ft)	0	2	29	0									
Control Delay (s)	0.0	1.3	14.7	0.0									
Lane LOS		A	B	A									
Approach Delay (s)	0.0	1.3	14.7	0.0									
Approach LOS			B	A									
Intersection Summary													
Average Delay			4.1										
Intersection Capacity Utilization		41.6%			ICU Level of Service				A				
Analysis Period (min)		15											

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	174	141	15	853	196	538
v/c Ratio	0.10	0.71	0.39	0.12	0.88	0.83	0.42
Control Delay	19.6	49.0	15.7	43.5	27.8	66.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	49.0	15.7	43.5	27.8	66.1	7.3
Queue Length 50th (ft)	6	83	19	7	356	102	97
Queue Length 95th (ft)	30	#181	74	28	545	#251	226
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	385	294	416	127	1082	237	1320
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.59	0.34	0.12	0.79	0.83	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	←	↑	↖	↓
Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	289	666	37	512	33
v/c Ratio	0.26	0.84	0.10	0.70	0.10
Control Delay	4.2	20.8	17.0	8.0	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	20.8	17.0	8.0	13.6
Queue Length 50th (ft)	15	85	9	0	6
Queue Length 95th (ft)	68	#417	28	60	22
Internal Link Dist (ft)	1130	2170	446		2150
Turn Bay Length (ft)					
Base Capacity (vph)	1174	855	588	870	565
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.25	0.78	0.06	0.59	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.










5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	↗	→	↖	←	↑	↘	↙	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	659	198	810	61	417	189	45
v/c Ratio	0.30	0.47	0.62	0.43	0.38	0.77	0.72	0.08
Control Delay	49.1	24.6	35.5	9.7	46.1	14.0	55.7	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	24.6	35.5	9.7	46.1	14.0	55.7	17.1
Queue Length 50th (ft)	26	157	112	97	37	0	113	15
Queue Length 95th (ft)	60	251	167	127	70	85	m181	m32
Internal Link Dist (ft)		1080		1070	911			2200
Turn Bay Length (ft)	150		150					
Base Capacity (vph)	138	1415	319	1885	325	674	301	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.47	0.62	0.43	0.19	0.62	0.63	0.06
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	56	1166	536	1019	151	111	588	228	168
v/c Ratio	0.38	0.82	0.92	0.57	0.50	0.49	0.69	0.92	0.63
Control Delay	55.4	26.1	45.5	13.1	44.2	47.2	7.8	83.7	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	26.1	45.5	13.1	44.2	47.2	7.8	83.7	24.0
Queue Length 50th (ft)	35	209	179	146	87	67	0	145	26
Queue Length 95th (ft)	m62	#472	m188	m177	154	116	50	#287	86
Internal Link Dist (ft)		1070		550		687			2220
Turn Bay Length (ft)	150		150						
Base Capacity (vph)	155	1417	584	1782	300	317	962	248	416
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.82	0.92	0.57	0.50	0.35	0.61	0.92	0.40
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	161	1266	268	77	727	768	293	400	368	477	316
v/c Ratio	0.60	0.85	0.37	0.73	1.19	0.83	0.91	0.87dl	0.89	0.86	0.82
Control Delay	41.1	21.0	3.8	76.7	129.5	14.3	73.0	41.2	51.8	57.0	40.5
Queue Delay	0.0	3.2	0.0	0.0	57.5	0.9	0.0	0.0	1.3	4.3	0.0
Total Delay	41.1	24.1	3.8	76.7	187.0	15.2	73.0	41.2	53.1	61.3	40.5
Queue Length 50th (ft)	105	334	13	49	~608	80	202	128	160	153	109
Queue Length 95th (ft)	m138	m#546	m19	m#93	m#802	m#373	#373	181	#329	#234	#249
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	294	1487	725	106	609	925	322	654	413	566	390
Starvation Cap Reductn	0	0	0	0	60	37	0	0	0	0	0
Spillback Cap Reductn	0	139	0	0	0	0	0	0	7	45	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.94	0.37	0.73	1.32	0.86	0.91	0.61	0.91	0.92	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↖	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	1472	643	81	903	374	969	
v/c Ratio	0.82	0.67	0.39	0.43	0.70	1.12dr	
Control Delay	12.9	4.5	48.1	10.5	37.7	37.5	
Queue Delay	16.9	2.6	0.0	0.1	0.0	49.6	
Total Delay	29.8	7.1	48.1	10.6	37.7	87.1	
Queue Length 50th (ft)	212	62	26	215	226	276	
Queue Length 95th (ft)	m361	m94	m39	m262	346	#401	
Internal Link Dist (ft)	220			466		348	
Turn Bay Length (ft)			300		250		
Base Capacity (vph)	1805	959	206	2088	531	1101	
Starvation Cap Reductn	361	200	0	0	0	0	
Spillback Cap Reductn	0	0	0	162	0	224	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.02	0.85	0.39	0.47	0.70	1.10	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	806	1040	525	493	259	273	601	9	18
v/c Ratio	0.56	0.68	0.76	0.27	0.81	0.85	0.59	0.03	0.06
Control Delay	18.7	3.4	33.0	2.7	72.3	76.1	18.7	35.6	25.1
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	3.7	33.0	2.7	72.3	76.1	18.7	35.6	25.1
Queue Length 50th (ft)	120	42	163	10	174	185	72	5	5
Queue Length 95th (ft)	158	42	223	19	m218	m#242	m84	19	25
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1449	1538	687	1851	319	321	1016	292	292
Starvation Cap Reductn	0	128	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.74	0.76	0.27	0.81	0.85	0.59	0.03	0.06
Intersection Summary									
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m	Volume for 95th percentile queue is metered by upstream signal.								










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	↘	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1276	975	107	108
v/c Ratio	0.43	0.53	0.51	0.26	0.24
Control Delay	55.7	5.1	15.5	33.2	7.6
Queue Delay	0.0	0.2	0.0	0.0	0.0
Total Delay	55.7	5.3	15.5	33.2	7.6
Queue Length 50th (ft)	49	64	192	56	0
Queue Length 95th (ft)	80	111	262	103	42
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	755	2424	1919	416	455
Starvation Cap Reductn	0	409	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.63	0.51	0.26	0.24
Intersection Summary					






12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	253	49	16	581	437	7	648	912
v/c Ratio	1.06	1.07	0.19	0.13	0.91	0.17	0.06	0.55	0.54
Control Delay	119.3	121.4	13.1	37.5	50.8	6.1	51.7	19.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	119.3	121.4	13.1	37.5	50.8	6.1	51.7	19.7	4.8
Queue Length 50th (ft)	~186	~189	0	7	332	28	5	128	61
Queue Length 95th (ft)	#347	#352	33	28	#523	96	m7	237	112
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	235	236	264	144	693	2523	110	1184	1702
Starvation Cap Reductn	0	0	0	0	0	0	0	0	226
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.07	0.19	0.11	0.84	0.17	0.06	0.55	0.62
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

					
Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	202	62	805	441	699
v/c Ratio	0.52	0.16	0.69	0.38	0.60
Control Delay	21.3	6.5	11.3	1.7	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	6.5	11.3	1.7	9.4
Queue Length 50th (ft)	44	0	127	0	99
Queue Length 95th (ft)	110	23	318	30	247
Internal Link Dist (ft)	306		2550		954
Turn Bay Length (ft)					
Base Capacity (vph)	521	509	1223	1190	1223
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.39	0.12	0.66	0.37	0.57
Intersection Summary					

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	493	753	266	261	640
v/c Ratio	0.68	0.78	0.94	0.32	0.93	0.53
Control Delay	32.2	16.9	41.0	3.1	69.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	16.9	41.0	3.1	69.1	8.2
Queue Length 50th (ft)	94	43	281	0	104	122
Queue Length 95th (ft)	164	#182	#503	38	#235	198
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	662	801	832	282	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.74	0.94	0.32	0.93	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak


	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	661	56	122	782	97	73	99	89	215	225
v/c Ratio	0.57	0.68	0.12	0.47	0.83	0.20	0.08	0.21	0.19	0.60	0.59
Control Delay	51.1	29.5	7.1	48.6	19.4	2.1	25.0	11.4	7.4	36.5	29.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	29.5	7.1	48.6	19.4	2.1	25.0	11.4	7.4	36.5	29.5
Queue Length 50th (ft)	43	151	0	27	65	1	14	11	0	103	84
Queue Length 95th (ft)	#99	208	26	m39	m151	m2	31	51	36	176	160
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	155	1017	495	257	973	506	895	465	458	357	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.65	0.11	0.47	0.80	0.19	0.08	0.21	0.19	0.60	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	782	172	397	899	335	182	512	368	357	317	248
v/c Ratio	0.81	0.47	0.27	0.77	0.79	0.46	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	41.9	15.4	3.3	36.6	25.0	3.8	73.5	31.9	11.9	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	15.4	3.3	36.6	25.0	3.8	73.5	31.9	11.9	51.7	51.3	7.3
Queue Length 50th (ft)	79	90	5	107	244	28	92	108	16	92	151	0
Queue Length 95th (ft) m#200	109	m15	m#156	m287	m30	#210	163	106	#172	#279	57	
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1133	734	210	752	567	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.47	0.27	0.77	0.79	0.46	0.87	0.68	0.65	0.81	0.80	0.47

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1676	72	1172	268	24	322	322	449
v/c Ratio	0.69	0.49	0.56	0.17	0.05	0.78	0.82	0.84
Control Delay	9.3	42.0	18.2	0.2	9.5	38.5	42.5	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	42.0	18.2	0.2	9.5	38.5	42.5	36.4
Queue Length 50th (ft)	145	32	273	0	2	143	146	171
Queue Length 95th (ft)	183	m59	385	m0	17	238	#267	#284
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2415	147	2077	1583	576	476	455	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.49	0.56	0.17	0.04	0.68	0.71	0.73

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1645	314	894	403	613	181	182	18
v/c Ratio	0.17	0.42	0.20	0.32	0.25	0.77	0.41	0.41	0.04
Control Delay	40.7	11.4	0.2	12.0	0.4	32.4	23.9	23.9	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	11.4	0.2	12.0	0.4	32.4	23.9	23.9	15.1
Queue Length 50th (ft)	12	169	0	69	0	144	75	75	5
Queue Length 95th (ft)	m16	215	m0	157	0	170	112	113	17
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	3888	1583	2831	1583	1415	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	5	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.42	0.20	0.32	0.25	0.43	0.23	0.23	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1293	486	174	939	229	483	254	180	381	160
v/c Ratio	0.57	0.70	0.50	0.96	0.54	0.78	0.80	0.51	0.66	0.67	0.40
Control Delay	42.6	26.6	10.7	99.8	22.7	54.4	45.7	8.4	47.0	40.6	8.8
Queue Delay	0.0	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	26.8	11.7	99.8	22.7	54.4	45.7	8.4	47.0	40.6	8.8
Queue Length 50th (ft)	69	229	121	101	142	137	145	0	104	110	0
Queue Length 95th (ft)	108	281	200	#229	184	#261	#220	63	181	160	52
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	430	1853	962	181	1736	301	622	503	297	624	422
Starvation Cap Reductn	0	94	239	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.74	0.67	0.96	0.54	0.76	0.78	0.50	0.61	0.61	0.38
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	614	240	147	696	296	340	508	119	268	377	247
v/c Ratio	0.80	0.82	0.47	0.76	0.89	0.51	0.92	0.84	0.20	0.91	0.72	0.40
Control Delay	68.9	43.5	7.6	64.6	49.8	7.5	66.5	43.1	5.3	71.5	38.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.9	43.5	7.6	64.6	49.8	7.5	66.5	43.1	5.3	71.5	38.3	5.6
Queue Length 50th (ft)	89	182	0	82	202	2	190	267	0	151	194	0
Queue Length 95th (ft)	#191	#268	64	#177	#301	67	#349	#440	36	#295	#299	55
Internal Link Dist (ft)		689			6630			734			980	
Turn Bay Length (ft)	350		450	500		150	550		675	500		625
Base Capacity (vph)	198	755	508	197	787	578	374	603	593	296	525	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.81	0.47	0.75	0.88	0.51	0.91	0.84	0.20	0.91	0.72	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT			
Lane Group Flow (vph)	128	935	56	1016	427	51	91	623	145			
v/c Ratio	0.90	0.72	0.54	0.88	0.69	0.39	0.47	0.95	0.21			
Control Delay	101.2	32.5	66.7	42.7	25.5	54.7	26.4	56.8	7.0			
Queue Delay	0.0	0.2	0.0	4.9	0.1	0.0	0.1	0.2	0.0			
Total Delay	101.2	32.7	66.7	47.6	25.6	54.7	26.4	57.0	7.0			
Queue Length 50th (ft)	84	281	36	326	153	32	18	389	12			
Queue Length 95th (ft)	#207	382	#92	#481	285	73	67	#661	52			
Internal Link Dist (ft)		6630		350			200		236			
Turn Bay Length (ft)	225		150		80	50		225				
Base Capacity (vph)	142	1302	104	1156	622	139	304	658	762			
Starvation Cap Reductn	0	0	0	95	7	0	0	0	0			
Spillback Cap Reductn	0	39	0	0	0	0	9	1	0			
Storage Cap Reductn	0	0	0	0	0	0	0	0	0			
Reduced v/c Ratio	0.90	0.74	0.54	0.96	0.69	0.37	0.31	0.95	0.19			

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	589	69	1227	674	272
v/c Ratio	0.67	0.75	0.27	0.59	0.61	0.49
Control Delay	25.3	22.2	44.5	21.5	28.6	21.6
Queue Delay	0.4	0.3	0.0	0.5	0.0	0.3
Total Delay	25.8	22.4	44.5	22.0	28.6	21.9
Queue Length 50th (ft)	256	193	38	317	164	91
Queue Length 95th (ft)	331	#384	m70	386	222	166
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	790	295	2084	1106	556
Starvation Cap Reductn	149	22	0	389	0	0
Spillback Cap Reductn	63	0	0	181	0	53
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.77	0.23	0.72	0.61	0.54

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	572	287
v/c Ratio	0.71	0.31	0.67	0.71
Control Delay	6.0	7.7	34.1	38.0
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	6.1	7.7	34.1	38.0
Queue Length 50th (ft)	192	78	153	141
Queue Length 95th (ft)	250	146	177	197
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2351	2351	1221	574
Starvation Cap Reductn	60	0	0	0
Spillback Cap Reductn	0	178	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.33	0.47	0.50

Intersection Summary

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative D (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	50	246	7	828	27	139	711
v/c Ratio	0.09	0.19	0.53	0.04	0.46	0.03	0.47	0.29
Control Delay	15.2	19.0	7.9	23.3	11.8	4.9	23.8	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	19.0	7.9	23.3	11.8	4.9	23.8	5.5
Queue Length 50th (ft)	4	11	0	2	87	0	31	30
Queue Length 95th (ft)	20	36	47	12	156	12	88	116
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	479	487	637	191	1927	874	321	2421
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.10	0.39	0.04	0.43	0.03	0.43	0.29
Intersection Summary								

**NEAR-TERM 2008 + ALTERNATIVE E
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flt		0.91			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1783	1583	1770	1843		1770	1861	
Flt Permitted		1.00			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1699			1366	1583	1770	1843		1770	1861	
Volume (vph)	0	8	14	106	13	97	12	795	62	91	514	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	15	112	14	102	13	837	65	96	541	3
RTOR Reduction (vph)	0	13	0	0	0	86	0	3	0	0	0	0
Lane Group Flow (vph)	0	10	0	0	126	16	13	899	0	96	544	0
Turn Type	Perm			Perm	Perm	Prot		Prot				
Protected Phases		4			8	5	2			1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		11.7			11.7	11.7	1.0	47.3		4.6	50.9	
Effective Green, g (s)		12.2			12.2	12.2	1.5	47.8		5.1	51.4	
Actuated g/C Ratio		0.16			0.16	0.16	0.02	0.62		0.07	0.67	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		269			216	250	34	1143		117	1241	
v/s Ratio Prot		0.01					0.01	c0.49		c0.05	c0.29	
v/s Ratio Perm					c0.09	0.01						
v/c Ratio		0.04			0.58	0.06	0.38	0.79		0.82	0.44	
Uniform Delay, d1		27.5			30.1	27.6	37.3	10.9		35.5	6.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			4.0	0.1	7.0	3.6		35.0	0.2	
Delay (s)		27.5			34.1	27.7	44.4	14.5		70.5	6.3	
Level of Service		C			C	C	D	B		E	A	
Approach Delay (s)		27.5			31.2			14.9			15.9	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay		17.5			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		77.1			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		73.9%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Sign Control		Free			Free			Stop		Stop	Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	131	26	89	201	10	10	19	312	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	138	27	94	212	11	11	20	328	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1210										
pX, platoon unblocked												
vC, conflicting volume	222			165			593	582	152	915	591	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			165			593	582	152	915	591	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			97	95	63	93	97	99
cM capacity (veh/h)	1347			1413			381	393	895	146	389	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	316	359	32								
Volume Left	11	94	11	11								
Volume Right	27	11	328	11								
cSH	1347	1413	806	281								
Volume to Capacity	0.01	0.07	0.45	0.11								
Queue Length 95th (ft)	1	5	58	9								
Control Delay (s)	0.5	2.7	13.0	19.4								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.5	2.7	13.0	19.4								
Approach LOS		B	C									
Intersection Summary												
Average Delay		7.1										
Intersection Capacity Utilization		56.2%			ICU Level of Service			B				
Analysis Period (min)		15										

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	433	10	10	279	20	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	456	11	11	294	21	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	315			466			823	818	461	823	813	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			466			823	818	461	823	813	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	98	96	97	99
cM capacity (veh/h)	1245			1095			277	305	600	276	307	736
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	477	325	32	32								
Volume Left	11	11	11	11								
Volume Right	11	21	11	11								
cSH	1245	1095	351	364								
Volume to Capacity	0.01	0.01	0.09	0.09								
Queue Length 95th (ft)	1	1	7	7								
Control Delay (s)	0.3	0.4	16.3	15.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.4	16.3	15.8								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			37.5%		ICU Level of Service			A				
Analysis Period (min)			15									

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	432	10	10	279	10	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	455	11	11	294	11	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)					1160							
pX, platoon unblocked												
vC, conflicting volume	304			465			817	806	460	817	806	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			465			817	806	460	817	806	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	97	98	96	97	99
cM capacity (veh/h)	1257			1096			280	310	601	279	310	741
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	476	315	32	32								
Volume Left	11	11	11	11								
Volume Right	11	11	11	11								
cSH	1257	1096	354	367								
Volume to Capacity	0.01	0.01	0.09	0.09								
Queue Length 95th (ft)	1	1	7	7								
Control Delay (s)	0.3	0.4	16.2	15.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.4	16.2	15.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			37.4%		ICU Level of Service			A				
Analysis Period (min)			15									

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Flt		0.98			0.97			0.88			0.99	
Flt Protected		0.99			0.99			0.99			0.96	
Satd. Flow (prot)		1808			1785			1635			1771	
Flt Permitted		0.90			0.79			0.96			0.31	
Satd. Flow (perm)		1632			1426			1572			569	
Volume (vph)	60	315	77	116	238	99	35	6	266	112	21	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	332	81	122	251	104	37	6	280	118	22	15
RTOR Reduction (vph)	0	6	0	0	8	0	0	223	0	0	6	0
Lane Group Flow (vph)	0	470	0	0	469	0	0	100	0	0	149	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		55.3			55.3			15.7			15.7	
Effective Green, g (s)		55.8			55.8			16.2			16.2	
Actuated g/C Ratio		0.70			0.70			0.20			0.20	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1138			995			318			115	
v/s Ratio Prot												
v/s Ratio Perm		0.29			c0.33			0.06			c0.26	
v/c Ratio		0.41			0.47			0.31			1.30	
Uniform Delay, d1		5.1			5.5			27.2			31.9	
Progression Factor		1.00			1.06			1.00			1.00	
Incremental Delay, d2		1.1			0.9			0.6			184.3	
Delay (s)		6.2			6.7			27.7			216.1	
Level of Service		A			A			C			F	
Approach Delay (s)		6.2			6.7			27.7			216.1	
Approach LOS		A			A			C			F	
Intersection Summary												
HCM Average Control Delay		34.0			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		80.5%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Flt		0.97			0.98			0.91			0.96	
Flt Protected		1.00			0.98			0.99			0.97	
Satd. Flow (prot)		1802			1798			1682			1732	
Flt Permitted		0.92			0.64			0.89			0.45	
Satd. Flow (perm)		1671			1175			1510			806	
Volume (vph)	52	493	148	187	326	89	80	45	222	88	13	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	519	156	197	343	94	84	47	234	93	14	49
RTOR Reduction (vph)	0	11	0	0	7	0	0	84	0	0	22	0
Lane Group Flow (vph)	0	719	0	0	627	0	0	281	0	0	134	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		53.4			53.4			17.6			17.6	
Effective Green, g (s)		53.9			53.9			18.1			18.1	
Actuated g/C Ratio		0.67			0.67			0.23			0.23	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1126			792			342			182	
v/s Ratio Prot												
v/s Ratio Perm		0.43			c0.53			c0.19			0.17	
v/c Ratio		0.64			0.79			0.82			0.74	
Uniform Delay, d1		7.5			9.1			29.4			28.7	
Progression Factor		1.11			0.85			1.00			1.00	
Incremental Delay, d2		2.4			6.5			14.5			14.5	
Delay (s)		10.7			14.3			43.9			43.2	
Level of Service		B			B			D			D	
Approach Delay (s)		10.7			14.3			43.9			43.2	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM Average Control Delay		21.0			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		101.4%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00		
Frt	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		
Flt Protected	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1848	1583	1770	1863	1583	1770	3539	1583	3433	1741		
Flt Permitted	0.89	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1655	1583	1770	1863	1583	1770	3539	1583	3433	1741		
Volume (vph)	99	537	166	181	296	540	204	155	265	451	131	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	104	565	175	191	312	568	215	163	279	475	138	107
RTOR Reduction (vph)	0	0	110	0	0	273	0	0	237	0	35	0
Lane Group Flow (vph)	0	669	65	191	312	295	215	163	42	475	210	0
Turn Type	Perm	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	4		3	8		5	2		1	6		
Permitted Phases	4			8				2				
Actuated Green, G (s)	29.0	29.0	7.5	41.0	41.0	9.5	9.6	9.6	15.9	16.0		
Effective Green, g (s)	29.5	29.5	8.0	41.5	41.5	10.0	10.1	10.1	16.4	16.5		
Actuated g/C Ratio	0.37	0.37	0.10	0.52	0.52	0.12	0.13	0.13	0.20	0.21		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	610	584	177	966	821	221	447	200	704	359		
v/s Ratio Prot			c0.11	0.17		c0.12	0.05		c0.14	0.12		
v/s Ratio Perm	c0.40	0.04			0.19			0.03				
v/c Ratio	1.10	0.11	1.08	0.32	0.36	0.97	0.36	0.21	0.67	0.59		
Uniform Delay, d1	25.2	16.6	36.0	11.1	11.4	34.9	32.0	31.4	29.3	28.7		
Progression Factor	1.17	1.80	1.17	0.93	2.40	1.00	1.00	1.00	1.12	1.15		
Incremental Delay, d2	60.3	0.3	86.5	0.8	1.1	52.5	0.5	0.5	2.6	2.4		
Delay (s)	89.9	30.2	128.6	11.1	28.5	87.3	32.5	31.9	35.4	35.4		
Level of Service	F	C	F	B	C	F	C	C	D	D		
Approach Delay (s)	77.6			41.3			50.2			35.4		
Approach LOS	E			D			D			D		
Intersection Summary												
HCM Average Control Delay	51.1			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	87.1%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												
















8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3527	
Volume (vph)	5	30	140	5	95	95	164	155	5	30	202	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	147	5	100	100	173	163	5	32	213	5
RTOR Reduction (vph)	0	0	130	0	89	0	0	2	0	2	0	0
Lane Group Flow (vph)	5	32	17	5	111	0	173	163	3	32	216	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Perm	Prot	Perm	Prot	Prot	Perm	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.8	48.9	48.9	3.3	39.4	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		13.3	49.4	49.4	3.8	39.9	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.17	0.62	0.62	0.05	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		294	2185	978	84	1759	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.05		0.02	c0.06	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.59	0.07	0.00	0.38	0.12	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.8	6.1	5.9	37.0	10.7	
Progression Factor	1.00	1.00	1.00	0.84	1.36		1.09	0.98	0.98	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.3	0.4		2.5	0.1	0.0	2.9	0.1	
Delay (s)	39.7	32.4	32.1	33.6	44.8		36.0	6.1	5.7	39.8	10.9	
Level of Service	D	C	C	C	D		D	A	A	D	B	
Approach Delay (s)		32.3			44.5			21.3			14.6	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM Average Control Delay	26.5			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.24											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	30.5%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations		↕↕	↗	↖↖	↕↕					↘	↕↕				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0				
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91				
Flt		1.00	0.85	1.00	1.00					1.00	0.91				
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00				
Satd. Flow (prot)		3539	1583	3433	3539					1610	3084				
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00				
Satd. Flow (perm)		3539	1583	3433	3539					1610	3084				
Volume (vph)	0	872	381	89	523	0	0	0	0	328	324	489			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Adj. Flow (vph)	0	918	401	94	551	0	0	0	0	345	341	515			
RTOR Reduction (vph)	0	0	143	0	0	0	0	0	0	0	213	0			
Lane Group Flow (vph)	0	918	258	94	551	0	0	0	0	345	643	0			
Turn Type		Perm		Prot						Perm					
Protected Phases		4		3		8				6					
Permitted Phases		4						6							
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5				
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0				
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32				
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5				
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0				
Lane Grp Cap (vph)		1641	734	210	2035					523	1002				
v/s Ratio Prot		c0.26		c0.03		0.16									
v/s Ratio Perm				0.16						c0.21	0.21				
v/c Ratio		0.56	0.35	0.45	0.27					0.66	0.64				
Uniform Delay, d1		15.5	13.7	36.2	8.6					23.2	23.0				
Progression Factor		1.22	1.73	1.01	0.91					1.00	1.00				
Incremental Delay, d2		0.7	0.7	1.4	0.3					6.4	3.2				
Delay (s)		19.7	24.5	38.2	8.1					29.6	26.2				
Level of Service		B	C	D	A					C	C				
Approach Delay (s)		21.1		12.5		0.0		27.2							
Approach LOS		C		B		A		C							
Intersection Summary															
HCM Average Control Delay		21.7		HCM Level of Service		C									
HCM Volume to Capacity ratio		0.59													
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		12.0									
Intersection Capacity Utilization		60.2%		ICU Level of Service		B									
Analysis Period (min)		15													
c Critical Lane Group															
















10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3409		1681	1734	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3409		1681	1734	2787	1770	1814	
Volume (vph)	0	604	595	413	360	117	253	108	569	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	636	626	435	379	123	266	114	599	44	43	9
RTOR Reduction (vph)	0	0	274	0	32	0	0	0	475	0	7	0
Lane Group Flow (vph)	0	636	352	435	470	0	185	195	124	44	45	0
Turn Type	Prot	pm+ov			Prot	Split			Perm	Split		
Protected Phases	7	4	2	3	8	2			2	6		
Permitted Phases	4											
Actuated Green, G (s)	17.5	33.5	12.5	34.5	16.0			16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	34.5	13.0	35.0	16.5			16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.43	0.16	0.44	0.21			0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	683	558	1491	347			358	575	365	374	
v/s Ratio Prot	c0.13	0.11	c0.13	0.14	0.11			c0.11		c0.02	0.02	
v/s Ratio Perm	0.12			0.04								
v/c Ratio	0.56	0.52	0.78	0.32	0.53			0.54	0.21	0.12	0.12	
Uniform Delay, d1	27.5	16.6	32.1	14.7	28.3			28.4	26.4	25.8	25.8	
Progression Factor	1.48	4.60	1.18	1.22	0.87			0.87	1.55	0.84	0.82	
Incremental Delay, d2	1.6	2.3	6.3	0.5	5.3			5.4	0.8	0.7	0.7	
Delay (s)	42.2	78.8	44.1	18.4	30.0			30.1	41.7	22.4	21.9	
Level of Service	D	E	D	B	C			C	D	C	C	
Approach Delay (s)	60.4	30.3			37.2			22.1				
Approach LOS	E	C			D			C				
Intersection Summary												
HCM Average Control Delay	43.7			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	62.0%			ICU Level of Service					B			
Analysis Period (min)	15											
c Critical Lane Group												



































11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	 	 	 			 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3513		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3513		1770	1583
Volume (vph)	195	1016	653	33	92	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	1069	687	35	97	248
RTOR Reduction (vph)	0	0	4	0	0	183
Lane Group Flow (vph)	205	1069	718	0	97	65
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	10.0	50.5	36.0	20.5		
Effective Green, g (s)	10.5	51.0	36.5	21.0		
Actuated g/C Ratio	0.13	0.64	0.46	0.26		
Clearance Time (s)	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	451	2256	1603	465		
v/s Ratio Prot	0.06	c0.30	0.20	c0.05		
v/s Ratio Perm				0.04		
v/c Ratio	0.45	0.47	0.45	0.21		
Uniform Delay, d1	32.1	7.5	14.9	23.0		
Progression Factor	0.93	2.08	1.00	1.00		
Incremental Delay, d2	0.6	0.6	0.9	1.0		
Delay (s)	30.4	16.3	15.8	24.0		
Level of Service	C	B	B	C		
Approach Delay (s)	18.5		15.8	23.6		
Approach LOS	B		B	C		
Intersection Summary						
HCM Average Control Delay			18.4	HCM Level of Service		B
HCM Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			80.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			40.4%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						













12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900								
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0								
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00								
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85								
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00								
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583								
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00								
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583								
Volume (vph)	418	3	40	8	3	5	514	489	2	7	435	600								
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
Adj. Flow (vph)	440	3	42	8	3	5	541	515	2	7	458	632								
RTOR Reduction (vph)	0	0	34	0	5	0	0	0	0	0	0	486								
Lane Group Flow (vph)	220	223	8	0	11	0	541	517	0	7	458	146								
Turn Type	Split	Perm		Split	Prot			Prot		Perm										
Protected Phases	4	4		8	8		5	2		1	6									
Permitted Phases			4									6								
Actuated Green, G (s)	15.4	15.4	15.4		1.5		27.1	43.6		1.5	18.0	18.0								
Effective Green, g (s)	15.9	15.9	15.9		2.0		27.6	44.1		2.0	18.5	18.5								
Actuated g/C Ratio	0.20	0.20	0.20		0.02		0.35	0.55		0.02	0.23	0.23								
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0								
Lane Grp Cap (vph)	334	335	315		44		611	1950		44	818	366								
v/s Ratio Prot	0.13	c0.13			c0.01		c0.31	0.15		0.00	c0.13									
v/s Ratio Perm			0.01									0.09								
v/c Ratio	0.66	0.67	0.03		0.25		0.89	0.26		0.16	0.56	0.40								
Uniform Delay, d1	29.5	29.6	25.8		38.3		24.7	9.4		38.2	27.2	26.0								
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.40	0.97	4.55								
Incremental Delay, d2	4.6	4.9	0.0		3.0		14.4	0.3		1.2	2.0	2.3								
Delay (s)	34.2	34.5	25.9		41.3		39.1	9.8		54.7	28.4	120.9								
Level of Service	C	C	C		D		D	A		D	C	F								
Approach Delay (s)		33.6			41.3			24.8			81.9									
Approach LOS		C			D			C			F									
Intersection Summary																				
HCM Average Control Delay			50.1	HCM Level of Service					D											
HCM Volume to Capacity ratio			0.72																	
Actuated Cycle Length (s)			80.0	Sum of lost time (s)					16.0											
Intersection Capacity Utilization			79.0%	ICU Level of Service					D											
Analysis Period (min)			15																	
c Critical Lane Group																				














13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583	1863	1583		1863
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1770	1583	1863	1583		1863
Volume (vph)	116	37	832	63	0	634
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	122	39	876	66	0	667
RTOR Reduction (vph)	0	33	0	18	0	0
Lane Group Flow (vph)	122	6	876	48	0	667
Turn Type	Perm		Perm			
Protected Phases	8		2		6	
Permitted Phases	8		2			
Actuated Green, G (s)	9.7	9.7	49.2	49.2	49.2	
Effective Green, g (s)	10.2	10.2	49.7	49.7	49.7	
Actuated g/C Ratio	0.15	0.15	0.73	0.73	0.73	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	266	238	1364	1159	1364	
v/s Ratio Prot	c0.07		c0.47		0.36	
v/s Ratio Perm	0.00		0.03			
v/c Ratio	0.46	0.02	0.64	0.04	0.49	
Uniform Delay, d1	26.3	24.6	4.6	2.5	3.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.0	1.0	0.0	0.3	
Delay (s)	27.6	24.6	5.6	2.5	4.1	
Level of Service	C	C	A	A	A	
Approach Delay (s)	26.9		5.4		4.1	
Approach LOS	C		A		A	
Intersection Summary						
HCM Average Control Delay			6.9	HCM Level of Service		A
HCM Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			67.9	Sum of lost time (s)		8.0
Intersection Capacity Utilization			56.9%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	172	89	33	464	489	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	181	94	35	488	515	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	279	558			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	279	558			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	87	97			
cM capacity (veh/h)	289	718	1009			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	181	94	35	244	244	343 215
Volume Left	181	0	35	0	0	0 0
Volume Right	0	94	0	0	0	0 43
cSH	289	718	1009	1700	1700	1700 1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20 0.13
Queue Length 95th (ft)	97	11	3	0	0	0 0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0 0.0
Lane LOS	E	B	A			
Approach Delay (s)	27.5		0.6			0.0
Approach LOS	D					
Intersection Summary						
Average Delay	5.8					
Intersection Capacity Utilization	37.7%		ICU Level of Service		A	
Analysis Period (min)	15					

























16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	333	562	251	282	467
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	351	592	264	297	492
RTOR Reduction (vph)	0	274	0	150	0	0
Lane Group Flow (vph)	271	77	592	114	297	492
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.4	13.4	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.9	13.9	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	391	349	801	681	281	1215
v/s Ratio Prot	c0.15		c0.32		c0.17	
v/s Ratio Perm	0.05		0.07			
v/c Ratio	0.69	0.22	0.74	0.17	1.06	0.40
Uniform Delay, d1	22.6	20.1	15.0	11.0	26.5	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.3	6.1	0.5	69.5	1.0
Delay (s)	27.8	20.4	21.0	11.5	96.0	6.2
Level of Service	C	C	C	B	F	A
Approach Delay (s)	23.7		18.1		40.0	
Approach LOS	C		B		D	
Intersection Summary						
HCM Average Control Delay			27.2	HCM Level of Service		C
HCM Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			63.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			69.4%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	670	36	202	622	154	64	19	154	270	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	705	38	213	655	162	67	20	162	284	45	104
RTOR Reduction (vph)	0	0	29	0	0	119	0	63	70	0	59	0
Lane Group Flow (vph)	53	705	9	213	655	43	67	34	15	284	90	0
Turn Type	Prot		Perm		Prot		Perm		Prot		Perm	
Protected Phases	7		4		3		8		5		2	
Permitted Phases			4				8				2	
Actuated Green, G (s)	3.3	18.3	18.3	5.5	20.5	20.5	4.4	13.8	13.8	24.4	33.8	
Effective Green, g (s)	3.8	18.8	18.8	6.0	21.0	21.0	4.9	14.3	14.3	24.9	34.3	
Actuated g/C Ratio	0.05	0.24	0.24	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	832	372	257	929	416	210	279	269	551	715	
v/s Ratio Prot	0.03	c0.20		0.06	c0.19		c0.02	c0.02		c0.16	0.05	
v/s Ratio Perm			0.01			0.03			0.01			
v/c Ratio	0.63	0.85	0.02	0.83	0.71	0.10	0.32	0.12	0.06	0.52	0.13	
Uniform Delay, d1	37.4	29.2	23.5	36.5	26.7	22.4	36.0	27.6	27.3	22.6	13.8	
Progression Factor	1.00	1.00	1.00	0.84	0.55	0.24	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	8.0	0.0	15.8	1.9	0.1	0.9	0.9	0.4	0.8	0.4	
Delay (s)	51.8	37.2	23.6	46.5	16.5	5.3	36.8	28.5	27.7	23.4	14.2	
Level of Service	D	D	C	D	B	A	D	C	C	C	B	
Approach Delay (s)	37.6				20.9		30.4				20.2	
Approach LOS	D				C		C				C	
Intersection Summary												
HCM Average Control Delay			27.0		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			56.7%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	771	146	371	703	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	812	154	391	740	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	255	0	117	227	0	0	206
Lane Group Flow (vph)	245	812	51	391	740	122	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	26.0	26.0	11.5	25.4	25.4	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.6	26.5	26.5	12.0	25.9	25.9	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1684	524	515	1146	512	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.16		0.11	c0.21		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.88	0.48	0.10	0.76	0.65	0.24	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	21.3	18.5	32.6	23.1	19.8	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.81	0.50	0.37	0.78	0.69	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.1	0.7	0.3	5.3	2.3	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	45.8	11.4	7.0	30.7	18.2	20.1	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	A	C	B	C	D	C	C	D	D	C
Approach Delay (s)		17.8			21.9			32.5			35.9	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.7			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		67.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												












19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00				1.00	0.95	0.95
Frt		0.97		1.00	1.00	0.85				0.90	1.00	1.00
Flt Protected		1.00		0.95	1.00	1.00				0.99	0.95	0.95
Satd. Flow (prot)		4938		1770	3539	1583				1658	1681	1686
Flt Permitted		1.00		0.95	1.00	1.00				0.91	0.74	0.71
Satd. Flow (perm)		4938		1770	3539	1583				1529	1311	1254
Volume (vph)	0	1254	301	68	1071	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1320	317	72	1127	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	47	0	0	0	0	0	12	0	0	0	44
Lane Group Flow (vph)	0	1590	0	72	1127	209	0	13	0	370	370	325
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases						Free	2			6		6
Actuated Green, G (s)		35.4		4.8	44.7	80.0		26.3		26.3	26.3	26.3
Effective Green, g (s)		35.9		5.3	45.2	80.0		26.8		26.8	26.8	26.8
Actuated g/C Ratio		0.45		0.07	0.57	1.00		0.34		0.34	0.34	0.34
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2216		117	2000	1583		512		439	420	530
v/s Ratio Prot		c0.32		0.04	c0.32							
v/s Ratio Perm						0.13		0.01		0.28	c0.30	0.21
v/c Ratio		0.72		0.62	0.56	0.13		0.03		0.84	0.88	0.61
Uniform Delay, d1		17.9		36.4	11.1	0.0		17.8		24.6	25.1	22.3
Progression Factor		0.41		1.02	1.19	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		1.7		8.6	1.1	0.2		0.0		13.7	18.9	2.1
Delay (s)		9.1		45.6	14.3	0.2		17.9		38.4	44.0	24.4
Level of Service		A		D	B	A		B		D	D	C
Approach Delay (s)		9.1			13.8			17.9			35.6	
Approach LOS		A			B			B			D	
Intersection Summary												
HCM Average Control Delay		17.8			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		70.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00		
Flt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98		
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96		
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748		
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.78		
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1418		
Volume (vph)	17	1677	273	0	1001	350	334	0	306	14	0	3	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	18	1765	287	0	1054	368	352	0	322	15	0	3	
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0	
Lane Group Flow (vph)	18	1765	287	0	1054	368	352	160	160	0	16	0	
Turn Type	Prot	Free		Free			Perm	Perm		Perm			
Protected Phases	7	4	8			2		2		6			
Permitted Phases			Free	Free			2	2		6			
Actuated Green, G (s)	2.2	56.2	80.0	49.5			80.0	14.8	14.8	14.8			
Effective Green, g (s)	2.7	56.7	80.0	50.0			80.0	15.3	15.3	15.3			
Actuated g/C Ratio	0.03	0.71	1.00	0.62			1.00	0.19	0.19	0.19			
Clearance Time (s)	4.5	4.5	4.5			4.5		4.5	4.5	4.5			
Vehicle Extension (s)	3.0	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	60	4542	1583	3178			1583	515	288	288	271		
v/s Ratio Prot	0.01	c0.28	0.21			0.11							
v/s Ratio Perm			0.18	0.23			c0.13	0.11		0.01			
v/c Ratio	0.30	0.39	0.18	0.33			0.23	0.68	0.56	0.56	0.06		
Uniform Delay, d1	37.7	4.7	0.0	7.1			0.0	30.1	29.3	29.3	26.5		
Progression Factor	1.07	0.99	1.00	0.56			1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.8	0.2	0.2	0.2			0.3	3.7	2.3	2.3	0.1		
Delay (s)	42.2	4.8	0.2	4.2			0.3	33.8	31.6	31.6	26.5		
Level of Service	D	A	A	A			A	C	C	C	C		
Approach Delay (s)	4.5		3.2			32.8		26.5					
Approach LOS	A		A			C		C					
Intersection Summary													
HCM Average Control Delay			8.7	HCM Level of Service					A				
HCM Volume to Capacity ratio			0.45										
Actuated Cycle Length (s)			80.0	Sum of lost time (s)					8.0				
Intersection Capacity Utilization			50.3%	ICU Level of Service					A				
Analysis Period (min)			15										
c Critical Lane Group													

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	4950		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	4950		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1184	545	141	787	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1246	574	148	828	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	395	0	38	0	0	0	189	0	0	164
Lane Group Flow (vph)	284	1246	179	148	969	0	226	475	47	107	242	29
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.5	24.5	24.5	10.6	22.6		15.4	15.4	15.4	11.5	11.5	11.5
Effective Green, g (s)	13.0	25.0	25.0	11.1	23.1		15.9	15.9	15.9	12.0	12.0	12.0
Actuated g/C Ratio	0.16	0.31	0.31	0.14	0.29		0.20	0.20	0.20	0.15	0.15	0.15
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	558	1589	495	246	1429		320	662	315	242	509	237
v/s Ratio Prot	0.08	c0.25		0.08	c0.20		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.11						0.03			0.02
v/c Ratio	0.51	0.78	0.36	0.60	0.68		0.71	0.72	0.15	0.44	0.48	0.12
Uniform Delay, d1	30.6	25.0	21.3	32.4	25.2		29.9	30.0	26.5	31.0	31.1	29.4
Progression Factor	0.90	0.90	2.97	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	3.7	1.9	4.1	2.6		6.9	3.7	0.2	1.3	0.7	0.2
Delay (s)	28.3	26.2	65.1	36.5	27.8		36.8	33.7	26.7	32.2	31.8	29.7
Level of Service	C	C	E	D	C		D	C	C	C	C	C
Approach Delay (s)		37.1			28.9			32.7			31.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			33.5			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			63.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	119	321	494	108	142	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	125	338	520	114	149	360	231
RTOR Reduction (vph)	0	67	0	0	96	0	0	75	0	0	174	
Lane Group Flow (vph)	140	655	0	135	620	29	338	520	39	149	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.08	0.19	
v/s Ratio Perm					0.02			0.02			0.04	
v/c Ratio	0.92	0.82		0.88	0.75	0.08	0.94	0.81	0.07	0.83	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	20.7	27.3	20.5	15.2	30.6	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.1	33.1	10.4	0.3	26.8	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	20.7	60.4	30.9	15.4	57.4	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	E	D	C
Approach Delay (s)		39.7			33.8			39.4			36.4	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM Average Control Delay		37.4			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		69.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												



















23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3515		1770	3539	1583	1770	1660	1583	1770	1649	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3515		1770	3539	1583	1770	1660	1583	1770	1649	1583
Volume (vph)	102	671	32	53	754	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	706	34	56	794	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	135	0	61	0	0	60	0	0
Lane Group Flow (vph)	107	737	0	56	794	216	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8			2			6	
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1125		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.21		0.03	c0.22		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm					0.14							
v/c Ratio	0.67	0.65		0.58	0.79	0.48	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.3		41.6	29.7	26.7	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.68	0.59	0.22	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	3.0		8.0	5.7	3.3	22.4	1.0		5.7	0.1	
Delay (s)	50.4	29.3		36.2	23.4	9.2	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		32.0			19.8			49.1			27.8	
Approach LOS		C			B			D			C	
Intersection Summary												
HCM Average Control Delay		26.7			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		71.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	407	99	916	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	428	104	964	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	0	0	85	0
Lane Group Flow (vph)	0	862	321	104	964	0	0	0	0	673	138	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06		c0.27				c0.20	0.09	
v/s Ratio Perm		0.20										
v/c Ratio		0.59	0.49	0.44	0.46					0.61	0.27	
Uniform Delay, d1		20.7	19.6	35.8	10.5					25.7	22.6	
Progression Factor		0.54	0.48	1.25	1.65					1.00	1.00	
Incremental Delay, d2		1.3	2.0	1.2	0.7					1.0	1.3	
Delay (s)		12.5	11.5	46.0	18.0					26.7	23.9	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		12.1		20.7		0.0				26.0		
Approach LOS		B		C		A				C		
Intersection Summary												
HCM Average Control Delay		18.8		HCM Level of Service		B						
HCM Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)		8.0						
Intersection Capacity Utilization		61.7%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	↗	↖	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↕↕			↕↕	↖↖	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0			4.0	4.0	4.0	
Lane Util. Factor	0.95			0.95	0.97	1.00	
Frt	1.00			1.00	1.00	0.85	
Flt Protected	1.00			1.00	0.95	1.00	
Satd. Flow (prot)	3539			3539	3433	1583	
Flt Permitted	1.00			1.00	0.95	1.00	
Satd. Flow (perm)	3539			3539	3433	1583	
Volume (vph)	1461	0	0	617	367	236	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	1538	0	0	649	386	248	
RTOR Reduction (vph)	0	0	0	0	0	21	
Lane Group Flow (vph)	1538	0	0	649	386	227	
Turn Type					Perm		
Protected Phases	4			8	2		
Permitted Phases					2		
Actuated Green, G (s)	63.1			63.1	17.9	17.9	
Effective Green, g (s)	63.6			63.6	18.4	18.4	
Actuated g/C Ratio	0.71			0.71	0.20	0.20	
Clearance Time (s)	4.5			4.5	4.5	4.5	
Vehicle Extension (s)	3.0			3.0	3.0	3.0	
Lane Grp Cap (vph)	2501			2501	702	324	
v/s Ratio Prot	c0.43			0.18	0.11		
v/s Ratio Perm					c0.14		
v/c Ratio	0.61			0.26	0.55	0.70	
Uniform Delay, d1	6.8			4.7	32.1	33.3	
Progression Factor	0.32			1.00	1.00	1.00	
Incremental Delay, d2	0.9			0.3	0.9	6.7	
Delay (s)	3.1			5.0	33.0	40.0	
Level of Service	A			A	C	D	
Approach Delay (s)	3.1			5.0	35.7		
Approach LOS	A			A	D		
Intersection Summary							
HCM Average Control Delay			10.9	HCM Level of Service		B	
HCM Volume to Capacity ratio			0.63				
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization			61.7%	ICU Level of Service		B	
Analysis Period (min)			15				
c Critical Lane Group							

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00			1.00	1.00		0.95	1.00		1.00	0.95
Flt		0.94			1.00	0.85		1.00	0.85		1.00	1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)		1718			1842	1583		1770	3539		1770	3536
Flt Permitted		0.92			0.94	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)		1601			1747	1583		1770	3539		1770	3536
Volume (vph)	7	6	11	2	7	203	19	752	20	116	562	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	6	12	2	7	214	20	792	21	122	592	4
RTOR Reduction (vph)	0	10	0	0	0	185	0	0	10	0	0	0
Lane Group Flow (vph)	0	15	0	0	9	29	20	792	11	122	596	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		6.3			6.3	6.3	0.9	24.9	24.9	4.8	28.8	
Effective Green, g (s)		6.8			6.8	6.8	1.4	25.4	25.4	5.3	29.3	
Actuated g/C Ratio		0.14			0.14	0.14	0.03	0.51	0.51	0.11	0.59	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		220			240	217	50	1816	812	190	2093	
v/s Ratio Prot							0.01	c0.22		c0.07	c0.17	
v/s Ratio Perm		0.01			0.01	c0.02			0.01			
v/c Ratio		0.07			0.04	0.14	0.40	0.44	0.01	0.64	0.28	
Uniform Delay, d1		18.6			18.5	18.8	23.6	7.6	5.9	21.2	5.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.1	0.3	5.2	0.2	0.0	7.2	0.1	
Delay (s)		18.7			18.6	19.1	28.8	7.7	5.9	28.4	5.0	
Level of Service		B			B	B	C	A	A	C	A	
Approach Delay (s)		18.7			19.0			8.2			9.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay		10.0										
HCM Volume to Capacity ratio		0.43										
Actuated Cycle Length (s)		49.5										
Intersection Capacity Utilization		46.7%										
Analysis Period (min)		15										
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	139	3	4	199	2	9	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	146	3	4	209	2	9	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	212			149			369	370	148	370	371	211
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			149			369	370	148	370	371	211
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1359			1432			585	557	899	584	557	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	216	11	1								
Volume Left	1	4	9	0								
Volume Right	3	2	1	0								
cSH	1359	1432	606	557								
Volume to Capacity	0.00	0.00	0.02	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.1	0.2	11.0	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.0	11.5								
Approach LOS		B	B									
Intersection Summary												
Average Delay		0.5										
Intersection Capacity Utilization		27.2%										
Analysis Period (min)		15										
ICU Level of Service A												

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	123	2	4	208	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	129	2	4	219	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			132			365	368	131	369	365	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227			132			365	368	131	369	365	223
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1341			1454			588	559	919	578	561	816
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	232	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1341	1454	561	614								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		24.0%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	9	4	270	5	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	9	4	284	5	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			166		454	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		454	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		562	883
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	166	288	17			
Volume Left	0	4	5			
Volume Right	9	0	12			
cSH	1700	1412	749			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		27.4%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	9	11	250	0	25	0	8	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	9	12	263	0	26	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			173			454	454	168	463	459	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			173			454	454	168	463	459	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	100	99	100	100	100
cM capacity (veh/h)	1301			1404			513	498	876	501	495	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	275	35	0								
Volume Left	0	12	26	0								
Volume Right	9	0	8	0								
cSH	1301	1404	570	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization		32.1%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	135	22	0	235	37	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	23	0	247	39	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			165		401	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		401	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1413		605	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	247	39			
Volume Left	0	0	39			
Volume Right	23	0	0			
cSH	1700	1413	605			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	126	102	13	902	96	544
v/c Ratio	0.08	0.56	0.29	0.10	0.80	0.67	0.42
Control Delay	16.6	36.9	8.6	37.8	19.7	57.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	36.9	8.6	37.8	19.7	57.9	7.3
Queue Length 50th (ft)	3	52	0	5	296	42	76
Queue Length 95th (ft)	22	107	38	23	#623	#124	237
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	384	299	426	132	1169	144	1308
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.42	0.24	0.10	0.77	0.67	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	476	477	323	155
v/c Ratio	0.42	0.48	0.60	0.75
Control Delay	7.5	8.1	9.8	48.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.5	8.1	9.8	48.9
Queue Length 50th (ft)	78	80	18	71
Queue Length 95th (ft)	194	m184	75	119
Internal Link Dist (ft)	1080	1070	911	2200
Turn Bay Length (ft)				
Base Capacity (vph)	1140	1003	732	351
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.44	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	730	634	365	156
v/c Ratio	0.64	0.81	0.85	0.68
Control Delay	11.8	18.2	39.7	37.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.8	18.2	39.7	37.6
Queue Length 50th (ft)	257	219	119	56
Queue Length 95th (ft)	326 m#320	#250	#122	
Internal Link Dist (ft)	1070	550	687	2220
Turn Bay Length (ft)				
Base Capacity (vph)	1135	780	479	263
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.81	0.76	0.59

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	669	175	191	312	568	215	163	279	475	245
v/c Ratio	1.10	0.25	1.08	0.32	0.52	0.97	0.36	0.64	0.68	0.62
Control Delay	90.8	6.3	128.9	11.4	4.3	92.3	33.4	11.8	40.5	35.0
Queue Delay	122.7	0.0	0.0	1.2	0.5	0.0	0.0	0.1	0.0	0.0
Total Delay	213.5	6.3	128.9	12.6	4.8	92.3	33.4	12.0	40.5	35.0
Queue Length 50th (ft)	~381	13	~110	52	17	109	40	4	120	100
Queue Length 95th (ft)	m#572	m33	m#219	m107	84	#241	63	65	#229	177
Internal Link Dist (ft)	550			220			110			270
Turn Bay Length (ft)						150		100	275	
Base Capacity (vph)	610	694	177	966	1095	221	730	542	702	394
Starvation Cap Reductn	0	0	0	441	205	0	0	0	0	0
Spillback Cap Reductn	125	0	0	0	0	0	0	20	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.25	1.08	0.59	0.64	0.97	0.22	0.53	0.68	0.62

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	147	5	200	173	163	5	32	218
v/c Ratio	0.04	0.15	0.48	0.04	0.44	0.59	0.07	0.00	0.20	0.11
Control Delay	34.4	32.8	11.5	29.0	25.5	39.6	6.6	6.4	35.8	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.5	29.0	25.5	39.6	6.6	6.4	35.8	11.4
Queue Length 50th (ft)	2	15	0	2	20	82	5	0	15	23
Queue Length 95th (ft)	13	39	49	m6	72	m122	m38	m2	40	64
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	488	155	854	400	2462	1102	184	1918
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.07	0.00	0.17	0.11
Intersection Summary										
m Volume for 95th percentile queue is metered by upstream signal.										

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	918	401	94	551	345	856
v/c Ratio	0.55	0.45	0.37	0.27	0.66	0.70
Control Delay	19.9	9.8	39.8	8.2	30.4	18.2
Queue Delay	4.0	1.4	0.0	0.0	0.0	0.0
Total Delay	24.0	11.2	39.8	8.2	30.4	18.2
Queue Length 50th (ft)	205	43	21	38	161	127
Queue Length 95th (ft)	m242	m104	m44	67	261	197
Internal Link Dist (ft)	220			466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	892	257	2035	523	1215
Starvation Cap Reductn	663	303	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.68	0.37	0.27	0.66	0.70
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	636	626	435	502	185	195	599	44	52
v/c Ratio	0.56	0.65	0.78	0.33	0.53	0.54	0.57	0.12	0.14
Control Delay	42.5	12.9	48.2	16.5	30.6	30.7	6.3	22.7	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	12.9	48.2	16.5	30.6	30.7	6.3	22.7	19.5
Queue Length 50th (ft)	124	170	120	111	60	63	0	22	23
Queue Length 95th (ft)	153	260	#180	148	m124	m129	78	51	54
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	957	558	1523	347	358	1050	365	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.65	0.78	0.33	0.53	0.54	0.57	0.12	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↘	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	205	1069	722	97	248
v/c Ratio	0.46	0.47	0.45	0.21	0.41
Control Delay	32.3	16.6	16.2	24.5	5.8
Queue Delay	0.0	0.6	0.0	0.0	0.0
Total Delay	32.3	17.2	16.2	24.5	5.8
Queue Length 50th (ft)	56	211	123	38	0
Queue Length 95th (ft)	88	245	180	76	53
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1609	465	598
Starvation Cap Reductn	0	740	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.71	0.45	0.21	0.41

Intersection Summary

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	→	↘	←	↙	↑	↗	↓	↘
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	220	223	42	16	541	517	7	458	632
v/c Ratio	0.66	0.67	0.12	0.11	1.02	0.23	0.05	0.40	0.67
Control Delay	38.7	39.0	8.8	29.3	74.3	9.2	47.1	25.1	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	38.7	39.0	8.8	29.3	74.3	9.2	47.1	25.1	13.9
Queue Length 50th (ft)	107	109	0	5	~278	39	4	103	124
Queue Length 95th (ft)	168	170	23	23	#478	147	m6	m#209	m#235
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	447	179	531	2270	177	1140	938
Starvation Cap Reductn	0	0	0	0	0	0	0	0	48
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.50	0.09	0.09	1.02	0.23	0.04	0.40	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	↗	↑	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	122	39	876	66	667
v/c Ratio	0.43	0.14	0.64	0.06	0.49
Control Delay	22.0	8.1	8.5	1.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	8.1	8.5	1.4	6.0
Queue Length 50th (ft)	32	0	129	0	81
Queue Length 95th (ft)	72	19	307	10	185
Internal Link Dist (ft)	306		2550		954
Turn Bay Length (ft)					
Base Capacity (vph)	432	415	1373	1184	1373
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.09	0.64	0.06	0.49

Intersection Summary

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	351	592	264	297	492
v/c Ratio	0.69	0.56	0.74	0.32	1.06	0.40
Control Delay	32.6	6.7	22.9	3.1	100.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	6.7	22.9	3.1	100.8	6.8
Queue Length 50th (ft)	96	0	193	0	~136	84
Queue Length 95th (ft)	168	57	#351	38	#272	136
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	654	800	830	281	1215
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.54	0.74	0.32	1.06	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	705	38	213	655	162	67	97	85	284	149
v/c Ratio	0.40	0.94	0.10	0.83	0.71	0.30	0.26	0.25	0.22	0.53	0.18
Control Delay	44.6	53.3	9.9	54.2	20.4	2.3	37.7	11.2	8.1	27.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	53.3	9.9	54.2	20.4	2.3	37.7	11.2	8.1	27.8	5.7
Queue Length 50th (ft)	26	183	0	38	131	0	16	8	0	118	13
Queue Length 95th (ft)	61	#290	23	m#104	#244	m4	36	48	36	193	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	929	535	257	392	387	531	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.94	0.10	0.83	0.71	0.30	0.26	0.25	0.22	0.53	0.18

Intersection Summary


95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	812	154	391	740	377	144	435	274	383	278	256
v/c Ratio	0.88	0.48	0.25	0.76	0.65	0.49	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	52.0	11.6	2.0	34.8	18.7	4.4	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	11.6	2.0	34.8	18.7	4.4	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	76	57	3	107	182	35	71	74	0	95	129	0
Queue Length 95th (ft) m#133	m63	m6	#167	213	47	#157	118	65	#188	#230	58	
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1145	767	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.48	0.25	0.76	0.65	0.49	0.65	0.55	0.52	0.75	0.70	0.48

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak



Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1637	72	1127	209	25	370	370	369
v/c Ratio	0.71	0.51	0.56	0.13	0.05	0.84	0.88	0.64
Control Delay	8.9	48.9	15.2	0.2	9.8	43.2	48.5	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	48.9	15.2	0.2	9.8	43.2	48.5	23.6
Queue Length 50th (ft)	134	39	175	0	2	169	172	120
Queue Length 95th (ft)	171	m#78	247	m0	18	#318	#329	209
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2319	142	2000	1583	568	475	455	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.51	0.56	0.13	0.04	0.78	0.81	0.60

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↗	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1765	287	1054	368	352	161	161	18
v/c Ratio	0.14	0.39	0.18	0.31	0.23	0.68	0.56	0.56	0.06
Control Delay	38.9	5.3	0.2	4.3	0.3	36.5	35.8	35.8	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	5.3	0.2	4.3	0.3	36.5	35.8	35.8	21.6
Queue Length 50th (ft)	10	120	0	50	0	85	76	76	6
Queue Length 95th (ft)	m13	m180	m0	109	m0	117	127	127	21
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	4540	1583	3348	1583	1415	790	790	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.39	0.18	0.31	0.23	0.25	0.20	0.20	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↗	→	↘	↖	←	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1246	574	148	1007	226	475	236	107	242	193
v/c Ratio	0.51	0.78	0.64	0.60	0.69	0.71	0.72	0.47	0.44	0.48	0.48
Control Delay	30.9	27.3	10.7	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	27.3	11.0	46.8	28.3	42.9	36.7	7.4	35.9	33.6	8.9
Queue Length 50th (ft)	70	227	112	69	155	114	120	0	54	62	0
Queue Length 95th (ft)	107	#276	213	#187	#253	#210	173	56	98	91	51
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	558	1592	890	246	1470	342	707	522	342	720	488
Starvation Cap Reductn	0	0	51	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.78	0.68	0.60	0.69	0.66	0.67	0.45	0.31	0.34	0.40
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	125	338	520	114	149	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.27	0.95	0.81	0.18	0.83	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.4	66.8	32.8	4.5	69.5	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.4	66.8	32.8	4.5	69.5	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	64	146	0
Queue Length 95th (ft)	#162	#221	#155	184	37	#296	#358	30	#161	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	479	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.26	0.95	0.81	0.18	0.83	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	107	740	56	794	351	51	91	511	132		
v/c Ratio	0.67	0.60	0.47	0.74	0.57	0.43	0.44	0.80	0.18		
Control Delay	64.2	29.8	39.9	23.0	6.5	52.2	21.8	35.9	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.2	29.8	39.9	23.0	6.5	52.2	21.8	35.9	5.8		
Queue Length 50th (ft)	61	203	33	237	4	28	14	237	10		
Queue Length 95th (ft)	#161	#285	#69	#336	18	65	57	#388	43		
Internal Link Dist (ft)		6630		350			200		236		
Turn Bay Length (ft)	225		150		80	50		225			
Base Capacity (vph)	159	1232	118	1077	613	118	367	653	782		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.67	0.60	0.47	0.74	0.57	0.43	0.25	0.78	0.17		

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	428	104	964	673	223
v/c Ratio	0.58	0.56	0.39	0.46	0.61	0.37
Control Delay	12.9	8.1	46.8	18.2	28.6	12.4
Queue Delay	0.2	0.3	0.0	0.3	0.0	0.0
Total Delay	13.1	8.4	46.8	18.5	28.6	12.4
Queue Length 50th (ft)	124	65	57	223	164	40
Queue Length 95th (ft)	154	m101	m108	280	222	98
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	770	295	2084	1106	595
Starvation Cap Reductn	139	66	0	492	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.61	0.35	0.61	0.61	0.37
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	386	248
v/c Ratio	0.61	0.26	0.55	0.72
Control Delay	3.5	5.8	34.2	41.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.5	5.8	34.2	41.1
Queue Length 50th (ft)	0	58	102	119
Queue Length 95th (ft)	243	112	129	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2502	2502	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.32	0.43
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative E (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	9	214	20	792	21	122	596
v/c Ratio	0.09	0.03	0.48	0.10	0.42	0.02	0.42	0.26
Control Delay	13.7	17.1	7.5	23.7	10.2	5.2	22.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	17.1	7.5	23.7	10.2	5.2	22.1	5.3
Queue Length 50th (ft)	3	2	0	4	78	0	26	21
Queue Length 95th (ft)	19	12	44	22	146	10	77	93
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	528	564	642	205	2048	925	323	2426
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.33	0.10	0.39	0.02	0.38	0.25
Intersection Summary								

**CUMULATIVE 2020 + ALTERNATIVE E
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0		4.0		4.0
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00		1.00
Flt		0.93			1.00	0.85		1.00		0.99		1.00
Flt Protected		1.00			0.96	1.00		0.95		1.00		0.95
Satd. Flow (prot)		1725			1785	1583		1770		1836		1770
Flt Permitted		1.00			0.73	1.00		0.95		1.00		0.95
Satd. Flow (perm)		1725			1364	1583		1770		1836		1770
Volume (vph)	0	13	16	143	22	134	14	714	74	118	508	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	14	17	151	23	141	15	752	78	124	535	3
RTOR Reduction (vph)	0	14	0	0	0	94	0	4	0	0	0	0
Lane Group Flow (vph)	0	17	0	0	174	47	15	826	0	124	538	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		11.0			11.0	11.0	1.0	43.8		5.6	48.4	
Effective Green, g (s)		11.5			11.5	11.5	1.5	44.3		6.1	48.9	
Actuated g/C Ratio		0.16			0.16	0.16	0.02	0.60		0.08	0.66	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		268			212	246	36	1101		146	1231	
v/s Ratio Prot		0.01					0.01	c0.45		c0.07	0.29	
v/s Ratio Perm					c0.13	0.03						
v/c Ratio		0.06			0.82	0.19	0.42	0.75		0.85	0.44	
Uniform Delay, d1		26.6			30.2	27.2	35.8	10.8		33.4	5.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			21.8	0.4	7.6	2.8		34.3	0.2	
Delay (s)		26.7			52.0	27.5	43.4	13.6		67.8	6.2	
Level of Service		C			D	C	D	B		E	A	
Approach Delay (s)		26.7			41.0			14.1			17.7	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM Average Control Delay		20.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		73.9			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Flt		0.98			1.00			0.88			0.95	
Flt Protected		1.00			0.99			1.00			0.98	
Satd. Flow (prot)		1827			1836			1630			1750	
Flt Permitted		0.97			0.87			0.99			0.85	
Satd. Flow (perm)		1775			1609			1621			1518	
Volume (vph)	10	170	26	88	280	9	10	19	312	10	10	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	179	27	93	295	9	11	20	328	11	11	11
RTOR Reduction (vph)	0	11	0	0	2	0	0	209	0	0	7	0
Lane Group Flow (vph)	0	206	0	0	395	0	0	150	0	0	26	0
Turn Type	Perm			Perm		Perm		Perm		Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8				2		6		
Actuated Green, G (s)		10.0			10.0			10.1			10.1	
Effective Green, g (s)		10.5			10.5			10.6			10.6	
Actuated g/C Ratio		0.36			0.36			0.36			0.36	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		640			581			590			553	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.25			c0.09			0.02	
v/c Ratio		0.32			0.68			0.26			0.05	
Uniform Delay, d1		6.7			7.9			6.5			6.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			3.3			0.2			0.0	
Delay (s)		7.0			11.1			6.7			6.0	
Level of Service		A			B			A			A	
Approach Delay (s)		7.0			11.1			6.7			6.0	
Approach LOS		A			B			A			A	
Intersection Summary												
HCM Average Control Delay		8.5			HCM Level of Service			A				
HCM Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		29.1			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		62.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	472	10	9	359	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	497	11	9	378	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	387			507			941	929	502	941	930	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	387			507			941	929	502	941	930	383
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	96	98	95	96	98
cM capacity (veh/h)	1171			1057			229	263	569	229	262	665
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	518	397	32	32								
Volume Left	11	9	11	11								
Volume Right	11	9	11	11								
cSH	1171	1057	302	310								
Volume to Capacity	0.01	0.01	0.10	0.10								
Queue Length 95th (ft)	1	1	9	8								
Control Delay (s)	0.3	0.3	18.3	17.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.3	18.3	17.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay		1.4										
Intersection Capacity Utilization		40.2%			ICU Level of Service		A					
Analysis Period (min)		15										








4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	10	472	10	9	359	9	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	497	11	9	378	9	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)				1160								
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	387			507			936	929	502	936	925	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	332			507			930	923	502	930	919	322
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	96	98	95	96	98
cM capacity (veh/h)	1126			1057			213	243	569	212	244	660
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	518	9	378	9	32	32						
Volume Left	11	9	0	0	11	11						
Volume Right	11	0	0	9	11	11						
cSH	1126	1057	1700	1700	284	291						
Volume to Capacity	0.01	0.01	0.22	0.01	0.11	0.11						
Queue Length 95th (ft)	1	1	0	0	9	9						
Control Delay (s)	0.3	8.4	0.0	0.0	19.3	18.9						
Lane LOS	A	A			C	C						
Approach Delay (s)	0.3	0.2			19.3	18.9						
Approach LOS					C	C						
Intersection Summary												
Average Delay		1.5										
Intersection Capacity Utilization		43.5%			ICU Level of Service		A					
Analysis Period (min)		15										








5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Flt	1.00	0.99		1.00	0.94			0.88			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	
Satd. Flow (prot)	1770	3491		1770	3344			1635			1778	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.35	
Satd. Flow (perm)	1770	3491		1770	3344			1562			644	
Volume (vph)	40	411	41	188	324	189	44	14	396	180	31	11
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	433	43	198	341	199	46	15	417	189	33	12
RTOR Reduction (vph)	0	8	0	0	87	0	0	271	0	0	3	0
Lane Group Flow (vph)	42	468	0	198	453	0	0	207	0	0	231	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	4.1	26.0		12.9	34.8			27.6			27.6	
Effective Green, g (s)	4.6	26.5		13.4	35.3			28.1			28.1	
Actuated g/C Ratio	0.06	0.33		0.17	0.44			0.35			0.35	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	102	1156		296	1476			549			226	
v/s Ratio Prot	0.02	c0.13		c0.11	0.14							
v/s Ratio Perm								0.13			c0.36	
v/c Ratio	0.41	0.40		0.67	0.31			0.38			1.02	
Uniform Delay, d1	36.4	20.7		31.2	14.4			19.4			25.9	
Progression Factor	1.00	1.00		0.93	1.63			1.00			1.03	
Incremental Delay, d2	2.7	1.1		5.0	0.5			0.4			66.1	
Delay (s)	39.1	21.7		33.9	24.0			19.8			92.8	
Level of Service	D	C		C	C			B			F	
Approach Delay (s)		23.1			26.6			19.8			92.8	
Approach LOS		C			C			B			F	
Intersection Summary												
HCM Average Control Delay		31.9			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												













6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	0.95	0.95	1.00	1.00
Flt	1.00	0.96		1.00	0.94			1.00	0.90	0.85	1.00	0.89
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3384		3433	3336			1770	1594	1504	1770	1655
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3384		3433	3336			1770	1594	1504	1770	1655
Volume (vph)	53	661	273	509	439	273	143	105	559	217	41	119
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	696	287	536	462	287	151	111	588	228	43	125
RTOR Reduction (vph)	0	53	0	0	105	0	0	94	226	0	102	0
Lane Group Flow (vph)	56	930	0	536	644	0	151	235	144	228	66	0
Turn Type	Prot			Prot			Prot			Perm	Prot	
Protected Phases	7	4		3	8			5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)	3.3	24.3		14.0	35.0			9.2	13.2	13.2	10.5	14.5
Effective Green, g (s)	3.8	24.8		14.5	35.5			9.7	13.7	13.7	11.0	15.0
Actuated g/C Ratio	0.05	0.31		0.18	0.44			0.12	0.17	0.17	0.14	0.19
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	84	1049		622	1480			215	273	258	243	310
v/s Ratio Prot	0.03	c0.27		c0.16	0.19			0.09	c0.15		c0.13	0.04
v/s Ratio Perm										0.10		
v/c Ratio	0.67	0.89		0.86	0.44			0.70	0.86	0.56	0.94	0.21
Uniform Delay, d1	37.5	26.3		31.8	15.3			33.8	32.2	30.4	34.2	27.5
Progression Factor	1.00	0.88		0.65	1.44			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.5	7.9		6.8	0.1			9.9	27.9	8.4	40.6	1.6
Delay (s)	53.1	30.9		27.3	22.2			43.7	60.1	38.8	74.8	29.1
Level of Service	D	C		C	C			D	E	D	E	C
Approach Delay (s)		32.1			24.3				47.9			55.4
Approach LOS		C			C				D			E
Intersection Summary												
HCM Average Control Delay		35.7			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		83.8%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	0.91	0.91	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	1863	1583	1610	3271	1583	3433	1650	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	1863	1583	1610	3271	1583	3433	1650	
Volume (vph)	151	1031	255	73	441	730	556	103	350	453	70	224
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1085	268	77	464	768	585	108	368	477	74	236
RTOR Reduction (vph)	0	0	137	0	0	536	0	0	104	0	146	0
Lane Group Flow (vph)	159	1085	131	77	464	232	293	400	264	477	164	0
Turn Type	Prot	Perm	Prot	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases		4			8		2					
Actuated Green, G (s)	11.9	27.9	27.9	3.4	19.4	19.4	15.7	15.7	15.7	15.0	15.0	
Effective Green, g (s)	12.4	28.4	28.4	3.9	19.9	19.9	16.2	16.2	16.2	15.5	15.5	
Actuated g/C Ratio	0.16	0.35	0.35	0.05	0.25	0.25	0.20	0.20	0.20	0.19	0.19	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	274	1203	512	86	463	394	326	662	321	665	320	
v/s Ratio Prot	0.09	c0.32		c0.04	0.25		c0.18	0.12		c0.14	0.10	
v/s Ratio Perm			0.09		0.15			0.17				
v/c Ratio	0.58	0.90	0.26	0.90	1.00	0.59	0.90	0.86dl	0.82	0.72	0.51	
Uniform Delay, d1	31.4	24.5	18.3	37.8	30.1	26.5	31.1	29.0	30.5	30.2	28.9	
Progression Factor	1.30	0.90	0.89	1.11	1.01	2.54	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	5.6	0.6	57.2	39.3	5.5	25.8	1.6	15.6	3.7	1.4	
Delay (s)	42.3	27.7	16.8	99.1	69.7	72.6	56.9	30.6	46.1	33.9	30.3	
Level of Service	D	C	B	F	E	E	E	C	D	C	C	
Approach Delay (s)		27.3			73.1			43.2			32.5	
Approach LOS		C			E			D			C	
Intersection Summary												
HCM Average Control Delay		44.6			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		81.5%			ICU Level of Service			D				
Analysis Period (min)		15										
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												
























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3065	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3065	
Volume (vph)	0	1392	445	77	729	0	0	0	0	355	288	512
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1465	468	81	767	0	0	0	0	374	303	539
RTOR Reduction (vph)	0	0	169	0	0	0	0	0	0	0	128	0
Lane Group Flow (vph)	0	1465	299	81	767	0	0	0	0	374	714	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases		4								6		
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	996	
v/s Ratio Prot		c0.41		0.02	c0.22							
v/s Ratio Perm			0.19							0.23	0.23	
v/c Ratio		0.89	0.41	0.39	0.38					0.72	0.87dr	
Uniform Delay, d1		19.6	14.2	36.1	9.2					23.7	23.8	
Progression Factor		0.90	1.44	0.94	0.72					1.00	1.00	
Incremental Delay, d2		4.4	0.9	1.1	0.5					8.1	4.4	
Delay (s)		22.1	21.3	34.9	7.1					31.9	28.2	
Level of Service		C	C	C	A					C	C	
Approach Delay (s)		21.9			9.8				0.0		29.3	
Approach LOS		C			A				A		C	
Intersection Summary												
HCM Average Control Delay		21.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		68.3%			ICU Level of Service			C				
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

















10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00		
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93		
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00		
Satd. Flow (prot)		5085	1583	3433	3520		1681	1693	2787	1770	1723		
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00		
Satd. Flow (perm)		5085	1583	3433	3520		1681	1693	2787	1770	1723		
Volume (vph)	0	805	942	499	459	17	350	18	571	9	9	9	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	847	992	525	483	18	368	19	601	9	9	9	
RTOR Reduction (vph)	0	0	336	0	3	0	0	0	466	0	7	0	
Lane Group Flow (vph)	0	847	656	525	498	0	189	198	135	9	11	0	
Turn Type	Prot	pm+ov			Prot	Split		Perm		Split			
Protected Phases	7	4	2	3	8	2	2			6	6		
Permitted Phases	4					2		2					
Actuated Green, G (s)	17.0	34.5	11.5	33.0		17.5	17.5	17.5	16.0	16.0			
Effective Green, g (s)	17.5	35.5	12.0	33.5		18.0	18.0	18.0	16.5	16.5			
Actuated g/C Ratio	0.22	0.44	0.15	0.42		0.22	0.22	0.22	0.21	0.21			
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	1112	702	515	1474		378	381	627	365	355			
v/s Ratio Prot	0.17	c0.21	c0.15	0.14		0.11	0.12		0.01	c0.01			
v/s Ratio Perm		0.20						0.05					
v/c Ratio	0.76	0.93	1.02	0.34		0.50	0.52	0.22	0.02	0.03			
Uniform Delay, d1	29.3	21.1	34.0	15.7		27.1	27.2	25.3	25.3	25.4			
Progression Factor	1.42	3.80	1.18	1.18		0.85	0.84	1.34	1.00	1.00			
Incremental Delay, d2	2.6	13.0	41.4	0.5		4.5	4.8	0.8	0.1	0.2			
Delay (s)	44.3	93.4	81.6	19.1		27.4	27.8	34.5	25.5	25.5			
Level of Service	D	F	F	B		C	C	C	C	C			
Approach Delay (s)	70.8			51.1			31.8			25.5			
Approach LOS	E			D			C			C			
Intersection Summary													
HCM Average Control Delay			55.3		HCM Level of Service					E			
HCM Volume to Capacity ratio			0.72										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			85.9%		ICU Level of Service					E			
Analysis Period (min)			15										
c Critical Lane Group													

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	 	 	 		 	 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3503		1770	1583
Volume (vph)	137	1251	871	64	102	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	1317	917	67	107	108
RTOR Reduction (vph)	0	0	5	0	0	80
Lane Group Flow (vph)	144	1317	979	0	107	28
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	8.6	50.5	37.4	20.5		20.5
Effective Green, g (s)	9.1	51.0	37.9	21.0		21.0
Actuated g/C Ratio	0.11	0.64	0.47	0.26		0.26
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	391	2256	1660	465		416
v/s Ratio Prot	0.04	c0.37	0.28	c0.06		
v/s Ratio Perm				0.02		
v/c Ratio	0.37	0.58	0.59	0.23		0.07
Uniform Delay, d1	32.8	8.4	15.4	23.2		22.2
Progression Factor	0.81	2.26	1.00	1.00		1.00
Incremental Delay, d2	0.4	0.8	1.5	1.2		0.3
Delay (s)	27.1	19.7	16.9	24.3		22.5
Level of Service	C	B	B	C		C
Approach Delay (s)	20.4		16.9	23.4		
Approach LOS	C		B	C		
Intersection Summary						
HCM Average Control Delay	19.4			HCM Level of Service		B
HCM Volume to Capacity ratio	0.48					
Actuated Cycle Length (s)	80.0			Sum of lost time (s)		8.0
Intersection Capacity Utilization	46.9%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↲	↰	↱	↲	↰	↱	↲	↰	↱	↲
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1687	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	338	3	47	8	3	5	552	413	2	7	616	820
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	356	3	49	8	3	5	581	435	2	7	648	863
RTOR Reduction (vph)	0	0	40	0	5	0	0	0	0	0	0	505
Lane Group Flow (vph)	178	181	9	0	11	0	581	437	0	7	648	358
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.6	13.6	13.6		1.5		27.1	45.4		1.5	19.8	19.8
Effective Green, g (s)	14.1	14.1	14.1		2.0		27.6	45.9		2.0	20.3	20.3
Actuated g/C Ratio	0.18	0.18	0.18		0.02		0.35	0.57		0.02	0.25	0.25
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	296	297	279		44		611	2029		44	898	402
v/s Ratio Prot	0.11	c0.11		c0.01	c0.33	0.12		0.00	0.18			
v/s Ratio Perm			0.01								c0.23	
v/c Ratio	0.60	0.61	0.03		0.25		0.95	0.22		0.16	0.72	0.89
Uniform Delay, d1	30.4	30.4	27.3		38.3		25.5	8.3		38.2	27.3	28.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.27	1.05	2.24
Incremental Delay, d2	3.4	3.5	0.0		3.0		24.8	0.2		0.5	1.4	8.6
Delay (s)	33.8	33.9	27.3		41.3		50.3	8.5		48.9	30.2	73.1
Level of Service	C	C	C		D		D	A		D	C	E
Approach Delay (s)		33.1			41.3			32.4			54.7	
Approach LOS		C			D			C			D	
Intersection Summary												
HCM Average Control Delay		44.0			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		94.7%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												














13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↲	↲	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583	1863	1583		1863
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1770	1583	1863	1583		1863
Volume (vph)	116	37	765	63	0	664
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	122	39	805	66	0	699
RTOR Reduction (vph)	0	33	0	19	0	0
Lane Group Flow (vph)	122	6	805	47	0	699
Turn Type	Perm		Perm			
Protected Phases	8		2			6
Permitted Phases		8		2		
Actuated Green, G (s)	9.7	9.7	45.2	45.2		45.2
Effective Green, g (s)	10.2	10.2	45.7	45.7		45.7
Actuated g/C Ratio	0.16	0.16	0.72	0.72		0.72
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	283	253	1332	1132		1332
v/s Ratio Prot	c0.07		c0.43			0.38
v/s Ratio Perm		0.00		0.03		
v/c Ratio	0.43	0.02	0.60	0.04		0.52
Uniform Delay, d1	24.2	22.7	4.6	2.7		4.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.1	0.0	0.8	0.0		0.4
Delay (s)	25.3	22.7	5.3	2.7		4.5
Level of Service	C	C	A	A		A
Approach Delay (s)	24.7		5.1			4.5
Approach LOS	C		A			A
Intersection Summary						
HCM Average Control Delay		6.7		HCM Level of Service		A
HCM Volume to Capacity ratio		0.57				
Actuated Cycle Length (s)		63.9		Sum of lost time (s)		8.0
Intersection Capacity Utilization		53.4%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations				 	 		
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	144	31	12	359	363	25	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	152	33	13	378	382	26	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	609	204	408				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	609	204	408				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	64	96	99				
cM capacity (veh/h)	422	803	1147				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	152	33	13	189	189	255	154
Volume Left	152	0	13	0	0	0	0
Volume Right	0	33	0	0	0	0	26
cSH	422	803	1147	1700	1700	1700	1700
Volume to Capacity	0.36	0.04	0.01	0.11	0.11	0.15	0.09
Queue Length 95th (ft)	40	3	1	0	0	0	0
Control Delay (s)	18.2	9.7	8.2	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	16.7		0.3			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay	3.2						
Intersection Capacity Utilization	25.5%			ICU Level of Service		A	
Analysis Period (min)	15						

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↩	↩	↩	↩	↩	↩
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	253	264	563	253	275	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	266	278	593	266	289	533
RTOR Reduction (vph)	0	217	0	151	0	0
Lane Group Flow (vph)	266	61	593	115	289	533
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	13.2	13.2	26.6	26.6	9.5	40.6
Effective Green, g (s)	13.7	13.7	27.1	27.1	10.0	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	345	804	683	282	1219
v/s Ratio Prot	c0.15		c0.32		c0.16	0.29
v/s Ratio Perm		0.04		0.07		
v/c Ratio	0.69	0.18	0.74	0.17	1.02	0.44
Uniform Delay, d1	22.6	20.0	14.9	10.9	26.4	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	0.2	6.0	0.5	60.1	1.1
Delay (s)	27.7	20.2	20.9	11.5	86.5	6.4
Level of Service	C	C	C	B	F	A
Approach Delay (s)	23.8		18.0			34.6
Approach LOS	C		B			C
Intersection Summary						
HCM Average Control Delay		25.5		HCM Level of Service		C
HCM Volume to Capacity ratio		0.78				
Actuated Cycle Length (s)		62.8		Sum of lost time (s)		12.0
Intersection Capacity Utilization		68.9%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1577	1504	1770	1665	
Volume (vph)	83	655	53	116	539	92	69	26	153	281	40	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	689	56	122	567	97	73	27	161	296	42	102
RTOR Reduction (vph)	0	0	44	0	0	76	0	57	70	0	55	0
Lane Group Flow (vph)	87	689	12	122	567	21	73	42	19	296	89	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.5	16.7	16.7	4.4	16.6	16.6	4.4	16.5	16.5	24.4	36.5	
Effective Green, g (s)	5.0	17.2	17.2	4.9	17.1	17.1	4.9	17.0	17.0	24.9	37.0	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.21	0.21	0.31	0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	111	761	340	210	756	338	210	335	320	551	770	
v/s Ratio Prot	0.05	c0.19		0.04	c0.16		c0.02	c0.03		c0.17	0.05	
v/s Ratio Perm			0.01			0.01			0.01			
v/c Ratio	0.78	0.91	0.04	0.58	0.75	0.06	0.35	0.13	0.06	0.54	0.12	
Uniform Delay, d1	37.0	30.6	24.8	36.6	29.4	25.1	36.0	25.5	25.1	22.8	12.2	
Progression Factor	1.00	1.00	1.00	0.82	0.56	0.29	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	29.4	14.2	0.0	3.2	3.3	0.1	1.0	0.8	0.4	1.0	0.3	
Delay (s)	66.4	44.9	24.9	33.3	20.0	7.3	37.0	26.3	25.5	23.8	12.5	
Level of Service	E	D	C	C	B	A	D	C	C	C	B	
Approach Delay (s)		45.8			20.5			29.0			20.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay		30.4			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		54.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3222	1441	3433	1863	1583
Volume (vph)	216	770	163	377	650	318	173	326	510	339	301	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	227	811	172	397	684	335	182	343	537	357	317	248
RTOR Reduction (vph)	0	0	115	0	0	227	0	70	264	0	0	198
Lane Group Flow (vph)	227	811	57	397	684	108	182	443	103	357	317	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.1	25.8	25.8	11.5	25.2	25.2	9.0	15.0	15.0	9.7	15.7	15.7
Effective Green, g (s)	12.6	26.3	26.3	12.0	25.7	25.7	9.5	15.5	15.5	10.2	16.2	16.2
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.19	0.19	0.13	0.20	0.20
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	1672	520	515	1137	509	210	624	279	438	377	321
v/s Ratio Prot	c0.13	0.16		c0.12	c0.19		0.10	0.14		c0.10	c0.17	
v/s Ratio Perm			0.04			0.07			0.07			0.03
v/c Ratio	0.81	0.49	0.11	0.77	0.60	0.21	0.87	0.71	0.37	0.82	0.84	0.16
Uniform Delay, d1	32.6	21.4	18.7	32.7	22.8	19.8	34.6	30.1	28.0	34.0	30.7	26.3
Progression Factor	0.78	0.55	0.42	0.90	0.84	1.17	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.3	0.7	0.3	5.9	2.0	0.8	29.1	3.7	0.8	11.1	15.4	0.2
Delay (s)	37.7	12.5	8.2	35.2	21.3	23.9	63.7	33.9	28.8	45.1	46.1	26.5
Level of Service	D	B	A	D	C	C	E	C	C	D	D	C
Approach Delay (s)		16.6			25.8			37.2			40.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM Average Control Delay		29.0			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		68.7%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2020 + Alternative E (Mitigated)

Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑↑↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Flt	0.97	1.00	1.00	1.00	0.85	0.90	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	0.95	1.00	1.00	1.00	0.99	0.95	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	4934	1770	3539	1583	1583	1653	1681	1686	1583	1686	1583	1583
Flt Permitted	1.00	0.95	1.00	1.00	1.00	0.92	0.74	0.71	1.00	0.74	0.71	1.00
Satd. Flow (perm)	4934	1770	3539	1583	1583	1548	1312	1255	1583	1312	1255	1583
Volume (vph)	0	1298	320	68	909	255	6	0	17	611	1	427
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1366	337	72	957	268	6	0	18	643	1	449
RTOR Reduction (vph)	0	48	0	0	0	0	0	12	0	0	0	71
Lane Group Flow (vph)	0	1655	0	72	957	268	0	12	0	322	322	378
Turn Type				Prot		Free	Perm			Perm		Perm
Protected Phases	4			3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)	37.0			5.0	46.5	80.0		24.5		24.5	24.5	24.5
Effective Green, g (s)	37.5			5.5	47.0	80.0		25.0		25.0	25.0	25.0
Actuated g/C Ratio	0.47			0.07	0.59	1.00		0.31		0.31	0.31	0.31
Clearance Time (s)	4.5			4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	2313			122	2079	1583		484		410	392	495
v/s Ratio Prot	c0.34			c0.04	0.27							
v/s Ratio Perm						0.17		0.01		0.25	c0.26	0.24
v/c Ratio	0.72			0.59	0.46	0.17		0.02		0.79	0.82	0.76
Uniform Delay, d1	17.0			36.2	9.3	0.0		19.0		25.1	25.4	24.8
Progression Factor	0.45			0.76	1.56	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5			6.9	0.7	0.2		0.0		9.5	13.0	6.9
Delay (s)	9.2			34.3	15.2	0.2		19.1		34.6	38.4	31.7
Level of Service	A			C	B	A		B		C	D	C
Approach Delay (s)	9.2				13.2			19.1			34.5	
Approach LOS	A				B			B			C	
Intersection Summary												
HCM Average Control Delay		17.2										
HCM Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		80.0						12.0				
Intersection Capacity Utilization		69.6%										
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2020 + Alternative E (Mitigated)
























Graton Rancheria Casino & Hotel

PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↑	↑↑↑	↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.85	1.00	0.85	0.85	1.00	0.85	0.85	0.98
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.96
Satd. Flow (prot)	1770	6408	1583	5085	1583	3433	1504	1504	1748	1504	1504	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.78	1.00	1.00	0.78
Satd. Flow (perm)	1770	6408	1583	5085	1583	2695	1504	1504	1417	1504	1504	1417
Volume (vph)	21	1602	298	0	857	383	370	0	345	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1686	314	0	902	403	389	0	363	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	2	2	0	2	0	0
Lane Group Flow (vph)	22	1686	314	0	902	403	389	179	180	0	16	0
Turn Type				Prot		Free		Free	Perm		Perm	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases					Free		Free	2		2		6
Actuated Green, G (s)	2.2	55.0	80.0		48.3	80.0	16.0	16.0	16.0		16.0	
Effective Green, g (s)	2.7	55.5	80.0		48.8	80.0	16.5	16.5	16.5		16.5	
Actuated g/C Ratio	0.03	0.69	1.00		0.61	1.00	0.21	0.21	0.21		0.21	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	60	4446	1583		3102	1583	556	310	310		292	
v/s Ratio Prot	0.01	c0.26			0.18			0.12				
v/s Ratio Perm			0.20			0.25	c0.14		0.12		0.01	
v/c Ratio	0.37	0.38	0.20		0.29	0.25	0.70	0.58	0.58		0.05	
Uniform Delay, d1	37.8	5.1	0.0		7.4	0.0	29.5	28.6	28.6		25.5	
Progression Factor	1.11	1.15	1.00		1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.5	0.2	0.2		0.2	0.4	3.8	2.6	2.8		0.1	
Delay (s)	44.6	6.0	0.2		7.6	0.4	33.3	31.2	31.4		25.6	
Level of Service	D	A	A		A	A	C	C	C		C	
Approach Delay (s)		5.6			5.4			32.3			25.6	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM Average Control Delay		10.5										
HCM Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		80.0						8.0				
Intersection Capacity Utilization		50.8%										
Analysis Period (min)		15										
c Critical Lane Group												


























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	4914		1610	3330	1583	1610	3387	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	4914		1610	3330	1583	1610	3387	1583
Volume (vph)	235	1267	462	165	698	202	384	293	241	179	354	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1334	486	174	735	213	404	308	254	188	373	160
RTOR Reduction (vph)	0	0	339	0	64	0	0	0	203	0	0	130
Lane Group Flow (vph)	247	1334	147	174	884	0	229	483	51	181	380	30
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	7.5	22.6	22.6	7.5	22.6		14.7	14.7	14.7	13.6	13.6	13.6
Effective Green, g (s)	8.0	23.1	23.1	8.0	23.1		15.2	15.2	15.2	14.1	14.1	14.1
Actuated g/C Ratio	0.10	0.30	0.30	0.10	0.30		0.20	0.20	0.20	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	359	1537	479	185	1486		320	663	315	297	625	292
v/s Ratio Prot	0.07	c0.26		c0.10	0.18		0.14	c0.15		c0.11	0.11	
v/s Ratio Perm			0.09						0.03			0.02
v/c Ratio	0.69	0.87	0.31	0.94	0.59		0.72	0.73	0.16	0.61	0.61	0.10
Uniform Delay, d1	33.0	25.2	20.5	34.0	22.7		28.6	28.7	25.3	28.6	28.6	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	6.9	1.7	49.1	1.8		7.4	4.0	0.2	3.5	1.7	0.2
Delay (s)	38.4	32.1	22.1	83.0	24.4		36.0	32.7	25.6	32.1	30.3	26.0
Level of Service	D	C	C	F	C		D	C	C	C	C	C
Approach Delay (s)		30.5			33.5			31.6			29.8	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay	31.3			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	76.4			Sum of lost time (s)					16.0			
Intersection Capacity Utilization	69.8%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3390		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3390		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	149	583	228	140	661	129	323	483	113	153	358	235
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	614	240	147	696	136	340	508	119	161	377	247
RTOR Reduction (vph)	0	59	0	0	0	103	0	0	78	0	0	181
Lane Group Flow (vph)	157	795	0	147	696	33	340	508	41	161	377	66
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.5	16.5		5.5	16.5	16.5	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	17.0		6.0	17.0	17.0	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.34	0.34	0.10	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	823		152	859	384	354	639	543	177	452	384
v/s Ratio Prot	c0.09	c0.23		0.08	0.20		c0.19	c0.27		0.09	0.20	
v/s Ratio Perm						0.02			0.03			0.04
v/c Ratio	1.03	0.97		0.97	0.81	0.09	0.96	0.79	0.08	0.91	0.83	0.17
Uniform Delay, d1	32.0	26.2		31.9	25.0	20.5	27.7	20.8	15.5	31.2	25.2	20.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.0	23.1		62.4	5.8	0.1	37.3	9.9	0.3	42.2	16.4	1.0
Delay (s)	114.0	49.3		94.3	30.8	20.6	65.0	30.6	15.8	73.4	41.6	21.9
Level of Service	F	D		F	C	C	E	C	B	E	D	C
Approach Delay (s)	59.4			38.9			40.9			41.9		
Approach LOS	E			D			D			D		
Intersection Summary												
HCM Average Control Delay	45.6			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.89											
Actuated Cycle Length (s)	70.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	81.2%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↱	↰	↱	↱	↰	↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Flt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3517		1770	3539	1583	1770	1672		1770	1639	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3517		1770	3539	1583	1770	1672		1770	1639	
Volume (vph)	122	754	32	53	813	406	48	28	59	592	28	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	794	34	56	856	427	51	29	62	623	29	116
RTOR Reduction (vph)	0	4	0	0	0	164	0	57	0	0	61	0
Lane Group Flow (vph)	128	824	0	56	856	263	51	34	0	623	84	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.5	21.8		4.4	20.7	20.7	3.3	6.4		39.4	42.5	
Effective Green, g (s)	6.0	22.3		4.9	21.2	21.2	3.8	6.9		39.9	43.0	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	871		96	834	373	75	128		785	783	
v/s Ratio Prot	0.07	c0.23		0.03	c0.24		c0.03	0.02		c0.35	c0.05	
v/s Ratio Perm						0.17						
v/c Ratio	1.08	0.95		0.58	1.03	0.71	0.68	0.26		0.79	0.11	
Uniform Delay, d1	42.0	33.3		41.6	34.4	31.5	42.5	39.2		21.5	12.9	
Progression Factor	1.00	1.00		0.67	0.60	0.24	1.00	1.00		1.00	1.00	
Incremental Delay, d2	107.4	20.0		7.7	36.1	9.5	22.4	1.1		5.5	0.1	
Delay (s)	149.4	53.2		35.6	56.7	16.9	64.9	40.3		27.1	13.0	
Level of Service	F	D		D	E	B	E	D		C	B	
Approach Delay (s)		66.1			43.1			49.1			24.4	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM Average Control Delay		45.8							D			
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		90.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		79.1%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												














24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱	↱	↰	↱	↱		↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						0.97	1.00
Flt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3539	1583	1770	3539						3433	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1583	1770	3539						3433	1583
Volume (vph)	0	953	458	66	1014	0	0	0	0	640	0	258
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1003	482	69	1067	0	0	0	0	674	0	272
RTOR Reduction (vph)	0	0	104	0	0	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	1003	378	69	1067	0	0	0	0	674	205	0
Turn Type			Perm		Prot						Prot	
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.28		0.04	c0.30					c0.20	0.13	
v/s Ratio Perm			0.24									
v/c Ratio		0.69	0.58	0.29	0.51					0.61	0.40	
Uniform Delay, d1		21.9	20.6	35.1	10.9					25.7	23.7	
Progression Factor		0.47	0.43	1.21	1.56					1.00	1.00	
Incremental Delay, d2		1.5	2.1	0.6	0.9					1.0	2.3	
Delay (s)		11.8	10.9	43.2	17.9					26.7	26.1	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		11.5			19.4				0.0		26.5	
Approach LOS		B			B				A		C	
Intersection Summary												
HCM Average Control Delay			18.0							B		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			67.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	 			 	 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1596	0	0	683	391	273
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1680	0	0	719	412	287
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1680	0	0	719	412	273
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	60.8			60.8	20.2	20.2
Effective Green, g (s)	61.3			61.3	20.7	20.7
Actuated g/C Ratio	0.68			0.68	0.23	0.23
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2410			2410	790	364
v/s Ratio Prot	c0.47			0.20	0.12	
v/s Ratio Perm				c0.17		
v/c Ratio	0.70			0.30	0.52	0.75
Uniform Delay, d1	8.7			5.7	30.3	32.2
Progression Factor	0.35			1.00	1.00	1.00
Incremental Delay, d2	1.3			0.3	0.6	8.4
Delay (s)	4.3			6.1	30.9	40.7
Level of Service	A			A	C	D
Approach Delay (s)	4.3			6.1	34.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			11.6	HCM Level of Service		B
HCM Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			67.7%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↖	↖	↖	↖	↖	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1741			1819	1583	1770	3539	1583	1770	3533	
Flt Permitted		0.84			0.84	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1505			1562	1583	1770	3539	1583	1770	3533	
Volume (vph)	11	5	8	23	25	228	7	765	26	132	601	7
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	5	8	24	26	240	7	805	27	139	633	7
RTOR Reduction (vph)	0	7	0	0	0	208	0	0	14	0	1	0
Lane Group Flow (vph)	0	18	0	0	50	32	7	805	14	139	639	0
Turn Type	Perm			Perm		Perm	Prot	Perm		Prot		
Protected Phases	4			8		8	5	2	1		6	
Permitted Phases	4			8		8	2					
Actuated Green, G (s)	6.5			6.5		6.5	1.0	25.7	25.7	6.7	31.4	
Effective Green, g (s)	7.0			7.0		7.0	1.5	26.2	26.2	7.2	31.9	
Actuated g/C Ratio	0.13			0.13		0.13	0.03	0.50	0.50	0.14	0.61	
Clearance Time (s)	4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	201			209		211	51	1770	792	243	2151	
v/s Ratio Prot							0.00	c0.23		c0.08	0.18	
v/s Ratio Perm	0.01			c0.03		0.02	0.01					
v/c Ratio	0.09			0.24		0.15	0.14	0.45	0.02	0.57	0.30	
Uniform Delay, d1	19.9			20.3		20.1	24.8	8.5	6.6	21.2	4.9	
Progression Factor	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2			0.6		0.3	1.2	0.2	0.0	3.2	0.1	
Delay (s)	20.1			20.9		20.4	26.1	8.7	6.6	24.4	5.0	
Level of Service	C			C		C	C	A	A	C	A	
Approach Delay (s)	20.1			20.5		8.7			8.4			
Approach LOS	C			C		A			A			
Intersection Summary												
HCM Average Control Delay	10.5			HCM Level of Service					B			
HCM Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	52.4			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	48.6%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	161	5	7	265	2	10	0	2	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	169	5	7	279	2	11	0	2	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)		1180										
pX, platoon unblocked												
vC, conflicting volume	281			175			469	470	172	471	472	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			175			469	470	172	471	472	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	100	100	100	100
cM capacity (veh/h)	1281			1402			501	489	872	499	488	759
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	288	13	1								
Volume Left	1	7	11	0								
Volume Right	5	2	2	0								
cSH	1281	1402	539	488								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.2	11.8	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.8	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		32.9%		ICU Level of Service		A						
Analysis Period (min)		15										

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	146	2	4	279	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	154	2	4	294	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			156			464	467	155	468	464	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			156			464	467	155	468	464	298
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1259			1424			506	491	891	497	493	742
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	306	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1259	1424	493	532								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.5	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.5	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization		27.8%		ICU Level of Service		A						
Analysis Period (min)		15										

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel











2020 + Alternative E (Mitigated)
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↙	↘
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	154	27	7	331	27	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	28	7	348	28	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			191		539	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		539	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1383		500	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	191	356	55			
Volume Left	0	7	28			
Volume Right	28	0	26			
cSH	1700	1383	628			
Volume to Capacity	0.11	0.01	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.2	11.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		33.0%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Volume (veh/h)	0	160	23	36	225	0	114	0	26	0	0	0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	0	168	24	38	237	0	120	0	27	0	0	0	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								None			None		
Median storage veh													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	237				193			493	493	181	521	505	237
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	237				193			493	493	181	521	505	237
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100				97			75	100	97	100	100	100
cM capacity (veh/h)	1330				1381			476	464	862	442	457	802
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	193	275	147	0									
Volume Left	0	38	120	0									
Volume Right	24	0	27	0									
cSH	1330	1381	519	1700									
Volume to Capacity	0.00	0.03	0.28	0.00									
Queue Length 95th (ft)	0	2	29	0									
Control Delay (s)	0.0	1.3	14.7	0.0									
Lane LOS		A	B	A									
Approach Delay (s)	0.0	1.3	14.7	0.0									
Approach LOS			B	A									
Intersection Summary													
Average Delay			4.1										
Intersection Capacity Utilization		41.6%			ICU Level of Service				A				
Analysis Period (min)		15											

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	131	51	0	235	55	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	138	54	0	247	58	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			192		412	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		412	165
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1382		596	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	192	247	58			
Volume Left	0	0	58			
Volume Right	54	0	0			
cSH	1700	1382	596			
Volume to Capacity	0.11	0.00	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	11.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)			15			

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	174	141	15	830	124	538
v/c Ratio	0.09	0.69	0.37	0.11	0.77	0.79	0.40
Control Delay	16.9	41.5	11.6	38.0	18.9	70.5	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	41.5	11.6	38.0	18.9	70.5	7.5
Queue Length 50th (ft)	5	68	10	6	275	53	87
Queue Length 95th (ft)	27	145	58	25	470	#164	234
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	407	311	447	139	1139	156	1352
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.56	0.32	0.11	0.73	0.79	0.40
Intersection Summary							
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							







2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	217	397	359	33
v/c Ratio	0.29	0.59	0.41	0.05
Control Delay	6.2	10.3	4.0	7.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.2	10.3	4.0	7.9
Queue Length 50th (ft)	13	31	3	2
Queue Length 95th (ft)	53	111	49	17
Internal Link Dist (ft)	1130	2170	446	2150
Turn Bay Length (ft)				
Base Capacity (vph)	1138	1034	1106	952
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.38	0.32	0.03
Intersection Summary				










5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	42	476	198	540	478	234
v/c Ratio	0.27	0.41	0.67	0.33	0.58	0.84
Control Delay	39.0	24.0	39.2	20.2	5.9	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	24.0	39.2	20.2	5.9	48.9
Queue Length 50th (ft)	20	100	92	107	19	101
Queue Length 95th (ft)	52	158 m#159	156	74 m#172		
Internal Link Dist (ft)		1080		1070	911	2200
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	153	1163	325	1631	933	354
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.41	0.61	0.33	0.51	0.66
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						
m Volume for 95th percentile queue is metered by upstream signal.						

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	56	983	536	749	151	329	370	228	168
v/c Ratio	0.40	0.96	0.86	0.47	0.71	0.82	0.72	0.94	0.38
Control Delay	43.1	42.0	32.7	19.3	53.1	37.3	17.2	81.1	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	42.0	32.7	19.3	53.1	37.3	17.2	81.1	11.0
Queue Length 50th (ft)	29	144	147	176	73	105	42	115	17
Queue Length 95th (ft)	m53	m#348	m#194	m200	#156	#229	140	#247	65
Internal Link Dist (ft)		1070		550		687			2220
Turn Bay Length (ft)	150		150						
Base Capacity (vph)	139	1029	621	1586	221	447	550	243	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.96	0.86	0.47	0.68	0.74	0.67	0.94	0.34
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	159	1085	268	77	464	768	293	400	368	477	310
v/c Ratio	0.58	0.87	0.40	0.68	1.00	0.83	0.90	0.86dl	0.87	0.72	0.67
Control Delay	44.1	28.3	5.8	68.4	74.1	16.7	63.1	33.3	42.1	36.8	20.0
Queue Delay	0.0	28.2	0.0	0.0	20.4	1.5	0.0	0.0	260.1	0.0	0.0
Total Delay	44.1	56.5	5.8	68.4	94.6	18.2	63.1	33.3	302.3	36.8	20.0
Queue Length 50th (ft)	80	258	18	42	~260	121	157	100	117	113	56
Queue Length 95th (ft)	m86	m#383	m29	m#93	m#488	#348	#310	147	#270	163	140
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	365	1243	663	114	465	930	332	675	430	708	484
Starvation Cap Reductn	0	0	0	0	29	55	0	0	0	0	0
Spillback Cap Reductn	0	211	0	0	0	0	0	0	197	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.05	0.40	0.68	1.06	0.88	0.88	0.59	1.58	0.67	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↖	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1465	468	81	767	374	842
v/c Ratio	0.87	0.51	0.32	0.38	0.72	0.87dr
Control Delay	22.4	8.5	36.2	7.2	32.9	23.3
Queue Delay	66.5	1.3	0.0	0.0	0.3	2.5
Total Delay	88.9	9.8	36.2	7.3	33.2	25.8
Queue Length 50th (ft)	321	97	17	37	179	158
Queue Length 95th (ft)	m#487	m129	m38	75	#292	231
Internal Link Dist (ft)	220		466			348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	918	257	2035	523	1124
Starvation Cap Reductn	402	255	0	0	0	0
Spillback Cap Reductn	5	0	0	147	13	169
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.71	0.32	0.41	0.73	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	847	992	525	501	189	198	601	9	18
v/c Ratio	0.76	0.96	1.02	0.34	0.50	0.52	0.55	0.02	0.05
Control Delay	44.6	29.3	82.6	19.1	28.0	28.4	5.4	25.7	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	44.6	29.3	82.6	19.1	28.0	28.4	5.7	25.7	18.8
Queue Length 50th (ft)	169	360	~152	129	64	67	0	4	4
Queue Length 95th (ft)	m191	m#566	#253	177	127	131	66	16	21
Internal Link Dist (ft)	466		345		380			270	
Turn Bay Length (ft)			150		150		200		
Base Capacity (vph)	1112	1038	515	1478	378	381	1093	365	363
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	140	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.96	1.02	0.34	0.50	0.52	0.63	0.02	0.05
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									










11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	↘	→	←	↙	↖
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	144	1317	984	107	108
v/c Ratio	0.37	0.58	0.59	0.23	0.22
Control Delay	28.3	20.2	17.3	24.8	6.3
Queue Delay	0.0	2.2	0.0	0.0	0.0
Total Delay	28.3	22.4	17.3	24.8	6.3
Queue Length 50th (ft)	39	293	178	42	0
Queue Length 95th (ft)	m58	367	251	83	36
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1666	465	495
Starvation Cap Reductn	0	760	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.88	0.59	0.23	0.22
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					






12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	178	181	49	16	581	437	7	648	863
v/c Ratio	0.60	0.61	0.15	0.11	1.09	0.19	0.05	0.53	0.87
Control Delay	38.1	38.4	9.0	29.3	96.8	8.3	42.6	26.8	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Total Delay	38.1	38.4	9.0	29.3	96.8	8.3	42.6	26.8	18.3
Queue Length 50th (ft)	87	89	0	5	~333	28	3	155	202
Queue Length 95th (ft)	140	141	25	23	#524	122	m3	m#231	m#255
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	452	179	531	2347	177	1217	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	49
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.41	0.11	0.09	1.09	0.19	0.04	0.53	0.92
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

					
Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	122	39	805	66	699
v/c Ratio	0.41	0.13	0.60	0.06	0.52
Control Delay	19.7	7.8	7.9	1.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	7.8	7.9	1.4	6.7
Queue Length 50th (ft)	28	0	108	0	85
Queue Length 95th (ft)	72	19	258	10	199
Internal Link Dist (ft)	306		2550		954
Turn Bay Length (ft)					
Base Capacity (vph)	461	441	1362	1175	1362
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.09	0.59	0.06	0.51
Intersection Summary					

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	266	278	593	266	289	533
v/c Ratio	0.69	0.49	0.74	0.32	1.02	0.44
Control Delay	32.6	6.4	22.7	3.1	91.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	6.4	22.7	3.1	91.6	7.1
Queue Length 50th (ft)	94	0	188	0	~126	89
Queue Length 95th (ft)	164	52	#352	38	#264	152
Internal Link Dist (ft)	480		3920		2550	
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	599	803	834	282	1219
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.46	0.74	0.32	1.02	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	87	689	56	122	567	97	73	99	89	296	144
v/c Ratio	0.64	0.91	0.15	0.47	0.75	0.23	0.28	0.23	0.21	0.56	0.17
Control Delay	58.8	49.1	8.8	34.4	22.6	2.9	38.1	12.0	7.8	28.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	49.1	8.8	34.4	22.6	2.9	38.1	12.0	7.8	28.4	5.5
Queue Length 50th (ft)	43	178	0	19	112	1	18	11	0	123	12
Queue Length 95th (ft)	#111	#280	29	m40	m147	m4	38	52	37	202	43
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	136	757	382	257	757	415	257	427	423	531	862
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.91	0.15	0.47	0.75	0.23	0.28	0.23	0.21	0.56	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	811	172	397	684	335	182	513	367	357	317	248
v/c Ratio	0.81	0.49	0.27	0.77	0.60	0.46	0.87	0.74	0.67	0.81	0.84	0.48
Control Delay	44.2	12.7	2.3	39.3	21.8	5.0	73.5	31.9	12.1	51.7	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	12.7	2.3	39.3	21.8	5.0	73.5	31.9	12.1	51.7	51.3	7.3
Queue Length 50th (ft)	71	59	4	106	176	40	92	108	17	92	151	0
Queue Length 95th (ft) m#111	m66	m7	m#160	m230	m42	#210	163	107	#172	#279	57	
Internal Link Dist (ft)	320			520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1669	636	515	1134	735	210	753	565	439	396	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.49	0.27	0.77	0.60	0.46	0.87	0.68	0.65	0.81	0.80	0.47
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1703	72	957	268	24	322	322	449
v/c Ratio	0.71	0.49	0.46	0.17	0.05	0.78	0.82	0.79
Control Delay	9.2	38.8	16.8	0.2	9.5	38.5	42.5	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	38.8	16.8	0.2	9.5	38.5	42.5	29.6
Queue Length 50th (ft)	146	36	199	0	2	143	146	149
Queue Length 95th (ft)	185	m#60	298	m0	17	238	#267	255
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2415	146	2078	1583	576	476	455	640
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.49	0.46	0.17	0.04	0.68	0.71	0.70
Intersection Summary								
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								
m Volume for 95th percentile queue is metered by upstream signal.								

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	22	1686	314	902	403	389	181	182	18
v/c Ratio	0.17	0.38	0.20	0.28	0.25	0.70	0.58	0.59	0.06
Control Delay	40.8	6.6	0.2	7.9	0.4	36.0	35.2	35.3	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	6.6	0.2	7.9	0.4	36.0	35.2	35.3	20.5
Queue Length 50th (ft)	12	125	0	50	0	93	86	86	6
Queue Length 95th (ft)	m16	190	m0	125	0	125	136	138	21
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	4449	1583	3276	1583	1415	791	791	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.38	0.20	0.28	0.25	0.27	0.23	0.23	0.02
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	247	1334	486	174	948	229	483	254	181	380	160
v/c Ratio	0.69	0.87	0.59	0.94	0.61	0.71	0.73	0.49	0.61	0.61	0.38
Control Delay	45.1	33.7	5.8	90.3	23.1	42.9	36.1	7.5	38.5	33.4	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	33.7	5.8	90.3	23.1	42.9	36.1	7.5	38.5	33.4	7.8
Queue Length 50th (ft)	61	229	0	87	132	115	121	0	90	93	0
Queue Length 95th (ft)	#112	#321	68	#211	179	#220	178	58	159	139	47
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	360	1535	817	186	1547	342	708	537	337	710	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.87	0.59	0.94	0.61	0.67	0.68	0.47	0.54	0.54	0.35
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	854	147	696	136	340	508	119	161	377	247
v/c Ratio	1.03	0.97	0.97	0.81	0.28	0.96	0.79	0.19	0.91	0.83	0.44
Control Delay	118.8	49.3	102.1	34.1	6.2	70.2	32.2	4.5	83.1	43.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	49.3	102.1	34.1	6.2	70.2	32.2	4.5	83.1	43.6	6.5
Queue Length 50th (ft)	~72	176	65	148	0	146	194	0	70	154	3
Queue Length 95th (ft)	#183	#295	#170	#230	39	#298	#346	31	#176	#292	54
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	152	883	152	859	487	354	639	621	177	452	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.97	0.97	0.81	0.28	0.96	0.79	0.19	0.91	0.83	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	828	56	856	427	51	91	623	145
v/c Ratio	1.08	0.84	0.47	0.95	0.76	0.43	0.44	0.81	0.17
Control Delay	150.1	41.0	39.1	39.6	12.5	52.2	22.9	34.4	5.2
Queue Delay	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	150.1	41.5	39.1	39.6	13.0	52.2	22.9	34.4	5.2
Queue Length 50th (ft)	~82	240	31	247	5	28	16	310	9
Queue Length 95th (ft)	#194	#354	m58	#361	#111	65	59	#556	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	118	981	118	904	564	118	366	767	844
Starvation Cap Reductn	0	0	0	0	16	0	0	0	0
Spillback Cap Reductn	0	22	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.86	0.47	0.95	0.78	0.43	0.25	0.81	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1003	482	69	1067	674	272
v/c Ratio	0.67	0.63	0.27	0.51	0.61	0.47
Control Delay	12.1	8.3	42.6	18.1	28.6	18.3
Queue Delay	0.4	0.5	0.0	0.3	0.0	0.0
Total Delay	12.5	8.8	42.6	18.4	28.6	18.3
Queue Length 50th (ft)	151	87	38	253	164	75
Queue Length 95th (ft)	m181	m121	m78	314	222	148
Internal Link Dist (ft)	350		370		585	
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	767	295	2084	1106	577
Starvation Cap Reductn	138	65	0	404	0	0
Spillback Cap Reductn	34	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.69	0.23	0.64	0.61	0.47
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative E (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1680	719	412	287
v/c Ratio	0.70	0.30	0.52	0.76
Control Delay	4.9	7.0	31.7	42.5
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	4.9	7.0	31.7	42.5
Queue Length 50th (ft)	189	75	105	143
Queue Length 95th (ft)	250	137	131	205
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2409	2409	1221	574
Starvation Cap Reductn	61	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.30	0.34	0.50
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel




















2020 + Alternative E (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	50	240	7	805	27	139	640
v/c Ratio	0.09	0.18	0.52	0.04	0.46	0.03	0.47	0.27
Control Delay	15.1	18.8	7.8	23.1	11.7	4.9	23.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	18.8	7.8	23.1	11.7	4.9	23.4	5.4
Queue Length 50th (ft)	4	11	0	2	84	0	31	26
Queue Length 95th (ft)	20	36	46	12	151	12	88	103
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	481	490	635	191	1929	875	323	2412
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.10	0.38	0.04	0.42	0.03	0.43	0.27
Intersection Summary								

**NEAR-TERM 2008 + ALTERNATIVE H
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

















1: Wilfred Avenue & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.91			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1781	1583	1770	1831		1770	1860	
Flt Permitted		1.00			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1699			1355	1583	1770	1831		1770	1860	
Volume (vph)	0	8	14	123	11	132	11	754	97	148	514	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	8	15	129	12	139	12	794	102	156	541	6
RTOR Reduction (vph)	0	13	0	0	0	113	0	5	0	0	0	0
Lane Group Flow (vph)	0	10	0	0	141	26	12	891	0	156	547	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.2			12.2	12.2	1.0	43.8		8.3	51.1	
Effective Green, g (s)		12.7			12.7	12.7	1.5	44.3		8.8	51.6	
Actuated g/C Ratio		0.16			0.16	0.16	0.02	0.57		0.11	0.66	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		277			221	258	34	1043		200	1234	
v/s Ratio Prot		0.01					0.01	c0.49		c0.09	0.29	
v/s Ratio Perm					c0.10	0.02						
v/c Ratio		0.04			0.64	0.10	0.35	0.85		0.78	0.44	
Uniform Delay, d1		27.4			30.4	27.7	37.7	14.0		33.6	6.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			5.9	0.2	6.2	6.9		17.7	0.3	
Delay (s)		27.5			36.3	27.9	43.9	21.0		51.2	6.5	
Level of Service		C			D	C	D	C		D	A	
Approach Delay (s)		27.5			32.1			21.3			16.4	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay		21.2			HCM Level of Service					C		
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		77.8			Sum of lost time (s)					12.0		
Intersection Capacity Utilization		77.8%			ICU Level of Service					D		
Analysis Period (min)		15										
c Critical Lane Group												













2: Wilfred Avenue & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free											
Grade	0%											
Volume (veh/h)	10	233	10	8	245	8	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	245	11	8	258	8	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None											
Median storage (veh)	None											
Upstream signal (ft)	1210											
pX, platoon unblocked												
vC, conflicting volume	266			256			566	555	251	566	556	262
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			256			566	555	251	566	556	262
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	98	99	97	98	99
cM capacity (veh/h)	1298			1309			416	434	788	416	433	777
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	266	275	32	32								
Volume Left	11	8	11	11								
Volume Right	11	8	11	11								
cSH	1298	1309	502	500								
Volume to Capacity	0.01	0.01	0.06	0.06								
Queue Length 95th (ft)	1	0	5	5								
Control Delay (s)	0.4	0.3	12.7	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.3	12.7	12.7								
Approach LOS				B	B							
Intersection Summary												
Average Delay				1.6								
Intersection Capacity Utilization	27.2%			ICU Level of Service					A			
Analysis Period (min)	15											

















3: Wilfred Avenue & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕											
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	10	232	10	7	241	15	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	244	11	7	254	16	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	269			255			563	555	249	563	552	262
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	269			255			563	555	249	563	552	262
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	98	99	97	98	99
cM capacity (veh/h)	1294			1310			419	434	789	419	436	777
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	277	32	32								
Volume Left	11	7	11	11								
Volume Right	11	16	11	11								
cSH	1294	1310	503	503								
Volume to Capacity	0.01	0.01	0.06	0.06								
Queue Length 95th (ft)	1	0	5	5								
Control Delay (s)	0.4	0.3	12.6	12.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.3	12.6	12.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			27.4%	ICU Level of Service					A			
Analysis Period (min)			15									




















4: Wilfred Avenue & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	   												
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Volume (veh/h)	10	129	113	79	179	8	85	17	114	10	10	10	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	11	136	119	83	188	8	89	18	120	11	11	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None			None			
Median storage veh													
Upstream signal (ft)	1160												
pX, platoon unblocked	0.99						0.99	0.99			0.99	0.99	0.99
vC, conflicting volume	197				255			591	579	195	704	635	193
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	187				255			586	574	195	701	630	183
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				94			77	95	86	96	97	99
cM capacity (veh/h)	1371				1310			381	394	846	274	366	849
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	265	280	227	32									
Volume Left	11	83	89	11									
Volume Right	119	8	120	11									
cSH	1371	1310	539	397									
Volume to Capacity	0.01	0.06	0.42	0.08									
Queue Length 95th (ft)	1	5	52	6									
Control Delay (s)	0.4	2.8	16.5	14.9									
Lane LOS	A	A	C	B									
Approach Delay (s)	0.4	2.8	16.5	14.9									
Approach LOS			C	B									
Intersection Summary													
Average Delay	6.3												
Intersection Capacity Utilization	56.2%			ICU Level of Service			B						
Analysis Period (min)	15												



















5: Wilfred Avenue & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0				4.0				4.0
Lane Util. Factor	1.00			1.00				1.00				1.00
Frt	0.97			1.00				1.00				0.99
Flt Protected	1.00			0.95				0.97				0.96
Satd. Flow (prot)	1803			1770				1814				1779
Flt Permitted	0.97			0.95				0.90				0.87
Satd. Flow (perm)	1754			1770				1680				1602
Volume (vph)	15	183	54	262	246	25	20	17	395	17	3	1
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	193	57	276	259	26	21	18	416	18	3	1
RTOR Reduction (vph)	0	13	0	0	7	0	0	0	246	0	1	0
Lane Group Flow (vph)	0	253	0	276	278	0	0	39	170	0	21	0
Turn Type	Perm			Prot		Perm		Perm		Perm		
Protected Phases	4			3		8		2				6
Permitted Phases	4							2		6		
Actuated Green, G (s)	16.4			17.9		38.8		32.2		32.2		32.2
Effective Green, g (s)	16.9			18.4		39.3		32.7		32.7		32.7
Actuated g/C Ratio	0.21			0.23		0.49		0.41		0.41		0.41
Clearance Time (s)	4.5			4.5		4.5		4.5		4.5		4.5
Vehicle Extension (s)	3.0			3.0		3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	371			407		902		687		647		655
v/s Ratio Prot				c0.16		0.15						
v/s Ratio Perm	c0.14							0.02		c0.11		0.01
v/c Ratio	0.68			0.68		0.31		0.06		0.26		0.03
Uniform Delay, d1	29.1			28.1		12.2		14.3		15.7		14.2
Progression Factor	1.00			1.69		0.68		1.02		1.12		1.04
Incremental Delay, d2	5.1			3.7		0.2		0.2		1.0		0.1
Delay (s)	34.2			51.2		8.5		14.8		18.6		14.8
Level of Service	C			D		A		B		B		B
Approach Delay (s)	34.2					29.5		18.3				14.8
Approach LOS	C					C		B				B
Intersection Summary												
HCM Average Control Delay	26.3			HCM Level of Service					C			
HCM Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	51.5%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												













6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.99			0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	1835		1770	1851			1676			1740	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.86	
Satd. Flow (perm)	1770	1835		1770	1851			1619			1547	
Volume (vph)	11	525	59	82	506	23	21	14	75	14	2	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	553	62	86	533	24	22	15	79	15	2	6
RTOR Reduction (vph)	0	6	0	0	2	0	0	54	0	0	4	0
Lane Group Flow (vph)	12	609	0	86	555	0	0	62	0	0	19	0
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2		6	
Actuated Green, G (s)	1.1	35.5		6.6	41.0			24.4			24.4	
Effective Green, g (s)	1.6	36.0		7.1	41.5			24.9			24.9	
Actuated g/C Ratio	0.02	0.45		0.09	0.52			0.31			0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	35	826		157	960			504			482	
v/s Ratio Prot	0.01	c0.33		c0.05	0.30							
v/s Ratio Perm								c0.04			0.01	
v/c Ratio	0.34	0.74		0.55	0.58			0.12			0.04	
Uniform Delay, d1	38.7	18.1		34.9	13.2			19.7			19.2	
Progression Factor	0.84	1.40		0.99	1.41			1.00			1.00	
Incremental Delay, d2	5.0	3.0		3.2	0.7			0.5			0.2	
Delay (s)	37.7	28.4		37.7	19.4			20.2			19.4	
Level of Service	D	C		D	B			C			B	
Approach Delay (s)		28.6			21.8			20.2			19.4	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay	24.7			HCM Level of Service				C				
HCM Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				12.0				
Intersection Capacity Utilization	52.2%			ICU Level of Service				A				
Analysis Period (min)	15											
c Critical Lane Group												












7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	0.95	1.00	0.97	1.00		
Frt	1.00	0.98		1.00	0.85	1.00	1.00	0.85	1.00	0.93		
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	1830		1770	1863	1583	1770	3539	1583	3433	1741	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1770	1830		1770	1863	1583	1770	3539	1583	3433	1741	
Volume (vph)	46	500	67	180	338	541	172	154	267	425	128	100
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	526	71	189	356	569	181	162	281	447	135	105
RTOR Reduction (vph)	0	6	0	0	0	323	0	0	246	0	35	0
Lane Group Flow (vph)	48	591	0	189	356	246	181	162	35	447	205	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases					8				2			
Actuated Green, G (s)	3.4	28.5		9.0	34.1	34.1	8.5	9.5	9.5	15.0	16.0	
Effective Green, g (s)	3.9	29.0		9.5	34.6	34.6	9.0	10.0	10.0	15.5	16.5	
Actuated g/C Ratio	0.05	0.36		0.12	0.43	0.43	0.11	0.12	0.12	0.19	0.21	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	86	663		210	806	685	199	442	198	665	359	
v/s Ratio Prot	0.03	c0.32		c0.11	0.19		c0.10	0.05		c0.13	0.12	
v/s Ratio Perm					0.16			0.02				
v/c Ratio	0.56	0.89		0.90	0.44	0.36	0.91	0.37	0.18	0.67	0.57	
Uniform Delay, d1	37.2	24.0		34.8	15.9	15.3	35.1	32.1	31.3	29.9	28.6	
Progression Factor	1.23	0.69		1.17	1.24	2.75	1.00	1.00	1.00	1.15	1.17	
Incremental Delay, d2	5.3	12.3		32.5	1.5	1.3	39.0	0.5	0.4	2.7	2.2	
Delay (s)	51.0	28.9		73.1	21.3	43.3	74.1	32.6	31.8	37.0	35.6	
Level of Service	D	C		E	C	D	E	C	C	D	D	
Approach Delay (s)		30.5			41.3			44.3			36.5	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay		38.6			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		76.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												













8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	3274		1770	3539	1583	1770	3529	
Volume (vph)	5	30	138	5	95	95	164	147	5	30	233	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	32	145	5	100	100	173	155	5	32	245	5
RTOR Reduction (vph)	0	0	129	0	89	0	0	0	2	0	1	0
Lane Group Flow (vph)	5	32	16	5	111	0	173	155	3	32	249	0
Turn Type	Prot			Perm	Prot		Prot		Perm	Prot		
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases				4						2		
Actuated Green, G (s)	1.3	8.5	8.5	1.3	8.5		12.8	48.9	48.9	3.3	39.4	
Effective Green, g (s)	1.8	9.0	9.0	1.8	9.0		13.3	49.4	49.4	3.8	39.9	
Actuated g/C Ratio	0.02	0.11	0.11	0.02	0.11		0.17	0.62	0.62	0.05	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	40	210	178	40	368		294	2185	978	84	1760	
v/s Ratio Prot	c0.00	0.02		0.00	c0.03		c0.10	0.04		0.02	c0.07	
v/s Ratio Perm			0.01					0.00				
v/c Ratio	0.12	0.15	0.09	0.12	0.30		0.59	0.07	0.00	0.38	0.14	
Uniform Delay, d1	38.3	32.1	31.8	38.3	32.6		30.8	6.1	5.9	37.0	10.8	
Progression Factor	1.00	1.00	1.00	0.84	1.34		0.98	1.03	1.03	1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.2	1.3	0.4		2.7	0.1	0.0	2.9	0.2	
Delay (s)	39.7	32.4	32.1	33.5	44.3		32.8	6.3	6.0	39.8	11.0	
Level of Service	D	C	C	C	D		C	A	A	D	B	
Approach Delay (s)		32.3			44.0			20.1			14.3	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM Average Control Delay		25.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.26										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		31.4%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												













9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖↗	↕↕					↗	↖↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	
Flt		1.00	0.85	1.00	1.00					1.00	0.91	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539					1610	3071	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539					1610	3071	
Volume (vph)	0	751	440	93	507	0	0	0	0	327	327	552
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	791	463	98	534	0	0	0	0	344	344	581
RTOR Reduction (vph)	0	0	140	0	0	0	0	0	0	0	221	0
Lane Group Flow (vph)	0	791	323	98	534	0	0	0	0	344	704	0
Turn Type		Perm		Prot						Perm		
Protected Phases		4		3	8					6		
Permitted Phases		4								6		
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	998	
v/s Ratio Prot		c0.22		c0.03	0.15							
v/s Ratio Perm		0.20								0.21	0.23	
v/c Ratio		0.48	0.44	0.47	0.26					0.66	0.71	
Uniform Delay, d1		14.8	14.5	36.3	8.5					23.2	23.6	
Progression Factor		1.01	1.25	1.01	0.92					1.00	1.00	
Incremental Delay, d2		0.6	1.2	1.6	0.3					6.4	4.2	
Delay (s)		15.7	19.2	38.1	8.1					29.5	27.8	
Level of Service		B	B	D	A					C	C	
Approach Delay (s)		17.0		12.8		0.0		28.3				
Approach LOS		B		B		A		C				
Intersection Summary												
HCM Average Control Delay		20.7		HCM Level of Service				C				
HCM Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		64.8%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												












10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Flt		1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3392		1681	1739	2787	1770	1814	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3392		1681	1739	2787	1770	1814	
Volume (vph)	0	495	583	409	301	116	214	107	572	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	521	614	431	317	122	225	113	602	44	43	9
RTOR Reduction (vph)	0	0	476	0	41	0	0	0	478	0	7	0
Lane Group Flow (vph)	0	521	138	431	398	0	165	173	124	44	45	0
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			
Actuated Green, G (s)		17.5	17.5	12.5	34.5		16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)		18.0	18.0	13.0	35.0		16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio		0.22	0.22	0.16	0.44		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)		4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1144	356	558	1484		347	359	575	365	374	
v/s Ratio Prot		c0.10		c0.13	0.12		0.10	c0.10		c0.02	0.02	
v/s Ratio Perm			0.09						0.04			
v/c Ratio		0.46	0.39	0.77	0.27		0.48	0.48	0.22	0.12	0.12	
Uniform Delay, d1		26.8	26.3	32.1	14.3		27.9	28.0	26.4	25.8	25.8	
Progression Factor		1.41	4.46	1.19	1.24		0.86	0.86	1.58	0.84	0.82	
Incremental Delay, d2		1.1	2.7	6.1	0.4		4.3	4.2	0.8	0.7	0.7	
Delay (s)		39.0	120.1	44.2	18.2		28.4	28.4	42.5	22.3	21.8	
Level of Service		D	F	D	B		C	C	D	C	C	
Approach Delay (s)		82.8			31.1			37.4			22.1	
Approach LOS		F			C			D			C	
Intersection Summary												
HCM Average Control Delay			52.1		HCM Level of Service				D			
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			61.1%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												






















11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3510		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3510		1770	1583
Volume (vph)	187	922	610	35	93	217
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	971	642	37	98	228
RTOR Reduction (vph)	0	0	4	0	0	168
Lane Group Flow (vph)	197	971	675	0	98	60
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases					6	
Actuated Green, G (s)	9.7	50.5	36.3		20.5	20.5
Effective Green, g (s)	10.2	51.0	36.8		21.0	21.0
Actuated g/C Ratio	0.13	0.64	0.46		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	438	2256	1615		465	416
v/s Ratio Prot	0.06	c0.27	0.19		c0.06	
v/s Ratio Perm						0.04
v/c Ratio	0.45	0.43	0.42		0.21	0.14
Uniform Delay, d1	32.3	7.2	14.4		23.0	22.6
Progression Factor	0.97	1.97	1.00		1.00	1.00
Incremental Delay, d2	0.6	0.5	0.8		1.0	0.7
Delay (s)	31.9	14.8	15.2		24.1	23.3
Level of Service	C	B	B		C	C
Approach Delay (s)		17.7	15.2		23.6	
Approach LOS		B	B		C	
Intersection Summary						
HCM Average Control Delay		17.8		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.37				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		38.5%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1686	1583		1741		1770	3537		1770	3539	1583
Volume (vph)	413	3	260	8	3	5	514	475	2	7	408	619
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	435	3	274	8	3	5	541	500	2	7	429	652
RTOR Reduction (vph)	0	0	219	0	5	0	0	0	0	0	0	503
Lane Group Flow (vph)	218	220	55	0	11	0	541	502	0	7	429	149
Turn Type	Split		Perm		Split		Prot		Prot		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	15.6	15.6	15.6		1.5		27.1	43.4		1.5	17.8	17.8
Effective Green, g (s)	16.1	16.1	16.1		2.0		27.6	43.9		2.0	18.3	18.3
Actuated g/C Ratio	0.20	0.20	0.20		0.02		0.35	0.55		0.02	0.23	0.23
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	338	339	319		44		611	1941		44	810	362
v/s Ratio Prot	0.13	c0.13			c0.01		c0.31	0.14		0.00	c0.12	
v/s Ratio Perm			0.03									0.09
v/c Ratio	0.64	0.65	0.17		0.25		0.89	0.26		0.16	0.53	0.41
Uniform Delay, d1	29.3	29.4	26.4		38.3		24.7	9.5		38.2	27.1	26.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.30	1.08	4.26
Incremental Delay, d2	4.2	4.2	0.3		3.0		14.4	0.3		1.1	1.7	2.3
Delay (s)	33.5	33.6	26.7		41.3		39.1	9.8		50.7	30.9	114.3
Level of Service	C	C	C		D		D	A		D	C	F
Approach Delay (s)		30.9			41.3			25.0			81.0	
Approach LOS		C			D			C			F	
Intersection Summary												
HCM Average Control Delay		47.9		HCM Level of Service					D			
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		80.0		Sum of lost time (s)					16.0			
Intersection Capacity Utilization		80.1%		ICU Level of Service					D			
Analysis Period (min)		15										
c Critical Lane Group												

13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	872	0	0	670
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	918	0	0	705
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						1034
pX, platoon unblocked	0.86					
vC, conflicting volume	1623	918			918	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1727	918			918	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	83	329			743	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	918	705			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.54	0.41			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		49.2%		ICU Level of Service	A	
Analysis Period (min)		15				













14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Volume (veh/h)	211	105	74	220	0	222
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	222	111	78	232	0	234
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	309				748	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	309				748	194
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				100	72
cM capacity (veh/h)	1251				312	848
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	333	309	234			
Volume Left	222	0	0			
Volume Right	0	232	234			
cSH	1251	1700	848			
Volume to Capacity	0.18	0.18	0.28			
Queue Length 95th (ft)	16	0	28			
Control Delay (s)	6.2	0.0	10.9			
Lane LOS	A		B			
Approach Delay (s)	6.2	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization		58.4%		ICU Level of Service	B	
Analysis Period (min)		15				













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	172	89	33	464	489	41	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	181	94	35	488	515	43	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	850	279	558				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	850	279	558				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	37	87	97				
cM capacity (veh/h)	289	718	1009				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	181	94	35	244	244	343	215
Volume Left	181	0	35	0	0	0	0
Volume Right	0	94	0	0	0	0	43
cSH	289	718	1009	1700	1700	1700	1700
Volume to Capacity	0.63	0.13	0.03	0.14	0.14	0.20	0.13
Queue Length 95th (ft)	97	11	3	0	0	0	0
Control Delay (s)	36.2	10.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	B	A				
Approach Delay (s)	27.5		0.6	0.0			
Approach LOS	D						
Intersection Summary							
Average Delay	5.8						
Intersection Capacity Utilization	37.7%		ICU Level of Service		A		
Analysis Period (min)	15						

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	257	286	586	251	212	457
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	301	617	264	223	481
RTOR Reduction (vph)	0	235	0	150	0	0
Lane Group Flow (vph)	271	66	617	114	223	481
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	13.3	13.3	26.7	26.7	9.4	40.6
Effective Green, g (s)	13.8	13.8	27.2	27.2	9.9	41.1
Actuated g/C Ratio	0.22	0.22	0.43	0.43	0.16	0.65
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	347	806	685	279	1217
v/s Ratio Prot	c0.15		c0.33		c0.13	
v/s Ratio Perm	0.04		0.07			
v/c Ratio	0.70	0.19	0.77	0.17	0.80	0.40
Uniform Delay, d1	22.6	20.0	15.1	10.9	25.5	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.3	6.8	0.5	14.7	1.0
Delay (s)	28.0	20.3	22.0	11.4	40.3	6.1
Level of Service	C	C	C	B	D	A
Approach Delay (s)	24.0		18.8		16.9	
Approach LOS	C		B		B	
Intersection Summary						
HCM Average Control Delay	19.6		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.75					
Actuated Cycle Length (s)	62.9		Sum of lost time (s)		12.0	
Intersection Capacity Utilization	66.8%		ICU Level of Service		C	
Analysis Period (min)	15					
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	
Volume (vph)	50	600	36	202	575	365	64	19	154	492	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	384	67	20	162	518	45	104
RTOR Reduction (vph)	0	0	29	0	0	285	0	63	69	0	59	0
Lane Group Flow (vph)	53	632	9	213	605	99	67	34	16	518	90	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	18.0	18.0	5.5	20.2	20.2	4.4	14.1	14.1	24.4	34.1	
Effective Green, g (s)	3.8	18.5	18.5	6.0	20.7	20.7	4.9	14.6	14.6	24.9	34.6	
Actuated g/C Ratio	0.05	0.23	0.23	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	257	916	410	210	285	274	551	721	
v/s Ratio Prot	0.03	c0.18		c0.06	0.17		c0.02	c0.02		c0.29	0.05	
v/s Ratio Perm			0.01			0.06			0.01			
v/c Ratio	0.63	0.77	0.02	0.83	0.66	0.24	0.32	0.12	0.06	0.94	0.12	
Uniform Delay, d1	37.4	28.8	23.8	36.5	26.5	23.4	36.0	27.3	27.0	26.8	13.6	
Progression Factor	1.00	1.00	1.00	0.95	0.51	0.44	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	13.8	1.2	0.2	0.9	0.9	0.4	24.4	0.4	
Delay (s)	51.8	33.3	23.8	48.3	14.8	10.4	36.8	28.2	27.4	51.2	14.0	
Level of Service	D	C	C	D	B	B	D	C	C	D	B	
Approach Delay (s)		34.2			19.4			30.2			42.9	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM Average Control Delay		29.6			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		66.3%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3191	1441	3433	1863	1583
Volume (vph)	233	923	146	371	867	358	137	252	422	364	264	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	972	154	391	913	377	144	265	444	383	278	256
RTOR Reduction (vph)	0	0	103	0	0	250	0	117	227	0	0	206
Lane Group Flow (vph)	245	972	51	391	913	127	144	318	47	383	278	50
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.2	26.0	26.0	11.5	25.3	25.3	9.5	13.1	13.1	11.4	15.0	15.0
Effective Green, g (s)	12.7	26.5	26.5	12.0	25.8	25.8	10.0	13.6	13.6	11.9	15.5	15.5
Actuated g/C Ratio	0.16	0.33	0.33	0.15	0.32	0.32	0.12	0.17	0.17	0.15	0.19	0.19
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	1684	524	515	1141	511	221	542	245	511	361	307
v/s Ratio Prot	c0.14	0.19		0.11	c0.26		0.08	0.10		c0.11	c0.15	
v/s Ratio Perm			0.03			0.08			0.03			0.03
v/c Ratio	0.87	0.58	0.10	0.76	0.80	0.25	0.65	0.59	0.19	0.75	0.77	0.16
Uniform Delay, d1	32.9	22.1	18.5	32.6	24.7	20.0	33.3	30.6	28.5	32.6	30.6	26.8
Progression Factor	0.77	0.67	0.88	0.74	0.67	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.9	0.9	0.2	4.9	4.6	0.9	6.7	1.6	0.4	6.0	9.7	0.2
Delay (s)	41.1	15.7	16.5	28.9	21.1	13.8	40.1	32.2	28.9	38.6	40.3	27.1
Level of Service	D	B	B	C	C	B	D	C	C	D	D	C
Approach Delay (s)		20.4			21.3			32.5			35.9	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay		25.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		72.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

19: Rohnert Park Expy & US-101 SB Ramps

2008 + Alternative H (Mitigated)

Graton Rancheria Casino & Hotel

PM Peak


































												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↰	↑↑	↱		↰		↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.96		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4865		1770	3539	1583		1658		1681	1686	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.91		0.74	0.71	1.00
Satd. Flow (perm)		4865		1770	3539	1583		1529		1311	1254	1583
Volume (vph)	0	1215	493	68	1235	199	7	0	17	702	1	351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1279	519	72	1300	209	7	0	18	739	1	369
RTOR Reduction (vph)	0	86	0	0	0	0	0	12	0	0	0	28
Lane Group Flow (vph)	0	1712	0	72	1300	209	0	13	0	370	370	341
Turn Type	Prot			Free			Perm			Perm		
Protected Phases	4			3			2			6		
Permitted Phases				Free			2			6		
Actuated Green, G (s)	35.4			4.8			44.7			80.0		
Effective Green, g (s)	35.9			5.3			45.2			80.0		
Actuated g/C Ratio	0.45			0.07			0.57			1.00		
Clearance Time (s)	4.5			4.5			4.5			4.5		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	2183			117			2000			1583		
v/s Ratio Prot	c0.35			0.04			c0.37					
v/s Ratio Perm							0.13			0.01		
v/c Ratio	0.78			0.62			0.65			0.13		
Uniform Delay, d1	18.8			36.4			12.0			0.0		
Progression Factor	0.36			0.83			1.45			1.00		
Incremental Delay, d2	2.3			8.3			1.5			0.2		
Delay (s)	9.0			38.5			18.8			0.2		
Level of Service	A			D			B			A		
Approach Delay (s)	9.0			17.2			17.9			35.9		
Approach LOS	A			B			B			D		
Intersection Summary												
HCM Average Control Delay	18.5			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	74.4%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps

2008 + Alternative H (Mitigated)























Graton Rancheria Casino & Hotel

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 		 	 	  
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.81	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1467	
Volume (vph)	17	1638	273	0	993	350	505	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1724	287	0	1045	368	532	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	2	0
Lane Group Flow (vph)	18	1724	287	0	1045	368	532	160	160	0	16	0
Turn Type	Prot		Free		Free		Perm		Perm		Perm	
Protected Phases	7		4		8		2		6		6	
Permitted Phases			Free		Free		2		2		6	
Actuated Green, G (s)	2.2		50.5		80.0		20.5		20.5		20.5	
Effective Green, g (s)	2.7		51.0		80.0		21.0		21.0		21.0	
Actuated g/C Ratio	0.03		0.64		1.00		0.26		0.26		0.26	
Clearance Time (s)	4.5		4.5		4.5		4.5		4.5		4.5	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	60		4085		1583		707		395		385	
v/s Ratio Prot	0.01		c0.27		0.21		0.11					
v/s Ratio Perm			0.18		0.23		c0.20		0.11		0.01	
v/c Ratio	0.30		0.42		0.18		0.23		0.40		0.04	
Uniform Delay, d1	37.7		7.2		0.0		10.0		27.1		24.3	
Progression Factor	1.04		0.98		1.00		1.00		1.00		1.00	
Incremental Delay, d2	1.6		0.2		0.1		0.4		0.3		0.7	
Delay (s)	40.9		7.3		0.1		10.4		0.3		25.0	
Level of Service	D		A		A		B		A		C	
Approach Delay (s)	6.6		7.8		29.1		22.0		C		C	
Approach LOS	A		A		A		C		C		C	
Intersection Summary												
HCM Average Control Delay	11.5			HCM Level of Service					B			
HCM Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					8.0			
Intersection Capacity Utilization	49.7%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												
























21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583	
Volume (vph)	270	1145	545	141	779	170	380	286	224	102	230	183	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	284	1205	574	148	820	179	400	301	236	107	242	193	
RTOR Reduction (vph)	0	0	72	0	37	0	0	0	192	0	0	165	
Lane Group Flow (vph)	284	1205	502	148	962	0	226	475	44	107	242	28	
Turn Type	Prot	pm+ov			Prot	Split			Perm	Split			Perm
Protected Phases	7	4	2	3	8	2			2	6			6
Permitted Phases				4				2			6		
Actuated Green, G (s)	11.6	32.6	48.2	7.5	28.5	15.6			15.6	15.6	11.7	11.7	11.7
Effective Green, g (s)	12.1	33.1	49.2	8.0	29.0	16.1			16.1	16.1	12.2	12.2	12.2
Actuated g/C Ratio	0.14	0.39	0.58	0.09	0.34	0.19			0.19	0.19	0.14	0.14	0.14
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	486	1372	986	166	1681	304			628	298	230	484	226
v/s Ratio Prot	0.08	c0.34	0.10	c0.08	0.19	0.14			c0.14	0.07			c0.07
v/s Ratio Perm				0.22				0.03			0.02		
v/c Ratio	0.58	0.88	0.51	0.89	0.57	0.74			0.76	0.15	0.47	0.50	0.12
Uniform Delay, d1	34.3	24.3	10.9	38.3	23.1	32.7			32.8	28.9	33.6	33.8	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	8.2	0.4	40.3	1.4	9.5			5.2	0.2	1.5	0.8	0.2
Delay (s)	36.1	32.5	11.3	78.5	24.5	42.2			38.0	29.2	35.1	34.6	32.2
Level of Service	D	C	B	E	C	D			D	C	D	C	C
Approach Delay (s)	27.1			31.5			36.8			33.8			
Approach LOS	C			C			D			C			
Intersection Summary													
HCM Average Control Delay	30.9			HCM Level of Service					C				
HCM Volume to Capacity ratio	0.79												
Actuated Cycle Length (s)	85.4			Sum of lost time (s)					16.0				
Intersection Capacity Utilization	71.8%			ICU Level of Service					C				
Analysis Period (min)	15												
c Critical Lane Group													













22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	133	484	202	128	589	143	321	494	108	132	342	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	140	509	213	135	620	151	338	520	114	139	360	231
RTOR Reduction (vph)	0	67	0	0	0	115	0	0	75	0	0	174
Lane Group Flow (vph)	140	655	0	135	620	36	338	520	39	139	360	57
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.5	15.8		5.5	15.8	15.8	13.5	23.5	23.5	6.5	16.5	16.5
Effective Green, g (s)	6.0	16.3		6.0	16.3	16.3	14.0	24.0	24.0	7.0	17.0	17.0
Actuated g/C Ratio	0.09	0.24		0.09	0.24	0.24	0.20	0.35	0.35	0.10	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	796		153	832	372	358	645	548	179	457	388
v/s Ratio Prot	c0.08	c0.19		0.08	0.18		c0.19	c0.28		0.08	0.19	
v/s Ratio Perm						0.02			0.02			0.04
v/c Ratio	0.92	0.82		0.88	0.75	0.10	0.94	0.81	0.07	0.78	0.79	0.15
Uniform Delay, d1	31.4	25.1		31.3	24.6	20.7	27.3	20.5	15.2	30.4	24.5	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	6.9		40.4	3.7	0.1	33.1	10.4	0.3	18.8	12.9	0.8
Delay (s)	79.5	32.0		71.7	28.2	20.8	60.4	30.9	15.4	49.2	37.3	21.3
Level of Service	E	C		E	C	C	E	C	B	D	D	C
Approach Delay (s)		39.7			33.5			39.4			34.5	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM Average Control Delay			36.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			69.3			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			76.0%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00			1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3514		1770	3539	1583	1770	1660		1770	1649	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3514		1770	3539	1583	1770	1660		1770	1649	
Volume (vph)	102	661	32	53	778	333	48	24	63	485	29	96
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	696	34	56	819	351	51	25	66	511	31	101
RTOR Reduction (vph)	0	3	0	0	0	132	0	61	0	0	60	0
Lane Group Flow (vph)	107	727	0	56	819	219	51	30	0	511	72	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.6	28.3		4.4	25.1	25.1	3.3	6.3		33.0	36.0	
Effective Green, g (s)	8.1	28.8		4.9	25.6	25.6	3.8	6.8		33.5	36.5	
Actuated g/C Ratio	0.09	0.32		0.05	0.28	0.28	0.04	0.08		0.37	0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	1124		96	1007	450	75	125		659	669	
v/s Ratio Prot	0.06	c0.21		0.03	c0.23		c0.03	0.02		c0.29	c0.04	
v/s Ratio Perm						0.14						
v/c Ratio	0.67	0.65		0.58	0.81	0.49	0.68	0.24		0.78	0.11	
Uniform Delay, d1	39.7	26.2		41.6	30.0	26.7	42.5	39.2		24.9	16.6	
Progression Factor	1.00	1.00		0.67	0.58	0.21	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	2.9		8.0	6.6	3.4	22.4	1.0		5.7	0.1	
Delay (s)	50.4	29.1		35.7	24.0	9.0	64.9	40.2		30.6	16.7	
Level of Service	D	C		D	C	A	E	D		C	B	
Approach Delay (s)		31.8			20.2			49.1			27.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		26.8										
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		90.0						20.0				
Intersection Capacity Utilization		72.5%										
Analysis Period (min)		15										
c Critical Lane Group												











24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0						4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	819	397	99	940	0	0	0	0	639	0	212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	862	418	104	989	0	0	0	0	673	0	223
RTOR Reduction (vph)	0	0	105	0	0	0	0	0	0	0	81	0
Lane Group Flow (vph)	0	862	313	104	989	0	0	0	0	673	142	0
Turn Type			Perm	Prot						Prot		
Protected Phases		4		3	8					1	6	
Permitted Phases			4									
Actuated Green, G (s)		36.4	36.4	11.6	52.5					28.5	28.5	
Effective Green, g (s)		36.9	36.9	12.1	53.0					29.0	29.0	
Actuated g/C Ratio		0.41	0.41	0.13	0.59					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1451	649	238	2084					1106	510	
v/s Ratio Prot		c0.24		0.06	c0.28					c0.20	0.09	
v/s Ratio Perm			0.20									
v/c Ratio		0.59	0.48	0.44	0.47					0.61	0.28	
Uniform Delay, d1		20.7	19.5	35.8	10.6					25.7	22.7	
Progression Factor		0.54	0.49	1.27	1.69					1.00	1.00	
Incremental Delay, d2		1.3	1.9	1.2	0.7					1.0	1.4	
Delay (s)		12.6	11.4	46.6	18.6					26.7	24.1	
Level of Service		B	B	D	B					C	C	
Approach Delay (s)		12.2			21.3				0.0		26.0	
Approach LOS		B			C				A		C	
Intersection Summary												
HCM Average Control Delay			19.0									
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			90.0							8.0		
Intersection Capacity Utilization			61.7%									
Analysis Period (min)			15									
c Critical Lane Group												

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1461	0	0	617	391	236
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1538	0	0	649	412	248
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	1538	0	0	649	412	227
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	63.0			63.0	18.0	18.0
Effective Green, g (s)	63.5			63.5	18.5	18.5
Actuated g/C Ratio	0.71			0.71	0.21	0.21
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2497			2497	706	325
v/s Ratio Prot	c0.43			0.18	0.12	
v/s Ratio Perm				c0.14		
v/c Ratio	0.62			0.26	0.58	0.70
Uniform Delay, d1	6.9			4.8	32.3	33.2
Progression Factor	0.32			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.3	1.2	6.4
Delay (s)	3.2			5.0	33.5	39.6
Level of Service	A			A	C	D
Approach Delay (s)	3.2			5.0	35.8	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			11.2	HCM Level of Service		B
HCM Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			61.7%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

















26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1719			1850	1583	1770	3539	1583	1770	3536	
Flt Permitted		0.90			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1580			1789	1583	1770	3539	1583	1770	3536	
Volume (vph)	8	5	10	1	6	211	19	770	17	113	631	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	5	11	1	6	222	20	811	18	119	664	4
RTOR Reduction (vph)	0	9	0	0	0	191	0	0	9	0	0	0
Lane Group Flow (vph)	0	15	0	0	7	31	20	811	9	119	668	0
Turn Type	Perm			Perm			Perm			Prot		
Protected Phases	4			8			5			2		
Permitted Phases	4			8			8			2		
Actuated Green, G (s)	6.3			6.3			0.9			24.6		
Effective Green, g (s)	6.8			6.8			1.4			25.1		
Actuated g/C Ratio	0.14			0.14			0.03			0.51		
Clearance Time (s)	4.5			4.5			4.5			4.5		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	219			248			50			1809		
v/s Ratio Prot							0.01			c0.23		
v/s Ratio Perm	0.01			0.00			c0.02			0.01		
v/c Ratio	0.07			0.03			0.14			0.40		
Uniform Delay, d1	18.4			18.3			18.6			7.6		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.1			0.0			0.3			5.2		
Delay (s)	18.5			18.3			18.9			7.8		
Level of Service	B			B			C			A		
Approach Delay (s)	18.5			18.9			8.2			8.7		
Approach LOS	B			B			A			A		
Intersection Summary												
HCM Average Control Delay	9.8			HCM Level of Service						A		
HCM Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	49.1			Sum of lost time (s)						16.0		
Intersection Capacity Utilization	47.7%			ICU Level of Service						A		
Analysis Period (min)	15											
c Critical Lane Group												

















27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Volume (veh/h)	1	134	3	3	216	2	1	0	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	141	3	3	227	2	1	0	1	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None		None		
Median storage (veh)												
Upstream signal (ft)	1180											
pX, platoon unblocked												
vC, conflicting volume	229			144			380	381	143	381	381	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229			144			380	381	143	381	381	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1339			1438			576	550	905	575	550	811
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	145	233	2	1								
Volume Left	1	3	1	0								
Volume Right	3	2	1	0								
cSH	1339	1438	704	550								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.1	10.1	11.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.1	11.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization	23.5%		ICU Level of Service				A					
Analysis Period (min)	15											

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	   											
Sign Control	Free				Free				Stop		Stop	
Grade	0%											
Volume (veh/h)	1	119	2	4	225	8	1	9	0	4	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	125	2	4	237	8	1	9	0	4	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	245			127			379	382	126	383	379	241
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			127			379	382	126	383	379	241
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1321			1459			576	549	924	566	551	798
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	128	249	11	5								
Volume Left	1	4	1	4								
Volume Right	2	8	0	1								
cSH	1321	1459	551	601								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	1	1								
Control Delay (s)	0.1	0.2	11.7	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	11.7	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization	24.9%		ICU Level of Service		A							
Analysis Period (min)			15									

















29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	↗	↖	←	↙	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↙	↘
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	150	5	2	280	10	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	5	2	295	11	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			163		459	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		459	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1415		559	885
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	163	297	17			
Volume Left	0	2	11			
Volume Right	5	0	6			
cSH	1700	1415	648			
Volume to Capacity	0.10	0.00	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.1	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		26.3%		ICU Level of Service	A	
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	155	4	10	252	0	31	0	11	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	163	4	11	265	0	33	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	265			167			452	452	165	463	454	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			167			452	452	165	463	454	265
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			94	100	99	100	100	100
cM capacity (veh/h)	1299			1410			515	500	879	499	498	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	167	276	44	0								
Volume Left	0	11	33	0								
Volume Right	4	0	12	0								
cSH	1299	1410	578	1700								
Volume to Capacity	0.00	0.01	0.08	0.00								
Queue Length 95th (ft)	0	1	6	0								
Control Delay (s)	0.0	0.4	11.7	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.4	11.7	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization		31.4%		ICU Level of Service	A							
Analysis Period (min)		15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	143	20	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	151	21	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1405		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	247	34			
Volume Left	0	0	34			
Volume Right	21	0	0			
cSH	1700	1405	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service	A	
Analysis Period (min)		15				

1: Wilfred Avenue & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	141	139	12	896	156	547
v/c Ratio	0.08	0.61	0.36	0.09	0.89	0.74	0.42
Control Delay	16.3	40.0	8.7	38.2	29.0	55.7	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	40.0	8.7	38.2	29.0	55.7	7.5
Queue Length 50th (ft)	3	62	2	5	343	73	84
Queue Length 95th (ft)	22	119	45	22	#655	#175	239
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	381	294	450	130	1023	215	1292
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.48	0.31	0.09	0.88	0.73	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Avenue & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak







	→	↖	←	↑	↗	↓
Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	266	276	285	39	416	22
v/c Ratio	0.69	0.68	0.31	0.06	0.47	0.03
Control Delay	36.4	53.5	7.8	19.9	5.0	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	53.5	7.8	19.9	5.0	20.0
Queue Length 50th (ft)	116	141	62	12	1	6
Queue Length 95th (ft)	175	228	55	m38	m68	m27
Internal Link Dist (ft)	1080		1070	1920		2200
Turn Bay Length (ft)						
Base Capacity (vph)	450	642	1199	675	893	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.43	0.24	0.06	0.47	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.











6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	12	615	86	557	116	23
v/c Ratio	0.09	0.80	0.47	0.58	0.19	0.04
Control Delay	30.5	34.9	40.5	20.1	10.4	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	34.9	40.5	20.1	10.4	18.6
Queue Length 50th (ft)	6	255	41	74	13	6
Queue Length 95th (ft)	m10	393	m70	m384	55	25
Internal Link Dist (ft)		1070		550	377	2220
Turn Bay Length (ft)						
Base Capacity (vph)	133	969	199	1081	624	542
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.63	0.43	0.52	0.19	0.04
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	597	189	356	569	181	162	281	447	240
v/c Ratio	0.29	0.89	0.90	0.41	0.55	0.91	0.36	0.63	0.67	0.61
Control Delay	44.0	30.8	79.7	21.5	7.2	82.2	33.6	11.1	42.1	34.9
Queue Delay	0.0	6.1	0.0	2.3	0.7	0.0	0.0	0.1	0.0	0.0
Total Delay	44.0	36.9	79.7	23.7	7.9	82.2	33.6	11.1	42.1	34.9
Queue Length 50th (ft)	19	280	92	90	66	91	40	0	114	99
Queue Length 95th (ft)	m28	m#457	m#184	m203	109	#208	63	62	#218	173
Internal Link Dist (ft)		550		220			110			270
Turn Bay Length (ft)						150		100		275
Base Capacity (vph)	365	669	210	869	1042	199	730	550	663	394
Starvation Cap Reductn	0	0	0	373	197	0	0	0	0	0
Spillback Cap Reductn	0	46	0	0	0	0	0	12	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.96	0.90	0.72	0.67	0.91	0.22	0.52	0.67	0.61
Intersection Summary										
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.										
m Volume for 95th percentile queue is metered by upstream signal.										

8: Commerce Boulevard & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	32	145	5	200	173	155	5	32	250
v/c Ratio	0.04	0.15	0.47	0.04	0.44	0.59	0.06	0.00	0.20	0.13
Control Delay	34.4	32.8	11.6	28.8	25.3	36.8	6.9	6.8	35.8	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	32.8	11.6	28.8	25.3	36.8	6.9	6.8	35.8	11.3
Queue Length 50th (ft)	2	15	0	2	19	84	6	0	15	27
Queue Length 95th (ft)	13	39	49	m7	71	121	37	m1	40	71
Internal Link Dist (ft)		180			140		120			130
Turn Bay Length (ft)	75		75	100		150		150	200	
Base Capacity (vph)	155	442	487	155	854	398	2464	1104	184	1920
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.30	0.03	0.23	0.43	0.06	0.00	0.17	0.13
Intersection Summary										
m Volume for 95th percentile queue is metered by upstream signal.										

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	↘	↙	←	↖	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	791	463	98	534	344	925
v/c Ratio	0.47	0.52	0.38	0.26	0.66	0.76
Control Delay	15.8	9.8	39.9	8.2	30.3	20.0
Queue Delay	1.0	1.3	0.0	0.0	0.0	0.2
Total Delay	16.8	11.1	39.9	8.2	30.3	20.3
Queue Length 50th (ft)	142	50	21	38	160	146
Queue Length 95th (ft)	m233	m194	45	67	261	223
Internal Link Dist (ft)		220		466		348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	889	257	2035	523	1219
Starvation Cap Reductn	591	233	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	38
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.71	0.38	0.26	0.66	0.78
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	↘	↙	←	↖	↑	↗	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	521	614	431	439	165	173	602	44	52
v/c Ratio	0.46	0.74	0.77	0.29	0.48	0.48	0.57	0.12	0.14
Control Delay	39.3	17.9	48.2	15.3	29.0	29.0	6.4	22.7	19.4
Queue Delay	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	20.0	48.2	15.3	29.0	29.0	6.4	22.7	19.4
Queue Length 50th (ft)	98	115	119	91	52	54	0	22	23
Queue Length 95th (ft)	124	207	#178	125	m111	m116	80	52	54
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	832	558	1525	347	359	1053	365	381
Starvation Cap Reductn	0	107	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.85	0.77	0.29	0.48	0.48	0.57	0.12	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel










2008 + Alternative H (Mitigated)
PM Peak

	↘	→	←	↙	↘
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	197	971	679	98	228
v/c Ratio	0.45	0.43	0.42	0.21	0.39
Control Delay	33.7	15.0	15.7	24.5	5.8
Queue Delay	0.0	0.5	0.0	0.0	0.0
Total Delay	33.7	15.5	15.7	24.5	5.8
Queue Length 50th (ft)	54	181	113	38	0
Queue Length 95th (ft)	85	207	166	77	51
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1618	465	584
Starvation Cap Reductn	0	740	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.64	0.42	0.21	0.39

Intersection Summary







12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	218	220	274	16	541	502	7	429	652
v/c Ratio	0.64	0.65	0.51	0.11	1.02	0.22	0.05	0.38	0.69
Control Delay	37.6	37.7	6.9	29.3	74.3	9.3	43.7	27.3	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	37.6	37.7	6.9	29.3	74.3	9.3	43.7	27.3	13.3
Queue Length 50th (ft)	105	106	0	5	~278	39	4	98	143
Queue Length 95th (ft)	167	168	55	23	#478	142	m5 m#186	#283	
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	618	179	531	2258	177	1127	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	70
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.50	0.44	0.09	1.02	0.22	0.04	0.38	0.74
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	301	617	264	223	481
v/c Ratio	0.70	0.52	0.77	0.32	0.80	0.40
Control Delay	32.9	6.5	24.2	3.0	50.2	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	6.5	24.2	3.0	50.2	6.7
Queue Length 50th (ft)	96	0	201	0	86	78
Queue Length 95th (ft)	168	54	#375	38	#194	132
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	617	805	834	281	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.49	0.77	0.32	0.79	0.40
Intersection Summary						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	632	38	213	605	384	67	97	85	518	149
v/c Ratio	0.40	0.86	0.11	0.83	0.66	0.55	0.26	0.24	0.22	0.98	0.18
Control Delay	44.6	43.6	9.9	55.1	17.7	3.7	37.7	11.2	8.0	63.6	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	43.6	9.9	55.1	17.7	3.7	37.7	11.2	8.0	63.6	5.7
Queue Length 50th (ft)	26	160	0	42	84	0	16	8	0	254	13
Queue Length 95th (ft)	61	#245	23	m#80	m#156	m4	36	48	36	#451	45
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	366	257	915	694	257	398	393	531	833
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.84	0.10	0.83	0.66	0.55	0.26	0.24	0.22	0.98	0.18
Intersection Summary											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	245	972	154	391	913	377	144	435	274	383	278	256
v/c Ratio	0.88	0.58	0.25	0.76	0.80	0.50	0.65	0.66	0.58	0.75	0.77	0.50
Control Delay	47.5	16.0	3.9	32.9	22.0	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	16.0	3.9	32.9	22.0	3.6	50.0	25.3	9.2	45.8	45.6	7.6
Queue Length 50th (ft)	83	95	9	104	242	27	71	74	0	95	129	0
Queue Length 95th (ft)	m116	m108	m13	#156	#264	37	#157	118	65	#188	#230	58
Internal Link Dist (ft)		320			520			554			480	
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1685	627	515	1143	761	221	789	522	511	396	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.58	0.25	0.76	0.80	0.50	0.65	0.55	0.52	0.75	0.70	0.48
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1798	72	1300	209	25	370	370	369
v/c Ratio	0.77	0.51	0.65	0.13	0.05	0.84	0.88	0.66
Control Delay	8.8	42.0	20.0	0.2	9.8	43.2	48.5	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	42.0	20.0	0.2	9.8	43.2	48.5	25.9
Queue Length 50th (ft)	125	36	305	0	2	169	172	131
Queue Length 95th (ft)	161	m55	432	m0	18	#318	#329	222
Internal Link Dist (ft)	520	960			428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2324	142	2000	1583	568	475	455	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.51	0.65	0.13	0.04	0.78	0.81	0.61
Intersection Summary								
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							
m	Volume for 95th percentile queue is metered by upstream signal.							

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↘	→	↘	←	↙	↘	↑	↘	↓
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	1724	287	1045	368	532	161	161	18
v/c Ratio	0.14	0.42	0.18	0.35	0.23	0.75	0.41	0.41	0.04
Control Delay	37.6	8.0	0.1	10.8	0.3	33.5	25.8	25.8	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	8.0	0.1	10.8	0.3	33.5	25.8	25.8	16.9
Queue Length 50th (ft)	10	154	0	77	0	125	68	68	6
Queue Length 95th (ft)	m12	m193	m0	171	0	157	109	109	19
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	133	4082	1583	2985	1583	1415	791	791	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	116	0	0	0	0	31	31	32
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.43	0.18	0.35	0.23	0.38	0.21	0.21	0.02
Intersection Summary									
m	Volume for 95th percentile queue is metered by upstream signal.								

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	284	1205	574	148	999	226	475	236	107	242	193
v/c Ratio	0.59	0.88	0.55	0.89	0.58	0.74	0.76	0.48	0.47	0.50	0.49
Control Delay	40.6	34.1	8.8	88.1	23.9	49.9	42.1	8.2	40.4	37.4	9.8
Queue Delay	0.0	4.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	38.9	9.9	88.1	23.9	49.9	42.1	8.2	40.4	37.4	9.8
Queue Length 50th (ft)	74	309	103	80	150	126	132	0	59	67	0
Queue Length 95th (ft)	121	#478	214	#202	209	#258	#214	61	113	104	56
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	483	1369	1038	166	1719	310	641	495	296	624	449
Starvation Cap Reductn	0	116	237	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.96	0.72	0.89	0.58	0.73	0.74	0.48	0.36	0.39	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	722	135	620	151	338	520	114	139	360	231
v/c Ratio	0.92	0.84	0.88	0.74	0.31	0.95	0.81	0.18	0.78	0.79	0.41
Control Delay	89.3	32.4	82.8	30.8	6.2	66.8	32.8	4.5	61.8	39.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	32.4	82.8	30.8	6.2	66.8	32.8	4.5	61.8	39.5	6.0
Queue Length 50th (ft)	61	136	59	128	0	145	201	0	60	146	0
Queue Length 95th (ft)	#162	#221	#155	184	41	#296	#358	30	#148	#275	49
Internal Link Dist (ft)		689		6630			734			980	
Turn Bay Length (ft)	350		500		150	550		675	500		625
Base Capacity (vph)	153	887	153	859	499	357	645	623	179	456	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.88	0.72	0.30	0.95	0.81	0.18	0.78	0.79	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	↖	→	↙	←	↖	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	730	56	819	351	51	91	511	132
v/c Ratio	0.67	0.59	0.47	0.76	0.58	0.43	0.44	0.80	0.18
Control Delay	64.2	29.6	39.4	23.6	6.5	52.2	21.8	35.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	29.6	39.4	23.6	6.5	52.2	21.8	35.9	5.8
Queue Length 50th (ft)	61	200	33	244	4	28	14	237	10
Queue Length 95th (ft)	#161	#276	m65	#347	19	65	57	#388	43
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	159	1232	118	1077	610	118	367	653	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.59	0.47	0.76	0.58	0.43	0.25	0.78	0.17
Intersection Summary									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	↘	↙	←	↘	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	862	418	104	989	673	223
v/c Ratio	0.58	0.54	0.39	0.47	0.61	0.38
Control Delay	13.0	8.1	47.3	18.9	28.6	13.1
Queue Delay	0.2	0.3	0.0	0.3	0.0	0.0
Total Delay	13.2	8.4	47.3	19.2	28.6	13.1
Queue Length 50th (ft)	125	64	58	233	164	43
Queue Length 95th (ft)	155	m99	m106	291	222	101
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1486	768	295	2084	1106	591
Starvation Cap Reductn	139	65	0	492	0	0
Spillback Cap Reductn	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.59	0.35	0.62	0.61	0.38
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2008 + Alternative H (Mitigated)
PM Peak

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1538	649	412	248
v/c Ratio	0.62	0.26	0.59	0.72
Control Delay	3.5	5.8	34.9	40.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.6	5.8	34.9	40.8
Queue Length 50th (ft)	0	58	110	119
Queue Length 95th (ft)	243	112	137	178
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2498	2498	1221	580
Starvation Cap Reductn	65	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.26	0.34	0.43
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel













2008 + Alternative H (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	7	222	20	811	18	119	668
v/c Ratio	0.08	0.02	0.49	0.10	0.43	0.02	0.41	0.29
Control Delay	13.8	17.0	7.5	23.7	10.3	5.3	22.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	17.0	7.5	23.7	10.3	5.3	22.1	5.5
Queue Length 50th (ft)	3	1	0	4	80	0	25	25
Queue Length 95th (ft)	18	10	44	22	151	10	76	107
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	527	574	650	206	2047	923	325	2426
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.34	0.10	0.40	0.02	0.37	0.28
Intersection Summary								

**CUMULATIVE 2020 + ALTERNATIVE H
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

















1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.92			1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1717			1787	1583	1770	1807		1770	1860	
Flt Permitted		1.00			0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1717			1371	1583	1770	1807		1770	1860	
Volume (vph)	0	12	17	129	23	130	14	740	184	177	522	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	13	18	136	24	137	15	779	194	186	549	6
RTOR Reduction (vph)	0	15	0	0	0	85	0	9	0	0	0	0
Lane Group Flow (vph)	0	16	0	0	160	52	15	964	0	186	555	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		13.4			13.4	13.4	1.0	51.0		9.6	59.6	
Effective Green, g (s)		13.9			13.9	13.9	1.5	51.5		10.1	60.1	
Actuated g/C Ratio		0.16			0.16	0.16	0.02	0.59		0.12	0.69	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		273			218	251	30	1064		204	1278	
v/s Ratio Prot		0.01					0.01	c0.53		c0.11	0.30	
v/s Ratio Perm					c0.12	0.03						
v/c Ratio		0.06			0.73	0.21	0.50	0.91		0.91	0.43	
Uniform Delay, d1		31.2			35.0	32.0	42.6	15.9		38.3	6.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			12.0	0.4	12.5	10.9		39.2	0.2	
Delay (s)		31.3			47.1	32.4	55.1	26.7		77.5	6.3	
Level of Service		C			D	C	E	C		E	A	
Approach Delay (s)		31.3			40.3			27.1			24.2	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM Average Control Delay		28.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		87.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		85.0%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

2: Wilfred Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	   												
Sign Control	Free			Free			Stop		Turn Bay Length				
Grade	0%			0%			0%		0%				
Volume (veh/h)	25	328	20	8	263	10	10	10	10	9	9	10	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	26	345	21	8	277	11	11	11	11	9	9	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None								None				
Median storage (veh)													
Upstream signal (ft)	1210												
pX, platoon unblocked													
vC, conflicting volume	287				366			723	713	356	723	718	282
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	287				366			723	713	356	723	718	282
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98				99			97	97	98	97	97	99
cM capacity (veh/h)	1275				1192			323	348	688	322	345	757
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	393	296	32	29									
Volume Left	26	8	11	9									
Volume Right	21	11	11	11									
cSH	1275	1192	404	416									
Volume to Capacity	0.02	0.01	0.08	0.07									
Queue Length 95th (ft)	2	1	6	6									
Control Delay (s)	0.7	0.3	14.7	14.3									
Lane LOS	A	A	B	B									
Approach Delay (s)	0.7	0.3	14.7	14.3									
Approach LOS				B	B								
Intersection Summary													
Average Delay				1.7									
Intersection Capacity Utilization	40.0%			ICU Level of Service					A				
Analysis Period (min)	15												

3: Wilfred Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	325	11	11	263	25	10	10	10	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	342	12	12	277	26	11	11	11	11	11	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	303			354			700	697	348	700	690	290
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			354			700	697	348	700	690	290
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	97	98	97	97	99
cM capacity (veh/h)	1258			1205			336	358	695	336	361	749
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	365	315	32	32								
Volume Left	12	12	11	11								
Volume Right	12	26	11	11								
cSH	1258	1205	416	424								
Volume to Capacity	0.01	0.01	0.08	0.07								
Queue Length 95th (ft)	1	1	6	6								
Control Delay (s)	0.3	0.4	14.4	14.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.4	14.4	14.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			32.1%		ICU Level of Service				A			
Analysis Period (min)			15									









4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕	↕		↕			↕	
Sign Control		Free		Free	Free	Free		Stop			Stop	
Grade		0%		0%	0%	0%		0%			0%	
Volume (veh/h)	44	187	114	80	199	32	83	15	112	23	10	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	197	120	84	209	34	87	16	118	24	11	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)					1160							
pX, platoon unblocked												
vC, conflicting volume	243			317			751	761	257	853	787	209
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			317			751	761	257	853	787	209
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			93			70	95	85	88	96	98
cM capacity (veh/h)	1323			1243			288	301	782	210	291	831
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	363	84	209	34	221	53						
Volume Left	46	84	0	0	87	24						
Volume Right	120	0	0	34	118	18						
cSH	1323	1243	1700	1700	436	304						
Volume to Capacity	0.04	0.07	0.12	0.02	0.51	0.17						
Queue Length 95th (ft)	3	5	0	0	70	15						
Control Delay (s)	1.3	8.1	0.0	0.0	21.4	19.3						
Lane LOS	A	A			C	C						
Approach Delay (s)	1.3	2.1			21.4	19.3						
Approach LOS					C	C						
Intersection Summary												
Average Delay			7.2									
Intersection Capacity Utilization			54.5%		ICU Level of Service				A			
Analysis Period (min)			15									









5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.97			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.96	
Satd. Flow (prot)	1770	3434		1770	3420			1802	1583		1779	
Flt Permitted	0.95	1.00		0.95	1.00			0.81	1.00		0.77	
Satd. Flow (perm)	1770	3434		1770	3420			1514	1583		1429	
Volume (vph)	20	242	60	324	258	75	49	24	558	65	11	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	255	63	341	272	79	52	25	587	68	12	4
RTOR Reduction (vph)	0	29	0	0	41	0	0	0	346	0	2	0
Lane Group Flow (vph)	21	289	0	341	310	0	0	77	241	0	82	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2			2	6		
Actuated Green, G (s)	2.5	14.3		19.9	31.7			32.3	32.3		32.3	
Effective Green, g (s)	3.0	14.8		20.4	32.2			32.8	32.8		32.8	
Actuated g/C Ratio	0.04	0.19		0.25	0.40			0.41	0.41		0.41	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	66	635		451	1377			621	649		586	
v/s Ratio Prot	0.01	c0.08		c0.19	0.09							
v/s Ratio Perm								0.05	c0.15		0.06	
v/c Ratio	0.32	0.46		0.76	0.22			0.12	0.37		0.14	
Uniform Delay, d1	37.5	29.0		27.5	15.7			14.7	16.4		14.8	
Progression Factor	1.00	1.00		1.22	1.59			1.01	1.12		1.03	
Incremental Delay, d2	2.8	0.5		6.5	0.1			0.4	1.6		0.5	
Delay (s)	40.3	29.5		40.0	25.1			15.2	20.0		15.6	
Level of Service	D	C		D	C			B	C		B	
Approach Delay (s)		30.2			32.4			19.5			15.6	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay		26.4			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		57.6%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.98			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	3424		1770	3454			1676			1731	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.50	
Satd. Flow (perm)	1770	3424		1770	3454			1545			889	
Volume (vph)	23	660	182	327	512	98	98	67	352	76	15	46
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	695	192	344	539	103	103	71	371	80	16	48
RTOR Reduction (vph)	0	30	0	0	17	0	0	101	0	0	24	0
Lane Group Flow (vph)	24	857	0	344	625	0	0	444	0	0	120	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2				6		
Actuated Green, G (s)	2.2	24.2		17.5	39.5			24.8			24.8	
Effective Green, g (s)	2.7	24.7		18.0	40.0			25.3			25.3	
Actuated g/C Ratio	0.03	0.31		0.22	0.50			0.32			0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	60	1057		398	1727			489			281	
v/s Ratio Prot	0.01	c0.25		c0.19	0.18							
v/s Ratio Perm								c0.29			0.14	
v/c Ratio	0.40	0.81		0.86	0.36			0.91			0.43	
Uniform Delay, d1	37.9	25.5		29.8	12.2			26.2			21.6	
Progression Factor	0.95	0.97		1.36	1.36			1.00			1.00	
Incremental Delay, d2	3.7	5.8		12.3	0.4			20.4			1.0	
Delay (s)	39.7	30.6		52.9	17.0			46.6			22.7	
Level of Service	D	C		D	B			D			C	
Approach Delay (s)		30.8			29.5			46.6			22.7	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		33.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		83.2%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	1863	1583	1770	3539	1583	3433	1705	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	1863	1583	1770	3539	1583	3433	1705	
Volume (vph)	75	857	156	235	687	529	184	40	350	553	52	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	902	164	247	723	557	194	42	368	582	55	71
RTOR Reduction (vph)	0	0	44	0	0	157	0	0	240	0	31	0
Lane Group Flow (vph)	79	902	120	247	723	400	194	42	128	582	95	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	12.2	67.7	67.7	26.1	81.6	81.6	21.9	17.0	17.0	31.2	26.3	
Effective Green, g (s)	12.7	68.2	68.2	26.6	82.1	82.1	22.4	17.5	17.5	31.7	26.8	
Actuated g/C Ratio	0.08	0.43	0.43	0.17	0.51	0.51	0.14	0.11	0.11	0.20	0.17	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	140	1445	614	294	956	812	248	387	173	680	286	
v/s Ratio Prot	0.04	0.27		c0.14	c0.39		c0.11	0.01		c0.17	0.06	
v/s Ratio Perm			0.08			0.25			0.08			
v/c Ratio	0.56	0.62	0.20	0.84	0.76	0.49	0.78	0.11	0.74	0.86	0.33	
Uniform Delay, d1	71.0	35.9	28.7	64.6	31.0	25.4	66.4	64.2	69.1	61.9	58.7	
Progression Factor	1.05	1.04	1.18	1.05	1.11	1.27	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.8	0.5	0.1	14.5	4.1	1.6	14.8	0.1	15.7	10.3	0.7	
Delay (s)	77.1	37.6	34.1	82.5	38.4	33.8	81.2	64.3	84.8	72.3	59.4	
Level of Service	E	D	C	F	D	C	F	E	F	E	E	
Approach Delay (s)		39.8			43.8			82.2			70.0	
Approach LOS		D			D			F			E	
Intersection Summary												
HCM Average Control Delay		53.1			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		72.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												























9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95						0.91	0.91	
Frt	1.00	0.85	1.00	1.00						1.00	0.90	
Flt Protected	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (prot)	3539	1583	3433	3539						1610	3047	
Flt Permitted	1.00	1.00	0.95	1.00						0.95	1.00	
Satd. Flow (perm)	3539	1583	3433	3539						1610	3047	
Volume (vph)	0	1213	546	85	750	0	0	0	0	424	339	702
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1277	575	89	789	0	0	0	0	446	357	739
RTOR Reduction (vph)	0	0	137	0	0	0	0	0	0	0	122	0
Lane Group Flow (vph)	0	1277	438	89	789	0	0	0	0	446	975	0
Turn Type		Perm	Prot							Perm		
Protected Phases		4	3	8							6	
Permitted Phases			4									
Actuated Green, G (s)		36.6	36.6	4.4	45.5					25.5	25.5	
Effective Green, g (s)		37.1	37.1	4.9	46.0					26.0	26.0	
Actuated g/C Ratio		0.46	0.46	0.06	0.58					0.32	0.32	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1641	734	210	2035					523	990	
v/s Ratio Prot		c0.36		0.03	c0.22							
v/s Ratio Perm			0.28							0.28	0.32	
v/c Ratio		0.78	0.60	0.42	0.39					0.85	1.21dr	
Uniform Delay, d1		18.0	15.9	36.2	9.3					25.2	26.8	
Progression Factor		0.76	0.69	0.99	0.83					1.00	1.00	
Incremental Delay, d2		2.4	2.3	1.3	0.5					16.0	25.1	
Delay (s)		16.0	13.2	37.0	8.3					41.3	51.9	
Level of Service		B	B	D	A					D	D	
Approach Delay (s)		15.2			11.2			0.0			48.8	
Approach LOS		B			B			A			D	
Intersection Summary												
HCM Average Control Delay		26.5			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		76.7%			ICU Level of Service			D				
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												













10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	1.00	0.97	0.95		0.95	0.95	0.88	1.00	1.00	
Frt		1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)		5085	1583	3433	3518		1681	1695	2787	1770	1723	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)		5085	1583	3433	3518		1681	1695	2787	1770	1723	
Volume (vph)	0	815	822	178	407	17	283	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	858	865	187	428	18	298	19	601	9	9	9
RTOR Reduction (vph)	0	0	390	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	858	475	187	443	0	154	163	124	9	11	0
Turn Type	Prot	pm+ov			Prot	Split		Perm		Split		
Protected Phases	7	4	2	3	8	2		2	6		6	
Permitted Phases	4						2					
Actuated Green, G (s)	17.5	33.5	12.5	34.5			16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	18.0	34.5	13.0	35.0			16.5	16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.22	0.43	0.16	0.44			0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5			4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1144	683	558	1539			347	350	575	365	355	
v/s Ratio Prot	c0.17	c0.14	0.05	c0.13			0.09	0.10	0.01		c0.01	
v/s Ratio Perm	0.16						0.04					
v/c Ratio	0.75	0.70	0.34	0.29			0.44	0.47	0.22	0.02	0.03	
Uniform Delay, d1	28.9	18.5	29.7	14.5			27.7	27.9	26.4	25.3	25.4	
Progression Factor	1.41	5.43	1.21	1.23			0.83	0.83	1.85	1.00	1.00	
Incremental Delay, d2	2.7	3.5	0.3	0.4			3.8	4.1	0.8	0.1	0.2	
Delay (s)	43.4	103.8	36.2	18.2			26.9	27.3	49.6	25.5	25.5	
Level of Service	D	F	D	B			C	C	D	C	C	
Approach Delay (s)	73.7				23.5			41.8			25.5	
Approach LOS	E				C			D			C	
Intersection Summary												
HCM Average Control Delay	54.8			HCM Level of Service					D			
HCM Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					12.0			
Intersection Capacity Utilization	69.3%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3502		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3502		1770	1583
Volume (vph)	180	1214	766	57	137	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	1278	806	60	144	96
RTOR Reduction (vph)	0	0	5	0	0	71
Lane Group Flow (vph)	189	1278	861	0	144	25
Turn Type	Prot			Perm		
Protected Phases	7	4	8	6		
Permitted Phases				6		
Actuated Green, G (s)	9.6	50.5	36.4	20.5		20.5
Effective Green, g (s)	10.1	51.0	36.9	21.0		21.0
Actuated g/C Ratio	0.13	0.64	0.46	0.26		0.26
Clearance Time (s)	4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	433	2256	1615	465		416
v/s Ratio Prot	0.06	c0.36	0.25	c0.08		
v/s Ratio Perm				0.02		
v/c Ratio	0.44	0.57	0.53	0.31		0.06
Uniform Delay, d1	32.3	8.2	15.4	23.7		22.1
Progression Factor	0.84	2.23	1.00	1.00		1.00
Incremental Delay, d2	0.5	0.8	1.3	1.7		0.3
Delay (s)	27.8	19.1	16.7	25.4		22.4
Level of Service	C	B	B	C		C
Approach Delay (s)	20.2		16.7	24.2		
Approach LOS	C		B	C		
Intersection Summary						
HCM Average Control Delay			19.4	HCM Level of Service		B
HCM Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			80.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			47.8%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583		1745		1770	3527		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1687	1583		1745		1770	3527		1770	3539	1583
Volume (vph)	379	5	328	15	6	9	557	483	11	9	394	607
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	399	5	345	16	6	9	586	508	12	9	415	639
RTOR Reduction (vph)	0	0	278	0	9	0	0	1	0	0	0	501
Lane Group Flow (vph)	200	204	67	0	22	0	586	519	0	9	415	138
Turn Type	Split	Perm	Split		Prot		Prot		Perm		Perm	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	15.1	15.1	15.1		3.0		27.1	42.4		1.5	16.8	16.8
Effective Green, g (s)	15.6	15.6	15.6		3.5		27.6	42.9		2.0	17.3	17.3
Actuated g/C Ratio	0.19	0.19	0.19		0.04		0.35	0.54		0.02	0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	328	329	309		76		611	1891		44	765	342
v/s Ratio Prot	0.12	c0.12			c0.01		c0.33	0.15		0.01	c0.12	
v/s Ratio Perm			0.04									0.09
v/c Ratio	0.61	0.62	0.22		0.29		0.96	0.27		0.20	0.54	0.40
Uniform Delay, d1	29.4	29.5	27.1		37.1		25.6	10.1		38.2	27.8	26.9
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.14	1.01	2.85
Incremental Delay, d2	3.2	3.6	0.4		2.2		26.2	0.4		1.6	1.9	2.4
Delay (s)	32.6	33.1	27.4		39.2		51.9	10.4		45.1	30.0	79.2
Level of Service	C	C	C		D		D	B		D	C	E
Approach Delay (s)		30.4			39.2			32.4			59.7	
Approach LOS		C			D			C			E	
Intersection Summary												
HCM Average Control Delay		41.8										
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0						16.0				
Intersection Capacity Utilization		81.8%										
Analysis Period (min)		15										
c Critical Lane Group												










13: Project Dwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↰	↰			↰
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	942	0	0	668
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	992	0	0	703
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						1034
pX, platoon unblocked	0.86					
vC, conflicting volume	1695	992			992	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1806	992			992	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	75	298			697	
Direction, Lane #						
Volume Total	0	992	703			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.58	0.41			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		52.9%			ICU Level of Service	A
Analysis Period (min)		15				












14: Business Park Drive & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	211	73	45	220	0	222
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	222	77	47	232	0	234
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	279				684	163
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				684	163
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				100	73
cM capacity (veh/h)	1284				343	882
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	299	279	234			
Volume Left	222	0	0			
Volume Right	0	232	234			
cSH	1284	1700	882			
Volume to Capacity	0.17	0.16	0.27			
Queue Length 95th (ft)	16	0	27			
Control Delay (s)	6.6	0.0	10.6			
Lane LOS	A		B			
Approach Delay (s)	6.6	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			55.2%		ICU Level of Service	B
Analysis Period (min)			15			













15: Business Park Drive & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	197	32	13	429	373	32	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	207	34	14	452	393	34	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	663	213	426				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	663	213	426				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	47	96	99				
cM capacity (veh/h)	390	792	1129				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	207	34	14	226	226	262	165
Volume Left	207	0	14	0	0	0	0
Volume Right	0	34	0	0	0	0	34
cSH	390	792	1129	1700	1700	1700	1700
Volume to Capacity	0.53	0.04	0.01	0.13	0.13	0.15	0.10
Queue Length 95th (ft)	75	3	1	0	0	0	0
Control Delay (s)	24.3	9.7	8.2	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	22.2		0.2			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			4.8				
Intersection Capacity Utilization			29.4%	ICU Level of Service		A	
Analysis Period (min)			15				































16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1770	1863
Volume (vph)	299	372	570	285	228	447
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	315	392	600	300	240	471
RTOR Reduction (vph)	0	302	0	173	0	0
Lane Group Flow (vph)	315	90	600	127	240	471
Turn Type	Perm		Perm		Prot	
Protected Phases	8		2		1	
Permitted Phases	8		2			
Actuated Green, G (s)	14.2	14.2	26.5	26.5	9.5	40.5
Effective Green, g (s)	14.7	14.7	27.0	27.0	10.0	41.0
Actuated g/C Ratio	0.23	0.23	0.42	0.42	0.16	0.64
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	408	365	790	671	278	1199
v/s Ratio Prot	c0.18		c0.32		c0.14	
v/s Ratio Perm	0.06		0.08			
v/c Ratio	0.77	0.25	0.76	0.19	0.86	0.39
Uniform Delay, d1	22.9	20.0	15.6	11.5	26.2	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8	0.4	6.8	0.6	23.1	1.0
Delay (s)	31.7	20.3	22.4	12.1	49.3	6.4
Level of Service	C	C	C	B	D	A
Approach Delay (s)	25.4		18.9		20.9	
Approach LOS	C		B		C	
Intersection Summary						
HCM Average Control Delay			21.5	HCM Level of Service		C
HCM Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			63.7	Sum of lost time (s)		12.0
Intersection Capacity Utilization			69.2%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 	 	 	 	 	 	 	 	 	 	 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672		
Volume (vph)	58	539	45	122	584	316	69	17	123	470	48	104	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	61	567	47	128	615	333	73	18	129	495	51	109	
RTOR Reduction (vph)	0	0	37	0	0	264	0	47	54	0	58	0	
Lane Group Flow (vph)	61	567	10	128	615	69	73	31	15	495	102	0	
Turn Type	Prot		Perm		Prot		Perm		Prot		Perm		
Protected Phases	7		4		3		8		5		2		
Permitted Phases			4				8				2		
Actuated Green, G (s)	4.4	16.1	16.1	4.4	16.1	16.1	4.4	17.1	17.1	24.4	37.1		
Effective Green, g (s)	4.9	16.6	16.6	4.9	16.6	16.6	4.9	17.6	17.6	24.9	37.6		
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.22	0.22	0.31	0.47		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	108	734	328	210	734	328	210	344	331	551	786		
v/s Ratio Prot	0.03	c0.16		0.04		c0.17		c0.02		0.02		c0.28	c0.06
v/s Ratio Perm			0.01			0.04			0.01				
v/c Ratio	0.56	0.77	0.03	0.61	0.84	0.21	0.35	0.09	0.05	0.90	0.13		
Uniform Delay, d1	36.5	29.9	25.3	36.6	30.4	26.3	36.0	24.8	24.6	26.3	12.0		
Progression Factor	1.00	1.00	1.00	0.84	0.53	0.50	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	6.6	5.1	0.0	4.1	6.9	0.3	1.0	0.5	0.3	17.3	0.3		
Delay (s)	43.1	35.0	25.3	34.9	23.0	13.4	37.0	25.4	24.8	43.6	12.3		
Level of Service	D		C		C		B		D		B		
Approach Delay (s)	35.0			21.4			29.1			36.0			
Approach LOS	D			C			C			D			
Intersection Summary													
HCM Average Control Delay	29.2			HCM Level of Service					C				
HCM Volume to Capacity ratio	0.70												
Actuated Cycle Length (s)	80.0			Sum of lost time (s)					16.0				
Intersection Capacity Utilization	62.2%			ICU Level of Service					B				
Analysis Period (min)	15												
c Critical Lane Group													

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱↱↱	↱	↰	↱↱	↱	↰	↱↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.91	0.91	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1770	3146	1441	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1770	3146	1441	3433	1863	1583
Volume (vph)	209	805	118	448	672	408	122	228	464	439	210	228
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	220	847	124	472	707	429	128	240	488	462	221	240
RTOR Reduction (vph)	0	0	84	0	0	285	0	187	224	0	0	197
Lane Group Flow (vph)	220	847	40	472	707	144	128	275	42	462	221	43
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	25.5	25.5	11.5	25.0	25.0	11.3	12.2	12.2	12.8	13.7	13.7
Effective Green, g (s)	12.5	26.0	26.0	12.0	25.5	25.5	11.8	12.7	12.7	13.3	14.2	14.2
Actuated g/C Ratio	0.16	0.32	0.32	0.15	0.32	0.32	0.15	0.16	0.16	0.17	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	1653	514	515	1128	505	261	499	229	571	331	281
v/s Ratio Prot	c0.12	0.17		c0.14	c0.20		0.07	0.09		c0.13	c0.12	
v/s Ratio Perm			0.03			0.09			0.03			0.03
v/c Ratio	0.79	0.51	0.08	0.92	0.63	0.28	0.49	0.55	0.18	0.81	0.67	0.15
Uniform Delay, d1	32.5	21.9	18.7	33.5	23.2	20.4	31.3	31.0	29.2	32.1	30.7	27.8
Progression Factor	0.71	0.70	0.97	0.74	0.62	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.2	0.7	0.2	17.6	2.1	1.1	1.5	1.3	0.4	8.3	5.0	0.3
Delay (s)	32.4	16.1	18.4	42.5	16.5	19.4	32.8	32.3	29.6	40.4	35.7	28.1
Level of Service	C	B	B	D	B	B	C	C	C	D	D	C
Approach Delay (s)		19.3			24.9			31.5			36.1	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay		26.9										
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		67.3%										
Analysis Period (min)		15										
c Critical Lane Group												























19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱↱↱	↱	↰	↱↱	↱	↰	↱↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor		0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frt		0.95		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)		4843		1770	3539	1583		1653		1681	1681	1583
Flt Permitted		1.00		0.95	1.00	1.00		0.92		0.74	0.74	1.00
Satd. Flow (perm)		4843		1770	3539	1583		1541		1312	1312	1583
Volume (vph)	0	1165	542	78	1199	234	6	0	17	692	0	323
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1226	571	82	1262	246	6	0	18	728	0	340
RTOR Reduction (vph)	0	97	0	0	0	0	0	12	0	0	0	32
Lane Group Flow (vph)	0	1700	0	82	1262	246	0	12	0	364	364	308
Turn Type				Prot	Free	Perm				Perm		Perm
Protected Phases		4		3	8			2			6	
Permitted Phases					Free		2			6		6
Actuated Green, G (s)		36.1		4.9	45.5	80.0		25.5		25.5	25.5	25.5
Effective Green, g (s)		36.6		5.4	46.0	80.0		26.0		26.0	26.0	26.0
Actuated g/C Ratio		0.46		0.07	0.58	1.00		0.32		0.32	0.32	0.32
Clearance Time (s)		4.5		4.5	4.5			4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		2216		119	2035	1583		501		426	426	514
v/s Ratio Prot		c0.35		0.05	c0.36							
v/s Ratio Perm						0.16		0.01		c0.28	0.28	0.19
v/c Ratio		0.77		0.69	0.62	0.16		0.02		0.85	0.85	0.60
Uniform Delay, d1		18.1		36.5	11.2	0.0		18.4		25.2	25.2	22.6
Progression Factor		0.44		1.20	0.60	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2		2.1		13.7	1.3	0.2		0.0		15.3	15.3	1.9
Delay (s)		10.0		57.4	8.1	0.2		18.4		40.5	40.5	24.5
Level of Service		B		E	A	A		B		D	D	C
Approach Delay (s)		10.0			9.4			18.4			35.4	
Approach LOS		B			A			B			D	
Intersection Summary												
HCM Average Control Delay				15.9						B		
HCM Volume to Capacity ratio				0.80								
Actuated Cycle Length (s)				80.0						12.0		
Intersection Capacity Utilization				74.8%						D		
Analysis Period (min)				15								
c Critical Lane Group												
























20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.86	1.00		0.91	1.00	0.97	0.95	0.95		1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.85	0.85		0.98	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1770	6408	1583		5085	1583	3433	1504	1504		1748	
Flt Permitted	0.95	1.00	1.00		1.00	1.00	0.75	1.00	1.00		0.80	
Satd. Flow (perm)	1770	6408	1583		5085	1583	2695	1504	1504		1453	
Volume (vph)	19	1352	504	0	984	343	523	0	376	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1423	531	0	1036	361	551	0	396	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	20	20	0	2	0
Lane Group Flow (vph)	20	1423	531	0	1036	361	551	178	178	0	16	0
Turn Type	Prot		Free			Free	Perm		Perm	Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases			Free			Free	2		2		6	
Actuated Green, G (s)	4.2	48.9	80.0		40.2	80.0	22.1	22.1	22.1		22.1	
Effective Green, g (s)	4.7	49.4	80.0		40.7	80.0	22.6	22.6	22.6		22.6	
Actuated g/C Ratio	0.06	0.62	1.00		0.51	1.00	0.28	0.28	0.28		0.28	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	104	3957	1583		2587	1583	761	425	425		410	
v/s Ratio Prot	0.01	0.22			c0.20			0.12				
v/s Ratio Perm			c0.34			0.23	c0.20		0.12		0.01	
v/c Ratio	0.19	0.36	0.34		0.40	0.23	0.72	0.42	0.42		0.04	
Uniform Delay, d1	35.8	7.5	0.0		12.1	0.0	25.9	23.4	23.4		20.8	
Progression Factor	1.27	1.53	1.00		0.80	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.5	0.2	0.3		0.3	0.2	3.4	0.7	0.7		0.0	
Delay (s)	46.2	11.7	0.3		10.0	0.2	29.3	24.0	24.0		20.9	
Level of Service	D	B	A		B	A	C	C	C		C	
Approach Delay (s)		9.0			7.5		27.1				20.9	
Approach LOS		A			A		C				C	
Intersection Summary												
HCM Average Control Delay	12.5			HCM Level of Service				B				
HCM Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				8.0				
Intersection Capacity Utilization	48.4%			ICU Level of Service				A				
Analysis Period (min)	15											
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Flt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4887		1610	3339	1583	1610	3380	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4887		1610	3339	1583	1610	3380	1583
Volume (vph)	269	927	547	195	764	268	390	348	317	180	313	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	976	576	205	804	282	411	366	334	189	329	182
RTOR Reduction (vph)	0	0	364	0	75	0	0	0	267	0	0	150
Lane Group Flow (vph)	283	976	212	205	1011	0	250	527	67	167	351	32
Turn Type	Prot		Perm		Prot		Split		Perm		Split	Perm
Protected Phases	7	4			3	8		2	2		6	6
Permitted Phases			4						2			6
Actuated Green, G (s)	8.5	21.7	21.7	11.2	24.4		15.6	15.6	15.6	13.5	13.5	13.5
Effective Green, g (s)	9.0	22.2	22.2	11.7	24.9		16.1	16.1	16.1	14.0	14.0	14.0
Actuated g/C Ratio	0.11	0.28	0.28	0.15	0.31		0.20	0.20	0.20	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	982	439	259	1521		324	672	319	282	592	277
v/s Ratio Prot	0.08	c0.28		c0.12	0.21		0.16	c0.16		0.10	c0.10	
v/s Ratio Perm			0.13						0.04			0.02
v/c Ratio	0.73	0.99	0.48	0.79	0.66		0.77	0.78	0.21	0.59	0.59	0.11
Uniform Delay, d1	34.3	28.8	24.1	33.0	23.9		30.2	30.3	26.7	30.4	30.4	27.8
Progression Factor	0.66	0.62	1.03	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	26.5	3.6	15.1	2.3		10.8	6.0	0.3	3.3	1.6	0.2
Delay (s)	29.3	44.3	28.5	48.1	26.2		41.0	36.3	27.0	33.7	32.0	28.0
Level of Service	C	D	C	D	C		D	D	C	C	C	C
Approach Delay (s)		37.0			29.7			34.6			31.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay	33.7			HCM Level of Service				C				
HCM Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	73.0%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3390	1441	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3390	1441	1770	3539	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	150	774	324	115	510	133	316	511	102	276	529	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	815	341	121	537	140	333	538	107	291	557	242
RTOR Reduction (vph)	0	0	258	0	0	113	0	0	70	0	0	155
Lane Group Flow (vph)	158	815	83	121	537	27	333	538	37	291	557	87
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	10.1	21.5	21.5	5.5	16.9	16.9	16.5	30.5	30.5	14.5	28.5	28.5
Effective Green, g (s)	10.6	22.0	22.0	6.0	17.4	17.4	17.0	31.0	31.0	15.0	29.0	29.0
Actuated g/C Ratio	0.12	0.24	0.24	0.07	0.19	0.19	0.19	0.34	0.34	0.17	0.32	0.32
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	208	829	352	118	684	306	334	642	545	295	600	510
v/s Ratio Prot	c0.09	c0.24		c0.07	0.15		c0.19	0.29		0.16	c0.30	
v/s Ratio Perm			0.06			0.02			0.02			0.06
v/c Ratio	0.76	0.98	0.24	1.03	0.79	0.09	1.00	0.84	0.07	0.99	0.93	0.17
Uniform Delay, d1	38.5	33.8	27.3	42.0	34.5	29.8	36.5	27.2	19.8	37.4	29.5	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	26.9	0.3	89.8	5.9	0.1	48.1	12.4	0.2	48.2	22.8	0.7
Delay (s)	53.2	60.7	27.6	131.8	40.4	29.9	84.6	39.6	20.0	85.6	52.3	22.6
Level of Service	D	E	C	F	D	C	F	D	C	F	D	C
Approach Delay (s)		51.2			52.4			52.8			54.6	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay		52.7			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		89.9%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												













23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89	1.00	0.89	1.00	0.89
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3516		1770	3539	1583	1770	1658	1770	1658	1770	1653
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3516		1770	3539	1583	1770	1658	1770	1658	1770	1653
Volume (vph)	107	720	33	62	890	320	48	23	63	562	35	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	758	35	65	937	337	51	24	66	592	37	111
RTOR Reduction (vph)	0	4	0	0	0	118	0	61	0	0	58	0
Lane Group Flow (vph)	113	789	0	65	937	219	51	29	0	592	90	0
Turn Type	Prot	Perm		Prot	Perm	Prot		Prot		Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	21.9		4.4	20.7	20.7	3.3	6.3		39.4	42.4	
Effective Green, g (s)	6.1	22.4		4.9	21.2	21.2	3.8	6.8		39.9	42.9	
Actuated g/C Ratio	0.07	0.25		0.05	0.24	0.24	0.04	0.08		0.44	0.48	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	875		96	834	373	75	125		785	788	
v/s Ratio Prot	0.06	c0.22		0.04	c0.26		c0.03	0.02		c0.33	c0.05	
v/s Ratio Perm						0.14						
v/c Ratio	0.94	0.90		0.68	1.12	0.59	0.68	0.23		0.75	0.11	
Uniform Delay, d1	41.8	32.7		41.8	34.4	30.5	42.5	39.1		20.9	13.0	
Progression Factor	1.00	1.00		0.67	0.61	0.26	1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.8	14.3		15.3	69.4	5.9	22.4	1.0		4.1	0.1	
Delay (s)	105.6	47.0		43.4	90.2	13.9	64.9	40.1		25.1	13.1	
Level of Service	F	D		D	F	B	E	D		C	B	
Approach Delay (s)		54.3			68.7			49.1			22.7	
Approach LOS		D			E			D			C	
Intersection Summary												
HCM Average Control Delay		52.8			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		80.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												







24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↓	↑↑					↓	↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					3433	1583	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					3433	1583	
Volume (vph)	0	969	376	119	1004	0	0	0	0	626	0	268
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1020	396	125	1057	0	0	0	0	659	0	282
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	68	0
Lane Group Flow (vph)	0	1020	308	125	1057	0	0	0	0	659	214	0
Turn Type		Perm		Prot						Prot		
Protected Phases		4		3		8				1		6
Permitted Phases		4										
Actuated Green, G (s)		33.5		14.5		52.5				28.5		28.5
Effective Green, g (s)		34.0		15.0		53.0				29.0		29.0
Actuated g/C Ratio		0.38		0.17		0.59				0.32		0.32
Clearance Time (s)		4.5		4.5		4.5				4.5		4.5
Vehicle Extension (s)		3.0		3.0		3.0				3.0		3.0
Lane Grp Cap (vph)		1337		598		2084				1106		510
v/s Ratio Prot		c0.29		0.07		c0.30				c0.19		0.13
v/s Ratio Perm		0.19										
v/c Ratio		0.76		0.51		0.42				0.60		0.42
Uniform Delay, d1		24.5		21.6		33.6				25.6		23.9
Progression Factor		0.51		0.44		1.24				1.00		1.00
Incremental Delay, d2		2.6		1.9		0.9				0.9		2.5
Delay (s)		15.1		11.4		42.7				26.5		26.4
Level of Service		B		B		D				C		C
Approach Delay (s)		14.1				20.9			0.0			26.4
Approach LOS		B				C			A			C
Intersection Summary												
HCM Average Control Delay		19.6		HCM Level of Service					B			
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		90.0		Sum of lost time (s)					8.0			
Intersection Capacity Utilization		66.5%		ICU Level of Service					C			
Analysis Period (min)		15										
c Critical Lane Group												





















25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↓	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	3433	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	3433	1583
Volume (vph)	1594	0	0	700	423	255
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1678	0	0	737	445	268
RTOR Reduction (vph)	0	0	0	0	0	14
Lane Group Flow (vph)	1678	0	0	737	445	254
Turn Type	Perm					
Protected Phases	4			8	2	
Permitted Phases				2		
Actuated Green, G (s)	61.5			61.5	19.5	19.5
Effective Green, g (s)	62.0			62.0	20.0	20.0
Actuated g/C Ratio	0.69			0.69	0.22	0.22
Clearance Time (s)	4.5			4.5	4.5	4.5
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2438			2438	763	352
v/s Ratio Prot	c0.47			0.21	0.13	
v/s Ratio Perm				c0.16		
v/c Ratio	0.69			0.30	0.58	0.72
Uniform Delay, d1	8.3			5.5	31.3	32.4
Progression Factor	0.28			1.00	1.00	1.00
Incremental Delay, d2	1.1			0.3	1.1	7.1
Delay (s)	3.4			5.8	32.4	39.5
Level of Service	A			A	C	D
Approach Delay (s)	3.4			5.8	35.1	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			11.2	HCM Level of Service		B
HCM Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			90.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			66.5%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						















26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1731			1823	1583	1770	3539	1583	1770	3534	
Flt Permitted		0.85			0.86	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1504			1601	1583	1770	3539	1583	1770	3534	
Volume (vph)	11	4	9	18	24	222	8	780	24	119	677	7
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	4	9	19	25	234	8	821	25	125	713	7
RTOR Reduction (vph)	0	8	0	0	0	201	0	0	12	0	1	0
Lane Group Flow (vph)	0	17	0	0	44	33	8	821	13	125	719	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		6.5			6.5	6.5	0.9	24.6	24.6	4.7	28.4	
Effective Green, g (s)		7.0			7.0	7.0	1.4	25.1	25.1	5.2	28.9	
Actuated g/C Ratio		0.14			0.14	0.14	0.03	0.51	0.51	0.11	0.59	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		214			227	225	50	1802	806	187	2072	
v/s Ratio Prot							0.00	c0.23		c0.07	c0.20	
v/s Ratio Perm		0.01			c0.03	0.02			0.01			
v/c Ratio		0.08			0.19	0.15	0.16	0.46	0.02	0.67	0.35	
Uniform Delay, d1		18.4			18.7	18.5	23.4	7.7	6.0	21.2	5.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.4	0.3	1.5	0.2	0.0	8.7	0.1	
Delay (s)		18.5			19.1	18.8	24.9	7.9	6.0	29.9	5.4	
Level of Service		B			B	B	C	A	A	C	A	
Approach Delay (s)		18.5			18.9			8.0			9.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay		10.1			HCM Level of Service				B			
HCM Volume to Capacity ratio		0.46										
Actuated Cycle Length (s)		49.3			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		48.6%			ICU Level of Service				A			
Analysis Period (min)		15										
c Critical Lane Group												

27: Millbrae Ave & Primrose Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 											
Sign Control	Free											
Grade	0%											
Volume (veh/h)	1	142	4	7	261	2	2	0	2	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	149	4	7	275	2	2	0	2	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None											
Median storage (veh)	None											
Upstream signal (ft)	1180											
pX, platoon unblocked												
vC, conflicting volume	277			154			445	445	152	446	446	276
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			154			445	445	152	446	446	276
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	100	100	100
cM capacity (veh/h)	1286			1427			520	505	895	519	504	763
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	155	284	4	2								
Volume Left	1	7	2	1								
Volume Right	4	2	2	0								
cSH	1286	1427	658	511								
Volume to Capacity	0.00	0.01	0.01	0.00								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.1	0.2	10.5	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.5	12.1								
Approach LOS				B	B							
Intersection Summary												
Average Delay				0.3								
Intersection Capacity Utilization				28.6%	ICU Level of Service				A			
Analysis Period (min)				15								

28: Millbrae Ave & Whistler Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	129	2	4	275	8	1	10	0	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	136	2	4	289	8	1	11	0	3	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	298			138			445	447	137	448	444	294
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	298			138			445	447	137	448	444	294
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	100	99	100	100
cM capacity (veh/h)	1263			1446			520	504	912	511	506	746
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	302	12	5								
Volume Left	2	4	1	3								
Volume Right	2	8	0	1								
cSH	1263	1446	505	544								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.1	0.1	12.3	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	12.3	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		27.2%		ICU Level of Service		A						
Analysis Period (min)		15										

29: Millbrae Ave & Langner Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	153	10	4	336	13	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	161	11	4	354	14	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			172		528	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		528	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1405		509	878
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	172	358	23			
Volume Left	0	4	14			
Volume Right	11	0	9			
cSH	1700	1405	615			
Volume to Capacity	0.10	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.1	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		30.9%		ICU Level of Service		A
Analysis Period (min)		15				

30: Millbrae Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	150	16	17	244	0	100	0	29	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	158	17	18	257	0	105	0	31	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	257			175			459	459	166	489	467	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			175			459	459	166	489	467	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			79	100	97	100	100	100
cM capacity (veh/h)	1308			1402			507	492	878	467	487	782
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	175	275	136	0								
Volume Left	0	18	105	0								
Volume Right	17	0	31	0								
cSH	1308	1402	561	1700								
Volume to Capacity	0.00	0.01	0.24	0.00								
Queue Length 95th (ft)	0	1	24	0								
Control Delay (s)	0.0	0.6	13.5	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	0.6	13.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization		40.0%		ICU Level of Service		A						
Analysis Period (min)		15										

31: Millbrae Ave & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	137	32	0	235	32	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	144	34	0	247	34	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			178		408	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		408	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	100
cM capacity (veh/h)			1398		599	884
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	178	247	34			
Volume Left	0	0	34			
Volume Right	34	0	0			
cSH	1700	1398	599			
Volume to Capacity	0.10	0.00	0.06			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		22.4%		ICU Level of Service		A
Analysis Period (min)		15				

1: Wilfred Ave & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	160	137	15	973	186	555
v/c Ratio	0.10	0.70	0.39	0.13	0.94	0.87	0.42
Control Delay	19.1	51.1	14.8	44.6	34.9	76.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	51.1	14.8	44.6	34.9	76.1	7.1
Queue Length 50th (ft)	6	84	17	8	456	106	100
Queue Length 95th (ft)	30	#154	67	28	#776	#235	236
Internal Link Dist (ft)	885	1130			954		1280
Turn Bay Length (ft)			35	150		150	
Base Capacity (vph)	352	270	393	117	1068	214	1335
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.59	0.35	0.13	0.91	0.87	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	←	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	318	341	351	77	587	84
v/c Ratio	0.15	0.58	0.75	0.25	0.12	0.57	0.14
Control Delay	36.7	31.9	42.8	19.8	16.4	4.0	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	31.9	42.8	19.8	16.4	4.0	16.3
Queue Length 50th (ft)	10	69	234	99	24	8	26
Queue Length 95th (ft)	32	104	m351	m112	m52	56	60
Internal Link Dist (ft)		1080		1070	1920		2200
Turn Bay Length (ft)	150		150				
Base Capacity (vph)	143	757	664	1786	655	1028	618
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.42	0.51	0.20	0.12	0.57	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	↗	→	↘	←	↑	↓
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	887	344	642	545	144
v/c Ratio	0.18	0.82	0.86	0.34	0.92	0.44
Control Delay	35.7	30.7	56.4	15.8	42.4	19.9
Queue Delay	0.0	0.0	0.0	0.0	4.3	0.3
Total Delay	35.7	30.7	56.4	15.8	46.7	20.2
Queue Length 50th (ft)	12	215	280	191	187	39
Queue Length 95th (ft)	m21	#306	m#401	311	#376	90
Internal Link Dist (ft)		1070		550	687	2220
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	134	1088	408	1861	637	359
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	1	0	0	48	29
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.82	0.84	0.34	0.93	0.44
Intersection Summary						
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m	Volume for 95th percentile queue is metered by upstream signal.					

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	79	902	164	247	723	557	194	42	368	582	126
v/c Ratio	0.56	0.62	0.25	0.84	0.76	0.57	0.79	0.11	0.89	0.86	0.40
Control Delay	82.2	41.8	22.8	86.2	42.1	17.5	87.5	60.6	42.5	74.9	43.6
Queue Delay	0.0	0.7	0.0	43.6	30.5	1.9	0.0	0.0	0.5	76.9	0.0
Total Delay	82.2	42.6	22.8	129.8	72.6	19.5	87.5	60.6	43.0	151.8	43.6
Queue Length 50th (ft)	84	453	63	257	625	94	198	21	108	304	83
Queue Length 95th (ft)	m106	m596	m112	m294	m#902	m253	282	39	227	376	145
Internal Link Dist (ft)		550			220			110			270
Turn Bay Length (ft)	150		150				150		100	275	
Base Capacity (vph)	183	1447	659	336	957	970	310	641	507	726	392
Starvation Cap Reductn	0	250	0	102	266	260	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	17	225	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.75	0.25	1.06	1.05	0.78	0.63	0.07	0.75	1.16	0.32
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.										
m	Volume for 95th percentile queue is metered by upstream signal.										

9: Wilfred Avenue & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1277	575	89	789	446	1096
v/c Ratio	0.76	0.65	0.35	0.39	0.85	1.21dr
Control Delay	15.8	8.5	38.6	8.4	43.0	47.8
Queue Delay	5.5	2.0	0.0	0.1	0.0	30.3
Total Delay	21.2	10.4	38.6	8.5	43.0	78.1
Queue Length 50th (ft)	372	209	19	49	226	256
Queue Length 95th (ft)	269	m102	43	87	#405	#406
Internal Link Dist (ft)	220		466			348
Turn Bay Length (ft)			300		250	
Base Capacity (vph)	1681	886	257	2035	523	1112
Starvation Cap Reductn	344	174	0	0	0	0
Spillback Cap Reductn	0	0	0	339	0	97
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.81	0.35	0.47	0.85	1.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

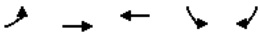
	→	↘	↙	←	↗	↑	↖	↘	↓
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	858	865	187	446	154	163	601	9	18
v/c Ratio	0.75	0.81	0.34	0.29	0.44	0.47	0.57	0.02	0.05
Control Delay	43.6	14.5	37.7	18.2	27.4	27.8	7.1	25.7	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	43.6	14.5	37.7	18.2	27.4	27.8	7.4	25.7	18.8
Queue Length 50th (ft)	181	294	52	112	50	53	0	4	4
Queue Length 95th (ft)	187	311	85	156	m108	m113	84	16	21
Internal Link Dist (ft)	466			345		380			270
Turn Bay Length (ft)			150		150			200	
Base Capacity (vph)	1144	1073	558	1542	347	350	1052	365	363
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	103	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.81	0.34	0.29	0.44	0.47	0.63	0.02	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.


11: Wilfred Avenue & Robert Lakes Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

					
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	189	1278	866	144	96
v/c Ratio	0.44	0.57	0.53	0.31	0.20
Control Delay	29.3	19.3	17.1	25.9	6.6
Queue Delay	0.0	1.9	0.0	0.0	0.0
Total Delay	29.3	21.2	17.1	25.9	6.6
Queue Length 50th (ft)	54	303	154	58	0
Queue Length 95th (ft)	m70	310	222	106	34
Internal Link Dist (ft)		345	164	232	
Turn Bay Length (ft)	80			200	
Base Capacity (vph)	901	2256	1621	465	486
Starvation Cap Reductn	0	773	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.86	0.53	0.31	0.20
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

									
Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	204	345	31	586	520	9	415	639
v/c Ratio	0.61	0.62	0.59	0.20	1.10	0.24	0.06	0.40	0.70
Control Delay	36.8	37.2	7.5	29.4	99.9	10.5	38.6	26.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	36.8	37.2	7.5	29.4	99.9	10.5	38.6	26.5	9.4
Queue Length 50th (ft)	96	98	0	10	~339	40	5	87	12
Queue Length 95th (ft)	152	156	61	35	#531	147	m6	m#171	113
Internal Link Dist (ft)		284		118		214		380	
Turn Bay Length (ft)	250		250		200		100		175
Base Capacity (vph)	441	443	670	183	531	2175	177	1048	919
Starvation Cap Reductn	0	0	0	0	0	0	0	0	30
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.46	0.51	0.17	1.10	0.24	0.05	0.40	0.72
Intersection Summary									
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.									
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.									
m Volume for 95th percentile queue is metered by upstream signal.									

16: Rohnert Park Expy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	315	392	600	300	240	471
v/c Ratio	0.77	0.59	0.76	0.36	0.86	0.39
Control Delay	37.5	6.7	24.1	3.1	58.8	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	6.7	24.1	3.1	58.8	6.9
Queue Length 50th (ft)	115	0	197	0	95	79
Queue Length 95th (ft)	#221	60	#359	40	#213	129
Internal Link Dist (ft)	480		3920			2550
Turn Bay Length (ft)		175		450	700	
Base Capacity (vph)	436	685	790	844	278	1199
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.57	0.76	0.36	0.86	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	61	567	47	128	615	333	73	78	69	495	160
v/c Ratio	0.46	0.77	0.13	0.50	0.84	0.56	0.28	0.18	0.17	0.93	0.18
Control Delay	47.1	38.0	9.3	35.8	26.4	5.0	38.1	11.7	8.3	54.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	38.0	9.3	35.8	26.4	5.0	38.1	11.7	8.3	54.9	5.8
Queue Length 50th (ft)	30	141	0	20	120	0	18	7	0	239	14
Queue Length 95th (ft)	67	197	26	m43	#228	6	38	43	33	#424	48
Internal Link Dist (ft)		1540			220			1010			520
Turn Bay Length (ft)	160		200	250		170	130		130	100	
Base Capacity (vph)	133	752	373	257	752	599	257	425	417	531	879
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.75	0.13	0.50	0.82	0.56	0.28	0.18	0.17	0.93	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

18: Rohnert Park Expy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	220	847	124	472	707	429	128	462	266	462	221	240
v/c Ratio	0.79	0.51	0.21	0.92	0.63	0.54	0.49	0.67	0.59	0.81	0.67	0.50
Control Delay	38.3	16.2	4.6	47.2	16.9	4.7	40.8	20.8	9.6	48.0	40.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	16.2	4.6	47.2	16.9	4.7	40.8	20.8	9.6	48.0	40.5	8.0
Queue Length 50th (ft)	69	83	8	130	143	36	60	60	0	116	103	0
Queue Length 95th (ft)	m106	m93	m13	#211	167	48	#136	104	64	#237	169	56
Internal Link Dist (ft)		320		520			554			480		
Turn Bay Length (ft)	200		250	350		155	250		250	175		175
Base Capacity (vph)	288	1653	598	515	1126	790	260	843	516	572	396	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.51	0.21	0.92	0.63	0.54	0.49	0.55	0.52	0.81	0.56	0.46

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

19: Rohnert Park Expy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1797	82	1262	246	24	364	364	340
v/c Ratio	0.76	0.56	0.62	0.16	0.05	0.85	0.85	0.62
Control Delay	9.8	57.4	8.7	0.2	9.5	44.6	44.6	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	57.4	8.7	0.2	9.5	44.6	44.6	24.3
Queue Length 50th (ft)	146	42	226	0	2	165	165	114
Queue Length 95th (ft)	357	m#87	148	m0	17	#311	#311	197
Internal Link Dist (ft)	520		960		428		378	
Turn Bay Length (ft)		225				400		400
Base Capacity (vph)	2363	146	2034	1583	572	476	476	604
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.56	0.62	0.16	0.04	0.76	0.76	0.56

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	20	1423	531	1036	361	551	198	198	18
v/c Ratio	0.11	0.36	0.34	0.38	0.23	0.72	0.44	0.44	0.04
Control Delay	40.6	12.8	0.3	10.9	0.2	31.1	22.1	22.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	12.8	0.3	10.9	0.2	31.1	22.1	22.1	15.9
Queue Length 50th (ft)	11	122	0	77	0	127	71	71	5
Queue Length 95th (ft)	m13	190	m0	109	m0	158	116	116	18
Internal Link Dist (ft)		960		360			386		420
Turn Bay Length (ft)	190					225			
Base Capacity (vph)	243	3957	1583	2759	1583	1004	578	578	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.36	0.34	0.38	0.23	0.55	0.34	0.34	0.03
Intersection Summary									
m Volume for 95th percentile queue is metered by upstream signal.									

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	283	976	576	205	1086	250	527	334	167	351	182
v/c Ratio	0.73	0.99	0.72	0.79	0.68	0.77	0.78	0.57	0.59	0.59	0.43
Control Delay	35.0	47.5	9.9	59.6	24.7	47.9	39.7	7.7	38.9	34.3	8.0
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	47.5	10.5	59.6	24.7	47.9	39.7	7.7	38.9	34.3	8.0
Queue Length 50th (ft)	75	~274	163	102	158	129	137	0	84	88	0
Queue Length 95th (ft)	#123	#387	82	#240	213	#250	#200	65	148	129	50
Internal Link Dist (ft)		360			1350		601			660	
Turn Bay Length (ft)	250			200		250		175	150		150
Base Capacity (vph)	386	981	803	259	1595	332	689	592	332	697	471
Starvation Cap Reductn	0	0	48	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.99	0.76	0.79	0.68	0.75	0.76	0.56	0.50	0.50	0.39
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											

22: Gravenstien Hwy & Stony Point Road
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	815	341	121	537	140	333	538	107	291	557	242
v/c Ratio	0.76	0.98	0.56	1.03	0.79	0.33	1.00	0.84	0.17	0.99	0.93	0.36
Control Delay	61.9	62.6	7.3	134.5	44.3	8.2	87.3	40.8	5.1	88.9	53.9	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	62.6	7.3	134.5	44.3	8.2	87.3	40.8	5.1	88.9	53.9	5.6
Queue Length 50th (ft)	88	253	0	~72	154	0	191	279	0	167	304	5
Queue Length 95th (ft)	#182	#385	75	#183	#230	48	#363	#454	34	#327	#505	57
Internal Link Dist (ft)		689			6630			734			980	
Turn Bay Length (ft)	350		450	500		150	550		675	500		625
Base Capacity (vph)	215	829	610	118	682	419	334	642	615	295	600	665
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.98	0.56	1.03	0.79	0.33	1.00	0.84	0.17	0.99	0.93	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

23: Gravenstien Hwy & Redwood Drive
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	793	65	937	337	51	90	592	148
v/c Ratio	0.93	0.81	0.55	1.04	0.65	0.43	0.44	0.77	0.17
Control Delay	111.2	38.5	44.2	60.8	9.8	52.2	21.6	31.9	5.7
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.2	39.0	44.2	60.8	9.8	52.2	21.6	31.9	5.7
Queue Length 50th (ft)	65	226	37	~311	6	28	13	286	12
Queue Length 95th (ft)	#171	#331	m#81	#415	33	65	56	#513	47
Internal Link Dist (ft)		6630		350			200		236
Turn Bay Length (ft)	225		150		80	50		225	
Base Capacity (vph)	121	985	118	904	519	118	367	767	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	30	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.83	0.55	1.04	0.65	0.43	0.25	0.77	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Gravenstien Hwy & US-101 SB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	→	↘	↙	←	↗	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1020	396	125	1057	659	282
v/c Ratio	0.76	0.58	0.42	0.51	0.60	0.49
Control Delay	15.3	8.4	46.7	18.6	28.3	18.7
Queue Delay	1.1	0.4	0.0	0.3	0.0	0.0
Total Delay	16.4	8.8	46.7	18.9	28.3	18.7
Queue Length 50th (ft)	152	69	70	253	160	79
Queue Length 95th (ft)	184	m99	m125	314	216	154
Internal Link Dist (ft)	350			370		585
Turn Bay Length (ft)		50	100		425	
Base Capacity (vph)	1337	686	295	2084	1106	579
Starvation Cap Reductn	134	60	0	428	0	0
Spillback Cap Reductn	17	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.63	0.42	0.64	0.60	0.49
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

25: Gravenstien Hwy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

2020 + Alternative H (Mitigated)
PM Peak

	→	←	↘	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1678	737	445	268
v/c Ratio	0.69	0.30	0.58	0.73
Control Delay	3.9	6.7	33.5	41.4
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	3.9	6.7	33.5	41.4
Queue Length 50th (ft)	35	74	117	133
Queue Length 95th (ft)	239	137	144	192
Internal Link Dist (ft)	370	312	431	
Turn Bay Length (ft)			395	275
Base Capacity (vph)	2438	2438	1221	574
Starvation Cap Reductn	62	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.30	0.36	0.47
Intersection Summary				

26: Millbrae Ave & Stony Point Road
Graton Rancheria Casino & Hotel
















2020 + Alternative H (Mitigated)
PM Peak

	→	←	↖	↗	↑	↘	↙	↓
Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	44	234	8	821	25	125	720
v/c Ratio	0.09	0.15	0.50	0.04	0.44	0.03	0.43	0.31
Control Delay	14.7	18.1	7.4	23.1	10.5	5.0	22.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	18.1	7.4	23.1	10.5	5.0	22.7	5.7
Queue Length 50th (ft)	4	10	0	2	85	0	27	30
Queue Length 95th (ft)	20	33	45	13	154	11	80	117
Internal Link Dist (ft)	926	1100			860			804
Turn Bay Length (ft)			120	505		120	490	
Base Capacity (vph)	511	532	658	205	2037	922	323	2421
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.08	0.36	0.04	0.40	0.03	0.39	0.30
Intersection Summary								

**NEAR-TERM 2008 + VARIANT H-SUB1
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**





















4: Wilfred Avenue & Langner Ave
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Volume (veh/h)	10	132	129	89	181	8	96	19	129	10	10	10	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	11	139	136	94	191	8	101	20	136	11	11	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type									None		None		
Median storage (veh)													
Upstream signal (ft)	1160												
pX, platoon unblocked	0.99						0.99	0.99			0.99	0.99	0.99
vC, conflicting volume	199	275					626	614	207	756	678	195	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	187	275					620	609	207	752	673	183	
tC, single (s)	4.1	4.1					7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2	2.2					3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	99	93					72	95	84	96	97	99	
cM capacity (veh/h)	1367	1288					357	372	834	243	341	847	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	285	293	257	32									
Volume Left	11	94	101	11									
Volume Right	136	8	136	11									
cSH	1367	1288	514	364									
Volume to Capacity	0.01	0.07	0.50	0.09									
Queue Length 95th (ft)	1	6	69	7									
Control Delay (s)	0.4	3.0	18.8	15.8									
Lane LOS	A	A	C	C									
Approach Delay (s)	0.4	3.0	18.8	15.8									
Approach LOS					C	C							
Intersection Summary													
Average Delay	7.3												
Intersection Capacity Utilization	60.3%			ICU Level of Service					B				
Analysis Period (min)	15												









5: Wilfred Avenue & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0		4.0	4.0		
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00		1.00			
Frt		0.97		1.00	0.99			1.00	0.85		0.99			
Flt Protected		1.00		0.95	1.00			0.97	1.00		0.96			
Satd. Flow (prot)		1805		1770	1838			1814	1583		1779			
Flt Permitted		0.97		0.95	1.00			0.90	1.00		0.86			
Satd. Flow (perm)		1758		1770	1838			1673	1583		1595			
Volume (vph)	15	198	57	294	256	25	22	19	441	17	3	1	1	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	16	208	60	309	269	26	23	20	464	18	3	1	1	
RTOR Reduction (vph)	0	13	0	0	6	0	0	0	285	0	1	0	0	
Lane Group Flow (vph)	0	271	0	309	289	0	0	43	179	0	21	0	0	
Turn Type	Perm			Prot			Perm			Perm			Perm	
Protected Phases	4			3			8			2			6	
Permitted Phases	4						2			2			6	
Actuated Green, G (s)	16.6			19.5			40.6			30.4			30.4	
Effective Green, g (s)	17.1			20.0			41.1			30.9			30.9	
Actuated g/C Ratio	0.21			0.25			0.51			0.39			0.39	
Clearance Time (s)	4.5			4.5			4.5			4.5			4.5	
Vehicle Extension (s)	3.0			3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	376			443			944			646			611	
v/s Ratio Prot				c0.17			0.16							
v/s Ratio Perm	c0.15									0.03			c0.11	
v/c Ratio	0.72			0.70			0.31			0.07			0.29	
Uniform Delay, d1	29.2			27.3			11.2			15.5			17.0	
Progression Factor	1.00			1.63			0.73			1.02			1.11	
Incremental Delay, d2	6.7			4.0			0.2			0.2			1.2	
Delay (s)	35.9			48.4			8.3			16.0			20.2	
Level of Service	D			D			A			B			C	
Approach Delay (s)	35.9			28.8			19.8			16.0				
Approach LOS	D			C			B			B				
Intersection Summary														
HCM Average Control Delay	26.8			HCM Level of Service						C				
HCM Volume to Capacity ratio	0.52													
Actuated Cycle Length (s)	80.0			Sum of lost time (s)						12.0				
Intersection Capacity Utilization	55.4%			ICU Level of Service						B				
Analysis Period (min)	15													
c Critical Lane Group														









6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	1837		1770	1852			1676			1740	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.86	
Satd. Flow (perm)	1770	1837		1770	1852			1617			1537	
Volume (vph)	11	587	59	82	549	23	21	14	75	14	2	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	618	62	86	578	24	22	15	79	15	2	6
RTOR Reduction (vph)	0	5	0	0	2	0	0	57	0	0	4	0
Lane Group Flow (vph)	12	675	0	86	600	0	0	59	0	0	19	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	1.1	38.1		6.6	43.6			21.8			21.8	
Effective Green, g (s)	1.6	38.6		7.1	44.1			22.3			22.3	
Actuated g/C Ratio	0.02	0.48		0.09	0.55			0.28			0.28	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	35	886		157	1021			451			428	
v/s Ratio Prot	0.01	c0.37		c0.05	0.32							
v/s Ratio Perm								c0.04			0.01	
v/c Ratio	0.34	0.76		0.55	0.59			0.13			0.04	
Uniform Delay, d1	38.7	16.9		34.9	11.9			21.6			21.1	
Progression Factor	0.84	1.36		0.95	1.42			1.00			1.00	
Incremental Delay, d2	4.8	3.3		3.1	0.7			0.6			0.2	
Delay (s)	37.3	26.3		36.5	17.6			22.2			21.3	
Level of Service	D	C		D	B			C			C	
Approach Delay (s)		26.5			19.9			22.2			21.3	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM Average Control Delay		23.1			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		55.5%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	0.95	1.00	0.97	1.00		
Frt	1.00	0.98		1.00	0.85	1.00	1.00	0.85	1.00	0.93		
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1833		1770	1863	1583	1770	3539	1583	3433	1739	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1833		1770	1863	1583	1770	3539	1583	3433	1739	
Volume (vph)	48	561	67	180	379	541	172	154	267	425	128	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	51	591	71	189	399	569	181	162	281	447	135	107
RTOR Reduction (vph)	0	5	0	0	0	324	0	0	246	0	36	0
Lane Group Flow (vph)	51	657	0	189	399	245	181	162	35	447	206	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	3.5	28.5		9.0	34.0	34.0	8.5	9.5	9.5	15.0	16.0	
Effective Green, g (s)	4.0	29.0		9.5	34.5	34.5	9.0	10.0	10.0	15.5	16.5	
Actuated g/C Ratio	0.05	0.36		0.12	0.43	0.43	0.11	0.12	0.12	0.19	0.21	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	89	664		210	803	683	199	442	198	665	359	
v/s Ratio Prot	0.03	c0.36		c0.11	0.21		c0.10	0.05		c0.13	0.12	
v/s Ratio Perm						0.15			0.02			
v/c Ratio	0.57	0.99		0.90	0.50	0.36	0.91	0.37	0.18	0.67	0.57	
Uniform Delay, d1	37.2	25.3		34.8	16.5	15.3	35.1	32.1	31.3	29.9	28.6	
Progression Factor	1.24	0.68		1.17	1.22	2.65	1.00	1.00	1.00	1.15	1.17	
Incremental Delay, d2	5.8	26.0		32.2	1.9	1.3	39.0	0.5	0.4	2.7	2.2	
Delay (s)	51.8	43.1		73.0	22.0	41.9	74.1	32.6	31.8	37.0	35.7	
Level of Service	D	D		E	C	D	E	C	C	D	D	
Approach Delay (s)		43.7			40.1			44.3			36.5	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM Average Control Delay		41.0			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		79.4%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

10: Wilfred Avenue & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.95	0.95	0.95	0.95	0.88	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.85	1.00	0.96	1.00	0.95	0.98	1.00	0.95	1.00	0.97	1.00
Satd. Flow (prot)	5085	1583	3433	3392	1681	1737	2787	1770	1814	1770	1814	1770
Flt Permitted	1.00	1.00	0.95	1.00	0.95	0.98	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	5085	1583	3433	3392	1681	1737	2787	1770	1814	1770	1814	1770
Volume (vph)	0	497	603	409	303	116	231	107	572	42	41	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	523	635	431	319	122	243	113	602	44	43	9
RTOR Reduction (vph)	0	0	492	0	41	0	0	0	478	0	7	0
Lane Group Flow (vph)	0	523	143	431	400	0	174	182	124	44	45	0
Turn Type	Prot	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split
Protected Phases	7	4	3	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	17.5	17.5	12.5	34.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Effective Green, g (s)	18.0	18.0	13.0	35.0	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Actuated g/C Ratio	0.22	0.22	0.16	0.44	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1144	356	558	1484	347	358	575	365	374	365	374	365
v/s Ratio Prot	c0.10	c0.13	0.12	0.10	c0.10	c0.10	c0.02	0.02	c0.02	0.02	c0.02	0.02
v/s Ratio Perm	0.46	0.40	0.77	0.27	0.50	0.51	0.22	0.12	0.12	0.12	0.12	0.12
Uniform Delay, d1	26.8	26.4	32.1	14.3	28.1	28.2	26.4	25.8	25.8	25.8	25.8	25.8
Progression Factor	1.43	4.63	1.19	1.24	0.87	0.87	1.56	0.84	0.82	0.82	0.82	0.82
Incremental Delay, d2	1.1	2.9	6.1	0.4	4.7	4.7	0.8	0.7	0.7	0.7	0.7	0.7
Delay (s)	39.3	125.1	44.2	18.1	29.1	29.1	41.8	22.3	21.8	21.8	21.8	21.8
Level of Service	D	F	D	B	C	C	D	C	C	C	C	C
Approach Delay (s)	86.3			31.0	37.1			22.1				
Approach LOS	F			C	D			C				
Intersection Summary												
HCM Average Control Delay	53.4			HCM Level of Service	D							
HCM Volume to Capacity ratio	0.45											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)	16.0							
Intersection Capacity Utilization	62.3%			ICU Level of Service	B							
Analysis Period (min)	15											
c Critical Lane Group												

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	1.00	1.00	0.85	0.96	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1681	1686	1583	1741	1770	3537	1770	3537	1770	3537	1770	3537
Flt Permitted	0.95	0.95	1.00	0.98	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1681	1686	1583	1741	1770	3537	1770	3537	1770	3537	1770	3537
Volume (vph)	430	3	293	8	3	5	514	475	2	7	408	639
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	453	3	308	8	3	5	541	500	2	7	429	673
RTOR Reduction (vph)	0	0	245	0	5	0	0	0	0	0	0	522
Lane Group Flow (vph)	227	229	63	0	11	0	541	502	0	7	429	151
Turn Type	Split	Perm	Split	Prot	Perm	Split	Prot	Perm	Split	Prot	Perm	Split
Protected Phases	4	4	8	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	15.9	15.9	15.9	1.5	27.1	43.1	1.5	17.5	17.5	17.5	17.5	17.5
Effective Green, g (s)	16.4	16.4	16.4	2.0	27.6	43.6	2.0	18.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.20	0.20	0.20	0.02	0.35	0.55	0.02	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	346	325	44	611	1928	44	796	356	345	346	325
v/s Ratio Prot	0.14	c0.14	c0.01	c0.31	0.14	0.00	c0.12	0.10	0.10	0.10	0.10	0.10
v/s Ratio Perm	0.66	0.66	0.19	0.25	0.89	0.26	0.16	0.54	0.43	0.43	0.43	0.43
Uniform Delay, d1	29.2	29.2	26.3	38.3	24.7	9.6	38.2	27.3	26.6	26.6	26.6	26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.29	1.08	4.37	4.37	4.37	4.37
Incremental Delay, d2	4.5	4.7	0.3	3.0	14.4	0.3	1.1	1.7	2.4	2.4	2.4	2.4
Delay (s)	33.7	34.0	26.6	41.3	39.1	10.0	50.3	31.2	118.6	118.6	118.6	118.6
Level of Service	C	C	C	D	A	A	D	C	F	F	F	F
Approach Delay (s)	30.9			41.3	25.1		84.4					
Approach LOS	C			D	C		F					
Intersection Summary												
HCM Average Control Delay	49.1			HCM Level of Service	D							
HCM Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)	16.0							
Intersection Capacity Utilization	81.4%			ICU Level of Service	D							
Analysis Period (min)	15											
c Critical Lane Group												

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak

2008 + Variant H-sub1 (Mitigated)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	0.90
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	1668
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1559	1504	1770	1668	1668
Volume (vph)	50	600	36	202	575	396	64	19	154	526	43	99
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	632	38	213	605	417	67	20	162	554	45	104
RTOR Reduction (vph)	0	0	29	0	0	309	0	63	69	0	59	0
Lane Group Flow (vph)	53	632	9	213	605	108	67	34	16	554	90	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases												
Actuated Green, G (s)	3.3	18.0	18.0	5.5	20.2	20.2	4.4	14.1	14.1	24.4	34.1	
Effective Green, g (s)	3.8	18.5	18.5	6.0	20.7	20.7	4.9	14.6	14.6	24.9	34.6	
Actuated g/C Ratio	0.05	0.23	0.23	0.08	0.26	0.26	0.06	0.18	0.18	0.31	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	818	366	257	916	410	210	285	274	551	721	
v/s Ratio Prot	0.03	c0.18		c0.06	0.17		c0.02	c0.02		c0.31	0.05	
v/s Ratio Perm			0.01		0.07			0.01				
v/c Ratio	0.63	0.77	0.02	0.83	0.66	0.26	0.32	0.12	0.06	1.01	0.12	
Uniform Delay, d1	37.4	28.8	23.8	36.5	26.5	23.6	36.0	27.3	27.0	27.6	13.6	
Progression Factor	1.00	1.00	1.00	0.96	0.51	0.58	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	4.6	0.0	13.3	1.2	0.2	0.9	0.9	0.4	39.7	0.4	
Delay (s)	51.8	33.3	23.8	48.3	14.8	13.8	36.8	28.2	27.4	67.2	14.0	
Level of Service	D	C	C	D	B	B	D	C	C	E	B	
Approach Delay (s)		34.2			20.3			30.2			56.0	
Approach LOS		C			C			C			E	
Intersection Summary												
HCM Average Control Delay		33.2			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		68.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

























PM Peak

2008 + Variant H-sub1 (Mitigated)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.96	0.96	0.96
Satd. Flow (prot)	1770	6408	1583	5085	1583	3433	1504	1504	1748	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.81	0.81	0.81	0.81
Satd. Flow (perm)	1770	6408	1583	5085	1583	2695	1504	1504	1472	1472	1472	1472
Volume (vph)	17	1640	273	0	995	350	536	0	306	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	1726	287	0	1047	368	564	0	322	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	1	1	0	2	0	0
Lane Group Flow (vph)	18	1726	287	0	1047	368	564	160	160	0	16	0
Turn Type	Prot	Free	Free	Free	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	7	4	8	2	2	6	6					
Permitted Phases												
Actuated Green, G (s)	2.2	49.6	80.0	42.9	80.0	21.4	21.4	21.4	21.4	21.4	21.4	21.4
Effective Green, g (s)	2.7	50.1	80.0	43.4	80.0	21.9	21.9	21.9	21.9	21.9	21.9	21.9
Actuated g/C Ratio	0.03	0.63	1.00	0.54	1.00	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	60	4013	1583	2759	1583	738	412	412	403	403	403	403
v/s Ratio Prot	0.01	c0.27		0.21		0.11						
v/s Ratio Perm			0.18		0.23	c0.21		0.11		0.01		
v/c Ratio	0.30	0.43	0.18	0.38	0.23	0.76	0.39	0.39	0.04	0.04	0.04	0.04
Uniform Delay, d1	37.7	7.6	0.0	10.5	0.0	26.7	23.6	23.6	21.3	21.3	21.3	21.3
Progression Factor	1.03	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.2	0.1	0.4	0.3	4.7	0.6	0.6	0.0	0.0	0.0	0.0
Delay (s)	40.4	7.7	0.1	10.9	0.3	31.4	24.2	24.2	21.4	21.4	21.4	21.4
Level of Service	D	A	A	B	A	C	C	C	C	C	C	C
Approach Delay (s)		6.9		8.2		28.8			21.4	21.4	21.4	21.4
Approach LOS		A		A		C			C	C	C	C
Intersection Summary												
HCM Average Control Delay		11.8			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		49.7%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2008 + Variant H-sub1 (Mitigated)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4949		1610	3329	1583	1610	3390	1583
Volume (vph)	270	1147	545	141	781	170	380	286	224	102	230	183
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	1207	574	148	822	179	400	301	236	107	242	193
RTOR Reduction (vph)	0	0	72	0	37	0	0	0	192	0	0	165
Lane Group Flow (vph)	284	1207	502	148	964	0	226	475	44	107	242	28
Turn Type	Prot	pm+ov		Prot			Split	Perm		Split	Perm	
Protected Phases	7	4	2	3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.6	32.6	48.2	7.5	28.5		15.6	15.6	15.6	11.7	11.7	11.7
Effective Green, g (s)	12.1	33.1	49.2	8.0	29.0		16.1	16.1	16.1	12.2	12.2	12.2
Actuated g/C Ratio	0.14	0.39	0.58	0.09	0.34		0.19	0.19	0.19	0.14	0.14	0.14
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	486	1372	986	166	1681		304	628	298	230	484	226
v/s Ratio Prot	0.08	c0.34	0.10	c0.08	0.19		0.14	c0.14		0.07	c0.07	
v/s Ratio Perm			0.22						0.03			0.02
v/c Ratio	0.58	0.88	0.51	0.89	0.57		0.74	0.76	0.15	0.47	0.50	0.12
Uniform Delay, d1	34.3	24.3	10.9	38.3	23.1		32.7	32.8	28.9	33.6	33.8	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	8.3	0.4	40.3	1.4		9.5	5.2	0.2	1.5	0.8	0.2
Delay (s)	36.1	32.6	11.3	78.5	24.6		42.2	38.0	29.2	35.1	34.6	32.2
Level of Service	D	C	B	E	C		D	D	C	D	C	C
Approach Delay (s)		27.2			31.5			36.8			33.8	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay			30.9		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			85.4		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			71.8%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

**CUMULATIVE 2020 + VARIANT H-SUB1
MITIGATED TRAFFIC CONDITIONS
(SYNCHRO)**

4: Wilfred Ave & Langner Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (veh/h)	44	190	130	90	201	32	94	17	127	23	10	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	200	137	95	212	34	99	18	134	24	11	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)				1160								
pX, platoon unblocked												
vC, conflicting volume	245			337			785	796	268	905	831	212
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			337			785	796	268	905	831	212
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			92			63	94	83	87	96	98
cM capacity (veh/h)	1321			1222			270	285	770	186	272	829
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	383	95	212	34	251	53						
Volume Left	46	95	0	0	99	24						
Volume Right	137	0	0	34	134	18						
cSH	1321	1222	1700	1700	415	276						
Volume to Capacity	0.04	0.08	0.12	0.02	0.60	0.19						
Queue Length 95th (ft)	3	6	0	0	96	17						
Control Delay (s)	1.2	8.2	0.0	0.0	26.0	21.1						
Lane LOS	A	A			D	C						
Approach Delay (s)	1.2	2.3			26.0	21.1						
Approach LOS					D	C						
Intersection Summary												
Average Delay		8.6										
Intersection Capacity Utilization		57.7%			ICU Level of Service				B			
Analysis Period (min)		15										

5: Wilfred Ave & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	0.95		1.00	0.95				1.00	1.00		1.00
Frt	1.00	0.97		1.00	0.97				1.00	0.85		0.99
Flt Protected	0.95	1.00		0.95	1.00				0.97	1.00		0.96
Satd. Flow (prot)	1770	3435		1770	3423				1803	1583		1779
Flt Permitted	0.95	1.00		0.95	1.00				0.81	1.00		0.77
Satd. Flow (perm)	1770	3435		1770	3423				1509	1583		1420
Volume (vph)	20	257	63	356	268	75	51	26	604	65	11	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	271	66	375	282	79	54	27	636	68	12	4
RTOR Reduction (vph)	0	27	0	0	38	0	0	0	392	0	2	0
Lane Group Flow (vph)	21	310	0	375	323	0	0	81	244	0	82	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2		6	
Actuated Green, G (s)	2.5	14.8		21.5	33.8			30.2	30.2		30.2	
Effective Green, g (s)	3.0	15.3		22.0	34.3			30.7	30.7		30.7	
Actuated g/C Ratio	0.04	0.19		0.28	0.43			0.38	0.38		0.38	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	66	657		487	1468			579	607		545	
v/s Ratio Prot	0.01	c0.09		c0.21	0.09							
v/s Ratio Perm								0.05	c0.15		0.06	
v/c Ratio	0.32	0.47		0.77	0.22			0.14	0.40		0.15	
Uniform Delay, d1	37.5	28.8		26.7	14.4			16.1	18.0		16.1	
Progression Factor	1.00	1.00		1.30	1.68			1.01	1.11		1.02	
Incremental Delay, d2	2.8	0.5		6.7	0.1			0.5	2.0		0.6	
Delay (s)	40.3	29.3		41.5	24.3			16.7	21.9		17.0	
Level of Service	D	C		D	C			B	C		B	
Approach Delay (s)		29.9			33.0			21.4			17.0	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay		27.3			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		60.9%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

6: Wilfred Avenue & Dowdell Ave
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.97		1.00	0.98			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	3432		1770	3460			1676			1731	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.50	
Satd. Flow (perm)	1770	3432		1770	3460			1545			889	
Volume (vph)	23	722	182	327	555	98	98	67	352	76	15	46
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	760	192	344	584	103	103	71	371	80	16	48
RTOR Reduction (vph)	0	27	0	0	16	0	0	101	0	0	24	0
Lane Group Flow (vph)	24	925	0	344	672	0	0	444	0	0	120	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						2			6			
Actuated Green, G (s)	2.2	24.2		17.5	39.5			24.8			24.8	
Effective Green, g (s)	2.7	24.7		18.0	40.0			25.3			25.3	
Actuated g/C Ratio	0.03	0.31		0.22	0.50			0.32			0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	60	1060		398	1730			489			281	
v/s Ratio Prot	0.01	c0.27		c0.19	0.19							
v/s Ratio Perm								c0.29			0.14	
v/c Ratio	0.40	0.87		0.86	0.39			0.91			0.43	
Uniform Delay, d1	37.9	26.2		29.8	12.4			26.2			21.6	
Progression Factor	0.93	0.95		1.36	1.37			1.00			1.00	
Incremental Delay, d2	3.6	8.4		11.5	0.4			20.4			1.0	
Delay (s)	38.7	33.3		52.0	17.5			46.6			22.7	
Level of Service	D	C		D	B			D			C	
Approach Delay (s)		33.4			29.0			46.6			22.7	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay		33.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		84.9%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

7: Wilfred Avenue & Redwood Drive
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1 (Mitigated)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3390	1441	1770	1863	1583	1770	3539	1583	3433	1703	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3390	1441	1770	1863	1583	1770	3539	1583	3433	1703	
Volume (vph)	77	918	156	235	728	529	184	40	350	553	52	69
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	966	164	247	766	557	194	42	368	582	55	73
RTOR Reduction (vph)	0	0	41	0	0	149	0	0	237	0	32	0
Lane Group Flow (vph)	81	966	123	247	766	408	194	42	131	582	96	0
Turn Type	Prot			Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4			3		8	5		2		6
Permitted Phases				4				8			2	
Actuated Green, G (s)	12.3	67.6	67.6	26.0	81.3	81.3	21.9	17.2	17.2	31.2	26.5	
Effective Green, g (s)	12.8	68.1	68.1	26.5	81.8	81.8	22.4	17.7	17.7	31.7	27.0	
Actuated g/C Ratio	0.08	0.43	0.43	0.17	0.51	0.51	0.14	0.11	0.11	0.20	0.17	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	142	1443	613	293	952	809	248	392	175	680	287	
v/s Ratio Prot	0.05	0.28		c0.14	c0.41		c0.11	0.01		c0.17	0.06	
v/s Ratio Perm			0.09			0.26			0.08			
v/c Ratio	0.57	0.67	0.20	0.84	0.80	0.50	0.78	0.11	0.75	0.86	0.34	
Uniform Delay, d1	70.9	36.9	28.8	64.7	32.5	25.7	66.4	64.0	69.0	61.9	58.6	
Progression Factor	1.05	1.04	1.17	1.05	1.11	1.25	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.6	0.1	14.4	5.2	1.6	14.8	0.1	16.5	10.3	0.7	
Delay (s)	77.3	39.1	34.0	82.6	41.2	33.7	81.2	64.2	85.5	72.3	59.3	
Level of Service	E	D	C	F	D	C	F	E	F	E	E	
Approach Delay (s)		41.0			45.0			82.6			69.9	
Approach LOS		D			D			F			E	
Intersection Summary												
HCM Average Control Delay		53.7			HCM Level of Service			D				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		75.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

10: Wilfred Ave & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak

2020 + Variant H-sub1 (Mitigated)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.95	0.95	0.95	0.95	0.88	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.85	1.00	0.99	1.00	0.95	0.96	1.00	0.95	1.00	0.93	1.00
Satd. Flow (prot)	5085	1583	3433	3518	1681	1694	2787	1770	1723	1770	1723	1723
Flt Permitted	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	5085	1583	3433	3518	1681	1694	2787	1770	1723	1770	1723	1723
Volume (vph)	0	817	842	178	409	17	300	18	571	9	9	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	860	886	187	431	18	316	19	601	9	9	9
RTOR Reduction (vph)	0	0	390	0	3	0	0	0	477	0	7	0
Lane Group Flow (vph)	0	860	496	187	446	0	163	172	124	9	11	0
Turn Type	Prot	pm+ov	Prot	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split
Protected Phases	7	4	2	3	8	2	2	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	17.5	33.5	12.5	34.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Effective Green, g (s)	18.0	34.5	13.0	35.0	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Actuated g/C Ratio	0.22	0.43	0.16	0.44	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1144	683	558	1539	347	349	575	365	355	365	355	355
v/s Ratio Prot	c0.17	c0.15	0.05	c0.13	0.10	0.10	0.04	0.01	c0.01	0.01	c0.01	0.01
v/s Ratio Perm	0.75	0.73	0.34	0.29	0.47	0.49	0.22	0.02	0.03	0.02	0.03	0.03
Uniform Delay, d1	28.9	18.8	29.7	14.5	27.9	28.1	26.4	25.3	25.4	25.3	25.4	25.4
Progression Factor	1.41	5.16	1.21	1.23	0.84	0.84	1.81	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	3.9	0.3	0.4	4.2	4.6	0.8	0.1	0.2	0.1	0.2	0.2
Delay (s)	43.4	101.1	36.2	18.3	27.6	28.0	48.5	25.5	25.5	25.5	25.5	25.5
Level of Service	D	F	D	B	C	C	D	C	C	C	C	C
Approach Delay (s)	72.7			23.5	41.1			25.5				
Approach LOS	E			C	D			C				
Intersection Summary												
HCM Average Control Delay	54.1			HCM Level of Service	D							
HCM Volume to Capacity ratio	0.45											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)	12.0							
Intersection Capacity Utilization	70.5%			ICU Level of Service	C							
Analysis Period (min)	15											
c Critical Lane Group												

12: US-101 NB Ramps & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak

2020 + Variant H-sub1 (Mitigated)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00
Flt Protected	1.00	1.00	0.85	0.96	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1681	1687	1583	1745	1770	3527	1770	3527	1770	3527	1770	3527
Flt Permitted	0.95	0.95	1.00	0.97	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1681	1687	1583	1745	1770	3527	1770	3527	1770	3527	1770	3527
Volume (vph)	396	5	361	15	6	9	557	483	11	9	394	627
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	417	5	380	16	6	9	586	508	12	9	415	660
RTOR Reduction (vph)	0	0	304	0	9	0	0	1	0	0	0	521
Lane Group Flow (vph)	209	213	76	0	22	0	586	519	0	9	415	139
Turn Type	Split	Perm	Split	Perm	Prot	Split	Perm	Split	Perm	Split	Perm	Split
Protected Phases	4	4	8	8	5	2	1	6	6	6	6	6
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4
Actuated Green, G (s)	15.6	15.6	15.6	3.0	27.1	41.9	1.5	16.3	16.3	16.3	16.3	16.3
Effective Green, g (s)	16.1	16.1	16.1	3.5	27.6	42.4	2.0	16.8	16.8	16.8	16.8	16.8
Actuated g/C Ratio	0.20	0.20	0.20	0.04	0.35	0.53	0.02	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	338	340	319	76	611	1869	44	743	332	332	332	332
v/s Ratio Prot	0.12	c0.13	c0.01	c0.01	c0.33	0.15	0.01	c0.12	0.09	0.09	0.09	0.09
v/s Ratio Perm	0.62	0.63	0.24	0.29	0.96	0.28	0.20	0.56	0.42	0.42	0.42	0.42
Uniform Delay, d1	29.1	29.2	26.8	37.1	25.6	10.4	38.2	28.3	27.4	27.4	27.4	27.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.02	3.00	3.00	3.00	3.00
Incremental Delay, d2	3.4	3.6	0.4	2.2	26.2	0.4	1.5	2.0	2.5	2.5	2.5	2.5
Delay (s)	32.5	32.8	27.2	39.2	51.9	10.7	45.0	30.9	84.7	84.7	84.7	84.7
Level of Service	C	C	C	D	B	B	D	C	F	F	F	F
Approach Delay (s)	30.1			39.2	32.5		63.8					
Approach LOS	C			D	C		E					
Intersection Summary												
HCM Average Control Delay	43.1			HCM Level of Service	D							
HCM Volume to Capacity ratio	0.73											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)	16.0							
Intersection Capacity Utilization	83.0%			ICU Level of Service	E							
Analysis Period (min)	15											
c Critical Lane Group												

17: Rohnert Park Expy & Labath Ave
Graton Rancheria Casino & Hotel

PM Peak

2020 + Variant H-sub1 (Mitigated)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	1672
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	1565	1504	1770	1672	1672
Volume (vph)	58	539	45	122	584	347	69	17	123	504	48	104
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	567	47	128	615	365	73	18	129	531	51	109
RTOR Reduction (vph)	0	0	37	0	0	289	0	47	54	0	58	0
Lane Group Flow (vph)	61	567	10	128	615	76	73	31	15	531	102	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases												
Actuated Green, G (s)	4.4	16.1	16.1	4.4	16.1	16.1	4.4	17.1	17.1	24.4	37.1	
Effective Green, g (s)	4.9	16.6	16.6	4.9	16.6	16.6	4.9	17.6	17.6	24.9	37.6	
Actuated g/C Ratio	0.06	0.21	0.21	0.06	0.21	0.21	0.06	0.22	0.22	0.31	0.47	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	108	734	328	210	734	328	210	344	331	551	786	
v/s Ratio Prot	0.03	c0.16	0.04	c0.17	0.04	c0.17	0.04	c0.20	0.02	c0.30	c0.06	
v/s Ratio Perm			0.01			0.05			0.01			
v/c Ratio	0.56	0.77	0.03	0.61	0.84	0.23	0.35	0.09	0.05	0.96	0.13	
Uniform Delay, d1	36.5	29.9	25.3	36.6	30.4	26.4	36.0	24.8	24.6	27.1	12.0	
Progression Factor	1.00	1.00	1.00	0.87	0.52	0.55	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	5.1	0.0	4.0	6.7	0.3	1.0	0.5	0.3	29.2	0.3	
Delay (s)	43.1	35.0	25.3	35.8	22.5	14.9	37.0	25.4	24.8	56.3	12.3	
Level of Service	D	C	C	D	C	B	D	C	C	E	B	
Approach Delay (s)		35.0			21.5			29.1			46.1	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM Average Control Delay		31.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		64.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

20: Rohnert Park Expy & US-101 NB Ramps
Graton Rancheria Casino & Hotel

























PM Peak

2020 + Variant H-sub1 (Mitigated)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.96	0.96
Satd. Flow (prot)	1770	6408	1583	5085	1583	3433	1504	1504	1748	1748	1748	1748
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.75	1.00	1.00	0.80	0.80	0.80	0.80
Satd. Flow (perm)	1770	6408	1583	5085	1583	2695	1504	1504	1457	1457	1457	1457
Volume (vph)	19	1354	504	0	986	343	554	0	376	14	0	3
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1425	531	0	1038	361	583	0	396	15	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	20	20	0	2	0
Lane Group Flow (vph)	20	1425	531	0	1038	361	583	178	178	0	16	0
Turn Type	Prot	Free	Free	Free	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	7	4	8	2	2	6	6					
Permitted Phases												
Actuated Green, G (s)	4.2	48.3	80.0	39.6	80.0	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Effective Green, g (s)	4.7	48.8	80.0	40.1	80.0	23.2	23.2	23.2	23.2	23.2	23.2	23.2
Actuated g/C Ratio	0.06	0.61	1.00	0.50	1.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	3909	1583	2549	1583	782	436	436	423	423	423	423
v/s Ratio Prot	0.01	0.22	c0.20			0.12						
v/s Ratio Perm			c0.34		0.23	c0.22		0.12		0.01		
v/c Ratio	0.19	0.36	0.34	0.41	0.23	0.75	0.41	0.41	0.04	0.04	0.04	0.04
Uniform Delay, d1	35.8	7.8	0.0	12.5	0.0	25.7	22.9	22.9	20.4	20.4	20.4	20.4
Progression Factor	1.26	1.51	1.00	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.3	0.4	0.2	3.9	0.6	0.6	0.0	0.0	0.0	0.0
Delay (s)	45.7	12.0	0.3	10.3	0.2	29.6	23.5	23.5	20.4	20.4	20.4	20.4
Level of Service	D	B	A	B	A	C	C	C	C	C	C	C
Approach Delay (s)		9.2		7.7		27.1			20.4	20.4	20.4	20.4
Approach LOS		A		A		C			C	C	C	C
Intersection Summary												
HCM Average Control Delay		12.8			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		48.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

21: Rohnert Park Expy & Commerce Boulevard
Graton Rancheria Casino & Hotel

PM Peak
2020 + Variant H-sub1 (Mitigated)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91		0.91	0.91	1.00	0.91	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	4888		1610	3339	1583	1610	3380	1583
Volume (vph)	269	929	547	195	766	268	390	348	317	180	313	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	283	978	576	205	806	282	411	366	334	189	329	182
RTOR Reduction (vph)	0	0	364	0	75	0	0	0	267	0	0	150
Lane Group Flow (vph)	283	978	212	205	1013	0	250	527	67	167	351	32
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	8.5	21.7	21.7	11.2	24.4		15.6	15.6	15.6	13.5	13.5	13.5
Effective Green, g (s)	9.0	22.2	22.2	11.7	24.9		16.1	16.1	16.1	14.0	14.0	14.0
Actuated g/C Ratio	0.11	0.28	0.28	0.15	0.31		0.20	0.20	0.20	0.18	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	982	439	259	1521		324	672	319	282	592	277
v/s Ratio Prot	0.08	c0.28		c0.12	0.21		0.16	c0.16		0.10	c0.10	
v/s Ratio Perm			0.13						0.04			0.02
v/c Ratio	0.73	1.00	0.48	0.79	0.67		0.77	0.78	0.21	0.59	0.59	0.11
Uniform Delay, d1	34.3	28.9	24.1	33.0	23.9		30.2	30.3	26.7	30.4	30.4	27.8
Progression Factor	0.65	0.61	1.01	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	26.9	3.6	15.1	2.3		10.8	6.0	0.3	3.3	1.6	0.2
Delay (s)	29.0	44.4	28.0	48.1	26.3		41.0	36.3	27.0	33.7	32.0	28.0
Level of Service	C	D	C	D	C		D	C	C	C	C	C
Approach Delay (s)		36.9			29.7			34.6			31.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM Average Control Delay			33.7		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			73.0%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

ATTACHMENT 5

Responses to Public Comments on FEIS

CHAPTER 1.0

COMMENTS

Commenters that submitted written comments on the Final EIS are listed in **Table 1**. During the FEIS waiting period of total of 19 letters were received. These comment letters have been bracketed into individual comments and assigned a number (see **Chapter 2.0**). **Chapter 3.0** contains responses to substantial environmental concerns raised during the waiting period.

TABLE 1
LIST OF COMMENTERS

Letter	Individual or Signatory	Affiliation	Address	Date
Government Agencies				
G-1	Paul L. Kelley, Chair	Sonoma County Board of Supervisors	575 Administration Drive, Room 100A, Santa Rosa, CA, 95403	3/30/2009
G-2	Kathleen M. Goforth	U.S. Environmental Protection Agency-Region IX	75 Hawthorne Street, San Francisco, CA 94105-3901	3/26/2009
G-3	Michael Ban	City of Petaluma- Water Resources and Conservation Department	202 North McDowell Blvd., Petaluma, CA 94952	3/24/2009
G-4	Katy Sanchez	Native American Heritage Commission	915 Capital Mall, Room 364, Sacramento, CA 95814	3/10/2009
G-5	Mike Moore	City of Petaluma- Community Development	11 English Street, Petaluma, CA 94952	3/26/2009
G-6	Lisa Carboni	California Department of Transportation	111 Grand Avenue, P.O. Box 23660, Oakland, CA 94623-0660	3/19/2009
G-7	Andrea Hoch	California Office of the Governor- Legal Affairs Secretary	Governor's Office- State Capital (Attention: Legal Affairs Secretary) Sacramento, CA 95814	5/01/2006
G-8	Pamela Torliatt	City of Petaluma	P.O. Box 61, Petaluma, CA 94953-0061	4/01/2009
G-9	Douglas A. Williams	Rincon Valley Fire Protection District	8200 Old Redwood Highway, P.O. Box 530, Windsor, CA 95492	3/10/2009
G-10	Terry Roberts	California Governor's Office of Planning and Research	1400 10 th Street, P.O. Box 3044, Sacramento, CA 95812-3044	5/7/2009
G-11	Kathleen M. Goforth	U.S. Environmental Protection Agency-Region IX	75 Hawthorne Street, San Francisco, CA 94105-3901	5/27/2009
G-12	Jared Huffman	Assemblymember, California Legislature	3501 Civic Center Drive, Suite 412, San Rafael, CA 94903	6/15/2009
Business and Non-Governmental Agencies				
B-1	Chip Worthington	Stop the Casino 101	4695 Snyder Lane, Rohnert Park, CA 94928	3/24/2009
B-2	Alan Titus	Robb & Ross	591 Redwood Highway, Suite 2250, Mill Valley, CA 94941	3/26/2009
B-3	David Grundman	Reclaiming Our Environmental Rights	6715 Dexter Circle, Rohnert Park, CA 94928	3/26/2009
B-4	Chip Worthington	Stop the Casino 101	4695 Snyder Lane, Rohnert	3/20/2009

Letter	Individual or Signatory	Affiliation	Address	Date
			Park, CA 94928	
B-5	Marilee Montgomery	Stop the Casino 101	152 Wilfred Avenue, Santa Rosa, CA 95407	4/21/2009
B-6	Marilee Montgomery	Stop the Casino 101	152 Wilfred Avenue, Santa Rosa, CA 95407	5/07/2009
Individuals				
I-1	Paul D. Stutrud		P.O. Box 2205, Rohnert Park, CA 94927	2/25/2009
I-2	Eunice Edgington		990 Echo Court, Rohnert Park, CA 94928	3/06/2009
I-3	Marilee Montgomery		152 Wilfred Avenue, Santa Rosa, CA 95407	3/11/2009
I-4	Dan Monte		33 Jefferson Avenue, San Rafael, CA 94903	3/27/2009
I-5	Linda M Long		944 Helene Court, Rohnert Park, CA 94928	3/20/2009

CHAPTER 2.0

COMMENT LETTERS

- **GOVERNMENT AGENCY LETTERS**
- **BUSINESS AND NON-GOVERNMENT AGENCY LETTERS**
- **INDIVIDUAL LETTERS**

Government Agency Letters

COUNTY OF SONOMA
BOARD OF SUPERVISORS
575 ADMINISTRATION DRIVE, RM. 100A
SANTA ROSA, CALIFORNIA 95403
(707) 565-2241
FAX (707) 565-3778



Comment Letter G-1

MEMBERS OF THE BOARD

PAUL L. KELLEY
CHAIR

VALERIE BROWN
VICE CHAIR

MIKE KERNS

SHIRLEE ZANE

EFREN CARRILLO

March 30, 2009

Mr. Brad Mehaffy
NEPA Compliance Officer
National Indian Gaming Commission
1441 L Street, NW, Suite 9100
Washington, D.C. 20005

Dear Mr. Mehaffy:

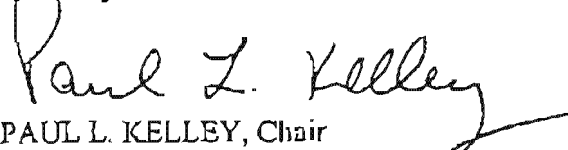
At its meeting of March 24, 2009, the Sonoma County Board of Supervisors and Board of Directors of the Sonoma County Water Agency formally approved the attached comments on the Final Environmental Impacts Statement ("FEIS") for the Federated Indians of Graton Rancheria Casino and Hotel Project ("proposed project"). Please include these comments in any Record of Decision for the proposed project.

The attached comments are intended to identify those areas in which the FEIS remains deficient and out of compliance with the National Environmental Policy Act ("NEPA"). Among other issues, the FEIS includes incorrect background information, including about the County General Plan; fails to analyze the impacts of necessary project components, including the widening of Wilfred Avenue west of the project site; and fails to properly mitigate the project's significant adverse impacts related to flooding and drainage, problem and pathological gamblers, and other resources.

The County hereby requests that the FEIS be revised to better address these issues. The County appreciates the efforts to date of the NIGC, EIS preparers, and the Tribe, and we remain committed to working with all parties to ensure that all impacts and alternatives are disclosed, analyzed, and fully mitigated before project approval.

Thank you in advance for your consideration of the County's comments. If you have questions or require additional information, please contact Jeffrey Brax, Deputy County Counsel, at (707) 565-2421.

Sincerely,


PAUL L. KELLEY, Chair
Sonoma County Board of Supervisors
Sonoma County Water Agency

G-1.1

County of Sonoma and Sonoma County Water Agency

Comments on the Graton Rancheria Casino and Hotel Project Final Environmental Impact Statement (FEIS)

The following comprises the comments of the County of Sonoma and Sonoma County Water Agency (collectively "County") on the FEIS for the Graton Rancheria Casino and Hotel Project (proposed project). We acknowledge and appreciate the changes that were made to the Draft EIS, and to the Preliminary Final EIS (PFEIS), in response to our suggestions and the comments of others. We also appreciate the courtesy and cooperation of the both the National Indian Gaming Commission and the EIS preparers in providing copies of the document and information about issuance of the Record of Decision (ROD).

As detailed below, we believe the FEIS does not appropriately respond to several important comments on the Draft EIS, and does not meet the National Environmental Policy Act requirement that it take a "hard look" at the project's impacts and mitigate them to a less-than-significant level. We respectfully request that the NIGC direct the revision of the FEIS as outlined below, and circulate the revised document for public review.

G-1.1
cont.

If the NIGC instead proceeds with the ROD, we hereby reiterate our agreement with the United States Environmental Protection Agency that the NIGC should approve Alternative H, the reduced intensity project, rather than Alternative A.

I. Traffic

A. Local Roads

1. Wilfred Avenue

The County has consistently and repeatedly commented that any project alternative located on Wilfred Avenue would create significant adverse traffic safety and capacity impacts on the roadway. As the FEIS acknowledges at p. 3.8-1, Wilfred Avenue is a rural two-lane roadway with open roadside ditches and no shoulders. It cannot safely accommodate any substantial increase in traffic without widening to three lanes from Stony Point Rd. to the Urban Growth Boundary (UGB).

G-1.2

The FEIS includes several project alternatives located on Wilfred Ave, including Alternative C, which is adjacent to Alternative A—immediately west of Langer Ave instead of immediately east. The FEIR correctly acknowledges that these alternatives would result in significant adverse impacts on Wilfred Avenue, and requires widening to three lanes from Stony Point Rd. to the UGB. (Pp. 5-38 and 42, fn. 4.)

The PFEIS incorrectly omitted a similar requirement for Alternative A, despite its location and generation of substantial traffic on Wilfred Ave. In conversations with the County, the EIS preparers stated that this was an inadvertent omission, and would be corrected in the FEIS. The error has not been corrected, however. The FEIS continues to require widening only for Alternatives B and C. (Pp. 5-38 and 42, fn. 4.)

This is a significant omission and, if not corrected, renders the FEIS deficient as a matter of law. The FEIS concedes that Alternative A would generate 18,261 new vehicle trips per day (p. 4.8-19), 15 percent of which would enter and 12 percent would exit using the County portion of Wilfred Avenue (Figures 4.8-4 and -5.) Those figures are likely understated, but even if accurate, they reveal that Alternative A would generate more than 4,930 new vehicle trips every day on a rural two-lane roadway with open roadside ditches and no shoulders. Wilfred Avenue cannot safely accommodate 4,930 new, daily vehicle trips without widening to three lanes with full 12' width lanes and full 8' width shoulders with turn lanes for intersecting roads. There is no legitimate basis for treating Alternative A differently than the immediately-adjacent Alternative C, or for declining to require widening of Wilfred Avenue from the project site to Stony Point Rd.

G-1.2
cont.

On p. 5-65, the FEIS states that if Wilfred Avenue is not widened to increase capacity, "it is recommended that" the Tribe pay a contribution to potential future roadway improvements. This measure is inadequate. No significant development is slated west of the project site, and the County has no plans to widen Wilfred Avenue. The proposed project alone would generate at least 4,930 new trips every day, from the first day it opens. A "recommended" fair share would not reduce the project's adverse traffic capacity and safety impacts to a less than significant level.

2. Langner Avenue and Labath Avenue South of Wilfred Avenue

As the County has previously commented, the FEIS requires only funding of the restructuring of these roads subsequent to project construction, and does not require any roadway improvements (such as widening) to mitigate traffic safety and capacity impacts resulting from project operation. As with Wilfred Avenue, these avenues are rural, two-

G-1.3

lane roadways with open roadside ditches and no shoulders. They cannot accommodate project construction, much less operations, without substantial improvement.

G-1.3
cont.

The FEIS should also identify whether these roads would remain in public ownership after the project opens, or whether the Tribe would petition the County to relinquish these roads from public ownership.

3. Roads North of Wilfred Ave (Millbrae Ave and its connectors to Wilfred Ave)

As the County has previously commented, the FEIS requires only a fair share of a future traffic signal at the Stony Point/Millbrae intersection, and requires no measures to mitigate the project's operational traffic safety and capacity impacts on the roadways themselves. The County has consistently advised that project traffic will undoubtedly find its way onto those roads, which exhibit a variety of non-standard roadway features, including fragile pavement structure. Traffic safety concerns are exacerbated since project traffic would typically be non-local and typically unfamiliar with the roads' deficient conditions. The potential for project traffic to use these roads also would increase if the Tribe does not widen Wilfred Ave between Stony Point Rd to the UGB.

G-1.4

B. Highway 101

The FEIS continues to misstate the relevant threshold of significance. At page 3.8-7, the FEIS states that Level of Service (LOS) E is acceptable to Caltrans. In fact, Caltrans does not allow LOS D or lower to be made worse by development-generated traffic. Current LOS D or less must be maintained at present levels.

The failure to apply the actual threshold of significance is a fundamental problem that must be corrected before issuance of the ROD. The FEIS should be revised to disclose the correct threshold and mitigate traffic conditions that would fall below it upon project implementation.

G-1.5

The FEIS also continues to improperly rely on funding of the Hwy 101/Wilfred Avenue and other HOV projects as mitigation. As the County has repeatedly commented, those projects were developed to address existing conditions and planned growth in the region without the project. Indeed, the FEIS acknowledges at Table 4.8-1 that Hwy 101 operates already unacceptably in 2008 at LOS E. Caltrans did not account for additional project-generated traffic in performing modeling and operational analysis for the any of the Hwy 101 HOV projects. As a result, contributing to the HOV projects would not mitigate the project's significant traffic impacts.

It is especially inappropriate to claim credit for funding the Wilfred Project. The Wilfred Project has already been awarded and will start construction in spring of 2009. No further funding is necessary, and the FEIS should not claim to the contrary, much less pretend that a monetary contribution would mitigate the project's significant traffic impacts.

Instead, the FEIS should recognize that the project would add the equivalent of one entire traffic lane of volume to the entire Hwy 101 corridor from Rohnert Park southbound. The FEIS should disclose that the project would generate close to 1600 vph during peak traffic times, which Caltrans uses a LOS C volume for freeway segments.

The FEIS should be revised to discuss the actual measure that would be necessary to mitigate the project—the addition of another full lane to the entire Hwy 101 corridor south of Rohnert Park. If this measure is infeasible because of physical or economic constraints, the FEIS should pragmatically address the project's significant short- and long-term impacts to provide at least some positive traffic congestion relief. Specifically, the Central B Project HOV Project (Pepper Road to Old Redwood Hwy) will be 100% designed by late 2009, but is funded only through design. The funding shortfall for construction is approximately \$32 million.

G-1.5
cont.

The FEIS states that the Tribe "support(s) efforts related to the completion of the project (Wilfred Avenue to Old Redwood Hwy HOV projects) in a timely fashion (2008)." As a result, the FEIS should require the Tribe to contribute the entire cost of construction for the last remaining segment (Central B) of HOV lanes between Wilfred Avenue and Old Redwood Hwy as its fair share to all of the projects it counts as its mitigation. The \$32 million cost identified above is approximately the cost of one freeway lane of traffic between Wilfred Ave and Old Redwood Hwy—i.e. the cost to mitigate the increased freeway traffic generated by the project alone.

It would also be appropriate to require the Tribe to fund SCTA's administrative effort to seek and program funds for the completion of other HOV projects south of the project site, since 69% of project traffic would come from south of Rohnert Park. In particular, a "proportional share" for the Hwy 101 Marin-Sonoma Narrows (MSN) projects currently under design appears warranted, since the project would impact this portion of Hwy 101.

The FEIS should also be revised to identify the methodology to be used to calculate the Tribe's contribution to roadway improvements contemplated on page 5-37. For state highways, Caltrans uses the Method For Calculating Equitable Mitigation

Measures" outlined in the "Guide For The Preparation Of Traffic Impact Studies." The formulas should be used when "a project has impacts that do not immediately warrant mitigation, but their cumulative effects are significant and will require mitigating in the future," and when "[a] project has an immediate impact and the lead agency has assumed responsibility for addressing the improvements."

G-1.5
cont.

The FEIS should also be revised to disclose whether the establishment of escrow accounts for project contributions would apply to Caltrans or SCTA as well as the County for both 2008 and 2020 mitigation.

C. Timing of Roadway Improvements.

As the County has previously commented, all identified full-share road improvements should be constructed by the Tribe instead of simply being funded, as the FEIR indicates (2nd paragraph of Section 5.2.7, Mitigation for Intersections). The County's standard practice in conditioning all other development projects requires the developer to construct road improvements necessary to mitigate project impacts. This developer should not be treated differently. Nor should the County be expected to incur the administrative and organizational burden of designing and constructing such developer-driven road improvements.

G-1.6

In addition, all full-share improvements listed must be constructed prior to project occupancy/operation start-up. This is necessary to ensure timely mitigation of the project's significant traffic safety and capacity impacts.

D. Construction Traffic.

In Appendix FF Section 2.11.13, Construction Impacts response, page 291, the FEIS seems to present the specious argument that the County and other public agencies have the responsibility to ensure that their roads have the structural ability to withstand traffic loads commensurate with road classifications. It would follow, then, that the FEIS intends to assess the project's construction traffic impacts relative to that idealized condition. In fact, the County's road classifications represent only the roads' actual use, independent of whether they have been engineered and constructed to a particular standard. A case in point is Wilfred Avenue. The FEIS should therefore recognize that the project's construction traffic impacts on the structural integrity of any affected roads must be analyzed and mitigated in direct response to the reasonably predicted and (ultimately) actual damage to the road given its existing condition.

G-1.7

The County has previously commented that the massive importation of fill required to construct the proposed project would destroy Wilfred Avenue and significantly impact other County roads. In previous conversations, the EIR preparers indicated they were willing to prohibit the use of County roads to import fill, and to specify exact routes for other construction traffic.

These measures do not appear to have been incorporated into the FEIS. Instead, the FEIS states that County roads will be used "whenever necessary." This remains inappropriate. Wilfred Avenue in particular could not stand up to haul truck traffic and would need repeated and timely maintenance to provide on-going serviceability of the pavement, including but not limited to pothole patching, repair of distorted areas, and additional paving to maintain smoothness. The FEIS offers third party review of the pavement condition upon completion of the haul operation, but does not allow County approval of the consultant and does not specify the methodology to be used in assessing the degree of the final pavement mitigation. Absent further analysis and mitigation, the FEIS fails to meet its NEPA duty of taking a "hard look" at construction traffic impacts.

G-1.7
cont.

Page 5-64 states that lane closures are to be off-peak "when feasible." In fact, lane closures must be prohibited for traffic congestion and safety reasons, and exceptions allowed only at the sole discretion of the County.

Page 5-65 states that importation of construction material shall be scheduled outside area-wide commute peak hours. In fact, the fill is scheduled for 10-hour days, 6 days a week, for several months (page 4.8-16). It is impossible to meet this schedule and still avoid commute hours. The County has previously identified this issue, but the EIS preparers have not addressed it.

E. Specific Comments

Page 3.8-6 should be revised to refer to SCT (Sonoma County Transit) and delete the word "Authority." The FEIS also should be revised to update its information regarding the Sonoma Marin Area Rail Transit project. Measure Q passed in the November 2008 election with 68.5% of the vote, raising the sales tax by one quarter percent to pay for construction and operations of the project.

G-1.8

Page 3.8-8 should be revised to clarify that the Rohnert Park Expressway (RPX) SB ramp has been completed and in service for at least two years.

As the County has previously commented, Section 5.0 of the FEIS should be revised to clearly identify operational traffic impact mitigations for the various impacted

road segments. The FEIS contains a footnoted reference to the Wilfred Avenue segment (Table 5.7, Intersection Improvements) but no other segment improvements are noted. Cases in point include Langner and Labath Avenues.

Page 5-58 conditions the Tribe's proportional share contribution for the HOV projects between Wilfred Avenue and Old Redwood Hwy to "remaining costs (if any)." The FEIS thus appears to use state and local tax measure funding as mitigation for the project's significant LOS impacts to the Hwy 101 corridor. This is inappropriate. As discussed above, Caltrans did not account for project-generated traffic in its traffic operational analyses for the HOV projects. The HOV projects do not mitigate the project's traffic impact.

G-1.8
cont.

On page 5-61, Table 5-12 does not include a column for Alt. A Mitigated 2008 LOS.

II. Law Enforcement

Similar to previous versions of the document, the FEIS fails to take a "hard look" at the project's impacts on law enforcement. The FEIS fails to present a detailed analysis of fiscal impacts, and instead repeatedly states that the Tribe will negotiate an agreement to compensate the County. This is entirely inappropriate. As the County has repeatedly commented, the sole purpose of an FEIS is to disclose, analyze, and mitigate impacts before project approval. Relying on a deferred negotiation is an inadequate substitute that does nothing to fill in the FEIS's analytical and mitigation gaps.

The FEIS also fails to adequately respond to the County's previous comments regarding the annual payments necessary to mitigate general law enforcement impacts, detention and justice services, and County-wide special services including SWAT, Bomb, and Helicopter units. The FEIS argues only that since the latter were included in the overall County budget, they were already factored into the funding level proposed to mitigate fiscal impacts. This claim is insufficient to fully disclose and analyze the fiscal impacts to the Sheriff's Department.

G-1.9

In response to previous County comments, the FEIS has updated its references to jurisdictional authority. The FEIS now correctly states that assuming no agreements to the contrary between the Sheriff's Department and another agency, the Sheriff's Department would be the primary law enforcement service provider unless the project site is annexed by Rohnert Park. The FEIS should be further revised to actually analyze

the likelihood of such annexation, and the ways in which it would alter the provision of public services to the project.

G-1.9
cont.

Finally, the FEIS states that Creekside Middle School is served by Rohnert Park via a contract. In fact, the school was annexed by Rohnert Park in late 2006 or early 2007, and the City is directly responsible for providing services.

III. Fire and Emergency Services

Although the FEIS offers proposed mitigations for the primary fire department responder, it fails to address the impacts that will be realized by other jurisdictions serving the area. An assessment of these service area impacts, with corresponding mitigations, requires the completion of a "Standards of Cover for Emergency Response" analysis consistent with a nationally recognized standard.

The analysis needs to emphasize the delivery of an effective firefighting force, with specific attention to the impacts upon regional resource draw down (especially in the Hwy 101 corridor) and the need to dynamically relocate resources as incidents occur. The analysis should include a remedy to the financial impacts associated with increased service delivery.

Absent this analysis, the FEIS fails to meet NEPA standards. It is not sufficient merely to state that the provider of primary services could be the Rohnert Park Department of Public Safety, and that the Tribe would enter an agreement that "could consider mutual aid services." Such statements fail to analyze and ensure mitigation of the project's direct impacts on fire services, much less its significant cumulative effects on regional fire services providers.

G-1.10

The FEIS also should be revised to update its information regarding the Sutter-Memorial Hospital transaction. In January 2007, Sutter Medical Center of Santa Rosa (SMCSR) and Santa Rosa Memorial Hospital (Memorial) announced they signed a letter of intent that included the transfer of certain HCAA obligations from SMCSR to Memorial. In March 2008, SMCSR and Memorial announced the termination of their negotiations. SMCSR is proposing a revised Business Plan to present to the Board of Supervisors to allow SMCSR to more efficiently comply with its HCAA obligations through 2021. SMCSR has indicated that the proposed revised Business Plan will include construction of a 70 bed hospital at the Wells Fargo Center for the Arts site. The hospital will include an ER, ICU, Medical/Surgical, Labor & Delivery, a Neonatal

Intensive Care Unit, and SMCSR will continue to serve the County's uninsured and underinsured through 2021.

G-1.10
cont.

SMCSR's proposed plan may be viewed on the County's website at www.sonoma-county.org/county-sutter-proposal. Additional information is available at www.sonomacounty.org/health/admin/pdf/press_release_sutter_submits_proposed_plan_to_county_11_20_08.pdf.

IV. Socioeconomics and Health Services

A. Problem and Pathological Gambling

The FEIS errs by relying on information 11 years out of date, including outdated findings from the California Council on Problem Gambling (CCPG). The CCPG has made more recent findings regarding the need for formal intensive treatment, help lines, and public awareness and prevention campaigns targeting the public, gamblers, and casino employees. The CCPG also recommends youth education to address underage gambling utilizing web based resources, measures to prevent youth gambling-related health problems, and programs to protect vulnerable and at risk youth. The FEIS proposes inadequate funding to address these and other prevention and treatment options for Sonoma County residents.

The FEIS also fails to address increased prevalence among adolescents, older adults, ethnic and cultural, and other groups. The scientific literature, including the study attached hereto as Exhibit A, identifies a 13.3 percent prevalence rate for problem and pathological gambling by adolescents, and that men, the young, and those with concurrent substance abuse or mental illness are at greater risk of a gambling-related problem. (Exh. A at 62-63.) The FEIS should revise its estimates of new problem and pathological gamblers to identify these special populations, and require targeted treatment to mitigate impacts.

G-1.11

In addition, the FEIS errs by proposing funding calculation for treatment limited to problem and pathological gamblers who seek help. The FEIS proposes minimal to no public awareness and education campaign, which would serve to skew funding formulas by generating artificially low projections of gamblers needing problem and pathological gambling treatment services. Artificially reducing the number of problem and pathological gamblers affected by the project would in turn generate insufficient mitigation funding for prevention, education and treatment capacity.

The FEIS should be revised to include a neutral and frank evaluation of the project's potentially significant socioeconomic and related impacts, including its obvious community risk for developing problem and pathological gambling. The scientific literature notes that lower-income households spend proportionately more on gaming activities than higher-income households, and that gaming projects impose great costs to families in terms of dysfunctional relationships, violence and abuse, financial pressure, and disruption of growth and development of children. (Exh. A at 63.)

The FEIS should be revised to require mitigation including but not limited to:

- Requiring a determination of baseline gambling impact indicators and their current levels prior to opening. Participation in the Healthy Sonoma website to track community health impacts associated with the project.
- Incorporation of known successful employee training programs, including those listed in the American Gaming Association's 2004 publications listing casino properties in 14 states that participate in successful education programs about responsible gaming.
- Incorporation of problem gambling and domestic violence prevention education to be distributed through a community education media campaign including Healthy Sonoma website resources.
- Requiring ongoing tracking and monitoring for changes in indicators to inform the community Tribe, cities and County.
- Requiring funding for intervention and action when indicators/statistics move in the wrong direction.
- Requiring true-up of projected impacts with actual findings (data/statistics) over agreed upon timeframes.
- Periodic analysis of indicator changes and application of emerging CCPG research findings.

G-1.12

B. Child Abuse and Neglect and Relationship to Domestic Violence

The County has previously commented that the EIS did not include adequate mitigation for the significant project impacts of child abuse and neglect and domestic violence.

G-1.13

The FEIS has revised Section 5.2.6 to include a statement that the Tribe shall train employees to recognize domestic violence and sexual assault situations, display domestic violence hotline numbers, and work with local agencies in domestic violence and sexual assault situations. But the FEIS has not been revised to include any mitigation addressing child abuse and neglect. Appendix FF instead states that "Appendix N indicates that casino impact researchers did not find a remarkable relationship between casinos and child abuse."

That statement is false. Information from the Department of Health and Human Services indicates that 53% of men involved in domestic violence also abuse their children. Since the FEIS correctly recognizes the nexus between casino operations and domestic violence, it should also recognize the secondary nexus with child abuse and neglect.

The FEIS should be revised to mitigate project impacts by requiring the Tribe, at a minimum, to train employees to recognize child abuse situations and respective reporting requirements, display the appropriate hotline number, and work with local agencies in child abuse prevention.

C. Substance Abuse

G-1.13
cont.

The FEIS correctly notes in Appendix N that casinos generate a universal demand for substance abuse assistance from affected social service departments. But the FEIS does not yet provide adequate mitigation for the project's increased demand for treatment. Access to treatment on demand for substance abuse is for the most part not available in Sonoma County. Currently there is insufficient capacity to absorb increased treatment on demand for services in the community without new funding. The FEIS should be revised to require the Tribe to work with local entities and fund treatment on demand for substance abuse, addiction and problem gambling.

D. Access by Vulnerable Adults

The County has previously commented that the EIS should require the Tribe to adopt measures to limit access to vulnerable adults. The FEIS does not appear to respond to this comment, either in Appendix FF or Section 5.2.6. At a minimum, the FEIS should be revised to require the Tribe to train employees to recognize mental health issues and elder abuse situations, understand the relevant reporting requirements, display the appropriate hotline number, and work with local agencies to limit and prevent impacts.

E. Public Assistance Costs

The County previously commented that the EIS should use the full cost of public assistance in calculating annual service costs for the new service population, and not just the County share. The figures remain unchanged in the FEIS; there is no reference or response in the document explaining why it was not changed.

F. Drug Arrests and Diversion

The FEIS cites Special Enforcement Unit (SEU) funding for enforcement efforts against gangs, drugs, and repeat offenders, but fails to address costs born by the County for diversion into treatment, particularly for repeat offenders with addiction disorders. The FEIS acknowledges that the project would result in a 95% increase in drug arrests, but fails to include adequate funding to address the resulting demand for diversion into substance abuse treatment.

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cont.

G. Indoor Air Quality

The FEIS proposes to mitigate indoor air quality impacts simply by providing optional segregation of smokers from non-smokers. This measure fails to address significant health risks associated with the project. The Surgeon General's June 2006 report on the issue found that there is no safe level of exposure to secondhand smoke, and the California Air Resources Board and CalEPA have labeled secondhand smoke as a Class A carcinogen. The EIS fails to protect public health in the proposed mitigation. The FEIS states "The Tribe shall ensure that comfort levels are acceptable to most occupants..." and ignores the impact of second hand smoke on patrons and employees including those who may be pregnant or living with breathing disorders.

G-1.14

The EIS mitigation should be revised to require that the project be developed, advertised, and promoted as a "smoke-free" environment, and prohibit the sale and use of tobacco products throughout the project footprint. Smoke-free tribal casinos exist in both California (Lucky Bear in Hoopa) and New Mexico, and smoke-free non-tribal casinos exist throughout the country. Smoke-free casinos report few difficulties with enforcement and document significant economic, health and safety benefits related to reduced rates of employee illness and absenteeism, lower cleaning and maintenance costs, and reduced insurance costs due to decreased fire risk.

Implementation of this policy would entirely prevent exposure to secondhand smoke. Costs would be negligible and, in fact, significant savings would be achieved

through the reduced rates of employee illness, reduced cleaning and maintenance costs, and reduced fire risk.

G-1.14
cont.

H. Mitigation Measures

Measure F on page 5-33 should be revised to require, at a minimum, that the results of customer surveys be made available to city and County as well as state and federal officials.

Measures Q, U, and V on pages 5-68 and -69 state that employees will be trained to identify intoxicated and underage drinkers, but they do not require policies to limit or prevent patrons from becoming intoxicated in the first place. The FEIS should be revised to require policies addressing drink counting and pricing, serving sizes, and food service.

Measure W on page 5-69 should be revised to specify that the internal monitoring program would support enforcement of the Tribe's zero tolerance for underage drinking and parties involving minors.

G-1.15

Measure X on page 5-69 should be revised to specifically direct that on-site security work with law enforcement to prevent sexual assault, human trafficking and prostitution by reporting known registered sex offenders/predators. The measure should also require the Tribe to train employees in human trafficking recognition and partner with cities and the County in anti-human trafficking efforts.

Measure Y on page 5-69 should be revised to require the Tribe to collaborate with law enforcement by warning intoxicated patrons not to drive and dialing 911 to report drunk drivers.

V. Land Use, Agriculture, and Growth

A. General Plan 2020

The FEIS requires an overhaul to update its analysis of the project's consistency with the Sonoma County General Plan. In September 2008, the Board of Supervisors adopted the GP2020 update, which changed many of the goals, objectives, and policies of the General Plan. Among other changes, GP2020 includes a new Water Resources Element with many new policies on water quality, groundwater and public water systems; combines the Open Space and Resource Conservation Elements; designates more Biotic Habitat Areas and Riparian Corridors; and adds new policies in all elements. The FEIS should be revised to revise obsolete references, address the project's

G-1.16

consistency with new and revised policies, and impose mitigation measures to address significant inconsistencies and project impacts.

Among other changes, Table 4.8.3 should be revised as follows to reflect the current policy language in the Sonoma County General Plan:

- Change Policy LU-3c to read: " Policy LU-3c: Avoid urban sprawl by limiting extension of sewer or water services outside of designated Urban Service Areas pursuant to the policies of the Public Facilities and Services Element."
- Either following Policy LU-3 or under a separate heading for "Public Facilities and Services Element," add summary of Policy PF-if to read: "Avoid extension of public sewer services outside of either a sphere of influence adopted by LAFCO or the Urban Service Area, except to resolve a public health hazard resulting from existing development, where a substantial overriding public benefit would result, or to allow an affordable housing project adjoining an urban service boundary. "
- Change reference from LU-5c to 5c & b.
- Change reference from Goal LU-8 to LU-9.
- Change reference from Objective LU-8.1 to Objective LU-9.1.
- Change reference from Objective LU-8.2 to Objective 9.2.
- Change reference from Goal LU-9 to Goal LU-10.
- Change reference from Open Space Element to Open Space and Resource Conservation Element and change all policy and figure references from "OS" to "OSRC."
- Change reference from OS-1b to OSRC-1b & d.

G-1.16
cont.

B. Land Use

The County previously commented that Section 2.13.2 incorrectly stated that "any development planned within the designated sphere of influence would be subject to approval by the City, while development outside of the sphere of influence would be subject to approval by Sonoma County." In fact, regardless of any sphere of influence,

any development proposed on non-trust land outside City limits is subject to County approval. Development is subject solely to City approval only after annexation of the relevant parcel.

The FEIS continues to be in error. The relevant sentence on page 335 should be revised to read: "This important because any development planned within the designated sphere of influence would be subject to review and comment by the City but would not be subject to approval by the City until annexation took place, while development outside of the sphere of influence would be subject to approval by Sonoma County."

The FEIS also should revise response 2.13.11, which incorrectly claims that the site's future trust status renders it consistent with General Plan goals regarding intense development in the designated community separator. This claim is unavailing. Regardless of who owns the project site, the proposed project site is inconsistent with the General Plan, a significant impact.

The response also falsely states that "the appearance of the proposed development would be consistent with the commercial activities" to the east and is therefore consistent with a General Plan goal. In fact, the proposed project would be 10 stories, much taller than allowed by either the City or the County in the vicinity. The project's appearance would not be remotely consistent with the commercial activities to the east.

G-1.16
cont.

The FEIS also should revise response 2.22.11, which incorrectly states that the project is consistent with Goals LU-5 and OS-1, which address the community separator open space designation. The project would not be consistent with these goals unless and until the City of Rohnert Park annexes the site. Since the FEIS does not propose annexation, the project lies outside of the City on lands that are designated for open space and agriculture and is not consistent with the County General Plan.

C. Agriculture

The FEIS should revise Appendix FF response 2.20.4, which incorrectly claims that soil quality is the only relevant measure of a site's agricultural potential. As the County has previously commented, this claim is incorrect. In Sonoma County in particular, many soil types that were thought to be marginal by NCRS or Storie Index are in productive and profitable use. The FEIS should acknowledge that the project would result in a cumulatively significant loss of potentially productive agricultural land.

The FEIS also should be revised to include mitigation measures to reduce the project's significant land use compatibility impacts. These include:

- Redesigning the project layout and implementing construction techniques to reduce the impact of odors from neighboring farm operations on project patrons, particularly during the summer.
- Requiring the Tribe to accept responsibility for educating project customers regarding the types of agriculture that occur in the area and their potential impacts. This could be accomplished through brochures passed out during registration, signs in the halls, and training of staff regarding the nature of the operations and the County's Right to Farm protection.
- Requiring the Tribe to avoid referring to the County customer complaints about odors and other impacts from properly conducted farming operations in the vicinity of the project.

G-1.16
cont.

The County previously recommended all of these measures in comments to the EIS preparers, yet the FEIS continues to include no mitigation measures for effects on agriculture.

Finally, Page 3.8-50 and Table 3.8-8 should be revised to explain that the project site is considered "Farmland of Local Importance," in productive agricultural use, and designated for continued agricultural use by the County General Plan.

D. Growth-Inducing Impacts

As the County previously commented, response 2.14.1 does not contain evidence supporting its claim that widening Wilfred Ave between the project site and Stony Point Rd would not induce growth. Land use planners have long recognized that road capacity improvements through rural agricultural areas cause growth pressures over time unless mitigation is provided at the outset. The FEIS should be revised to disclose and mitigate the growth pressures and development applications that would result from implementation of the proposed project.

G-1.17

The FEIS should also revise response 2.14.2, which incorrectly presumes that the project is similar in size and scope and has the same growth-inducing potential as the development contemplated by the Northwest Area Specific Plan. The proposed casino, hotel, restaurants, spa, conference rooms, and other tourist-driven amenities would receive far more visitors and vehicle trips that would have ever occurred under the City's plan for the area. As a result, the project would generate far more traffic along Stony Point Rd and Wilfred Ave, leading to greater growth pressures and developer interest along both roadways. The FEIS should be revised to include measures to mitigate these

pressures, rather than incorrectly claim that the project is really no different than the development contemplated by the Specific Plan.

G-1.17
cont.

VI. Water Resources

The County has repeatedly and emphatically commented that the project should be revised to avoid proposed discharges to the Bellevue-Wilfred Flood Control Channel. The channel remains owned by the Sonoma County Water Agency (SCWA), which has discretion over the project's access and ability to use the channel. The channel is already impacted, and that any increase in discharge would be a significant adverse effect. The FEIS should be revised to require the Tribe to submit its detailed building plans to review under the updated SCWA *Flood Control Design Criteria* (FCDC), as any private developer would be required to do, and obtain an easement, license, or other entitlement to use the channel.

Response 2.5.44 falsely claims that the Tribe has the legal right to use SCWA property to convey stormwater and wastewater "as long as such use is reasonable and does not result in injury to others." It also incorrectly states that the Tribe need not submit to FCDC review to determine whether the proposed use is in fact reasonable or would result in injury, and that SCWA thus would have no oversight or approval authority over the discharges and their environmental impacts.

G-1.18

This response is unavailing. We note the Regional Board's previous comments that the Laguna de Santa Rosa is already impaired for nitrogen, phosphorous, sediment, low temperature, low dissolved oxygen, and mercury, and agree with the Regional Board that we "cannot support the introduction of a new discharge of impairing pollutants to this troubled watershed."

The FEIS also errs in its response to comments noting that one-third of the project site is located in a Zone X flood area, and the project would thus contribute to both localized drainage problems and a significant reduction in the flood-carrying capacity of the floodplain. The FEIS responds by noting that the Federal Emergency Management Agency (FEMA) does not regulate Zone X, which is beside the point. NEPA requires that the FEIS analyze all environmental impacts, regardless of whether affected resources are concurrently regulated another federal agency. The project site is designated Zone X because it floods during a 100-year event, and implementation of the proposed project would displace those waters and impact neighboring properties and the environment.

The FEIS should be revised to disclose and analyze the project's real drainage and stormwater impacts, both on neighboring parcels and the floodplain as a whole. In addition, the FEIS should mitigate impacts by requiring that the project implement additional detention facilities and other measures, sufficient to trap all stormwater and other discharges on the project site.

The FEIS should also be revised to fully address the impacts of placing a treatment plant on top of wetlands, as shown in Figures 2-6 and 2-7. The County previously commented that the EIS should be revised to indicate whether mitigation measures or a U.S. Army Corps of Engineers permit would be required to destroy wetlands. Appendix FF truncates the County's comment, and does not actually respond to either issue. It states only that a NPDES permit for wastewater discharges, which misses the point.

The FEIS should also be revised to provide additional information and justification for the monthly Irrigation Efficiency factors used in Appendix D, Attachment B, page 3 (labeled "p.2"). The attachment states at page 1 that "[t]he irrigation efficiency was assumed to vary throughout the year from 0.6 in the summer to 0.95 in the winter," but provides no additional information, much less a citation, calculation, or formula to check the presented data. The County has attempted to research the issue, but has not identified any methodology for deriving or validating the efficiency factors. The FEIS should be revised to explain how it derived the information used to justify the proposed wastewater discharges.

G-1.18
cont.

The FEIS should also be revised to disclose whether its Irrigation Efficiency calculations are based on a normal year of rainfall, which appears to be the case, rather than a wet or 100-year rainfall year. Appendix D, Attachment B, page 3 (labeled "p.2") identifies 6.3 inches as the "Peak Monthly Precip." Yet the chart on the previous page shows that 6.3 inches is close to the average precipitation in a normal January, and nowhere close to a peak monthly precipitation. The chart instead shows that peak precipitation would be 12.71 inches in January, 10.92 in December, and 10.60 in February, among others.

Wet and flood years are reasonably foreseeable in the project area, and the increased rainfall could drastically alter the irrigation efficiency of the proposed discharge site. The FEIS should be revised to clarify how the monthly irrigation efficiencies were developed, and make corrections to account for reasonably foreseeable rainfall years.

VII. Air Quality

The FEIS indicates at pages 4.4-11 and 5-16 (see also Table 5-1) that ROG, PM10, and PM2.5 emissions would exceed daily and annual thresholds, and would therefore be considered significant environmental effects. The FEIS further notes at page 5-16 that implementation of Mitigation Measures A – V (FEIS pages 5-11 through 5-15) for construction and operational emissions would not reduce project ROG, PM10, or PM2.5 emissions to less than significant levels.

Accordingly, the FEIS includes a final air quality mitigation measure, Measure W, which actually includes seven possible measures (including the purchase of emission reduction credits), and which commits the Tribe to implementing one or more of these seven measures if and only if these new measures prove to be “cost and technologically feasible and appropriate mitigation programs are available within the air basin.” The FEIS goes on to note at page 5-16 that if Mitigation Measure W is not implemented, all project alternatives would result in significant and unavoidable impacts to air quality.

While it is encouraging to see the measures included in Measure W, reliance on this measure to mitigate project emissions of ROG, PM10, and PM2.5 emissions to less than significant levels is meaningless in the absence of a formal commitment to implement this measure. It is not appropriate to rely on non-binding measures that may not result in mitigation of significant impacts.

Finally, we note that the FEIS has added at page 4.4-2 a brief mention of potential project concerns related to Diesel Particulate Matter (DPM). However, without any apparent quantitative analysis the FEIS simply concludes that diesel emissions would be less than significant because the project area is sparsely populated, and construction-related emissions would be reduced by virtue of the implementation of Mitigation Measure B. At a minimum, the FEIS should be revised to include a screening level analysis of the potential health risk from DPM from both construction-related and operational emissions. If this analysis shows significant DPM impacts, the FEIS should be revised to include mitigation measures and commit to their implementation. Absent this analysis, it is inappropriate to claim that this impact has been reduced to a less than significant level.

G-1.19

VIII. Noise

We recognize that the FEIS revised Chapter 3.10 to show the locations of noise monitoring and sensitive receptors, and explain the basis for the survey methods used to establish existing ambient noise levels at the representative sensitive receptor locations. We also recognize that Chapter 4.10 has been revised to include an analysis of noise from onsite sources with respect to hourly daytime and nighttime noise limits. While the analysis did not follow County guidelines, it at least provides a quantitative assessment of impacts from stationary noise sources and on-site vehicle circulation.

By contrast, the FEIS's assessment of construction noise continues to be qualitative rather than quantitative, and thus fails to properly disclose and mitigate impacts. The size, scope, and duration of the proposed construction would result in substantial noise, especially when viewed in connection with other reasonably foreseeable projects, such as the proposed commercial and residential development immediately east and north of the Wilfred site. A quantitative analysis is economically feasible, essential to a determination of whether direct and cumulative construction noise would significantly impact sensitive receptors, and necessary for informed public review under NEPA. It is not sufficient simply to state that worst-case average sound levels at sensitive receptors would be 79 ldn, a 24-hour day/night average noise level.

G-1.20

The FEIS should be revised to estimate direct and cumulative construction noise levels at the most affected receptors, and compare the levels to existing ambient levels and other appropriate criteria for speech, activity, and sleep disturbance. The FEIS should further mitigate construction noise impacts by, at a minimum, prohibiting noise-generating construction activities during nighttime and early morning hours. Currently only two mitigation measures address construction noise (at p. 5-71). One calls for project construction to be limited, to the extent feasible, to the period 7:00 AM to 10:00 PM, and the other calls for pile driving (if needed) to be limited to the period 9:00 AM to 5:00 PM. It is not appropriate to rely on measures that would be implemented only when deemed "feasible" by the Tribe. In addition, the FEIS makes no attempt to quantify either the effect of these measures or, more importantly, the mitigation required to reduce construction noise to less than significant levels.

The FEIS also should be revised to correct its assumption that nighttime (10:00 p.m. to 7:00 a.m.) traffic would constitute just 13 percent of the daily total. Traffic noise modeling commonly assumes an 87 percent/13 percent split between daytime and nighttime traffic, and this assumption is appropriate for determining the baseline. It does not appear appropriate for assessing project impacts, however, because the proposed

project would be a 24-hour operation and would generate traffic at all hours. It is incorrect for the FEIS and Appendix R to assume that noise levels during the quiet nighttime hours would fall as low as 35 dBA, 15 to 20 decibels lower than noise levels during the peak hours that correspond to the Ldn. The project would instead generate substantial traffic noise during nighttime hours, and result in substantially higher increases in noise levels than those presented in Table 4.10-4. The FEIS does not respond to previous comments on this issue, and does not provide decision-makers or the public with an adequate description of the effects on the noise environment.

G-1.20
cont.

Finally, the FEIS has been correctly revised to include at pages 5-56 and -57 quantitative goals for noise levels from HVAC equipment or other stationary sources. Mitigation measures remain vague and open-ended, however, and the FEIS does not commit the Tribe to mitigate noise to achieve the quantitative limits. It is still not possible to know whether measures such as sound rated windows and other building sound insulation treatments, or the construction of berms or walls, constitute feasible mitigation that would result in a substantial reduction in noise.

IX. Visual Resources

Response 2.22.1 in Appendix FF correctly acknowledges that the project would be larger than any single commercial building in the vicinity. Indeed, the project would be substantially larger than any other commercial building, because Rohnert Park limits structures to 65 feet in height. The fact that this regulation would not apply on trust land is beside the point; the building would greatly exceed the General Plan and zoning regulations of both the County of Sonoma and City of Rohnert Park, and exceed the significance criteria stated in the FEIS.

Specifically, the structure would introduce physical features that would be substantially larger than planned development to the north and east, and substantially out of character with the limited development to the south and west. It would also significantly alter the natural landscape, dominate the view, and appear as a substantial, obvious, and disharmonious modification of the overall scene, which includes rural uses and much smaller commercial development.

G-1.21

The FEIS should be revised to mitigate the project's visual impacts to a less-than-significant level. Alternative H demonstrates that it is possible to reduce the height of project structures while still meeting the Tribe's economic needs and producing a feasible project. Reducing the height would allow the project to match other planned development in the City and significantly mitigate visual impacts.

EXHIBIT A

Expansion of gambling in Canada: implications for health and social policy

David A. Korn

Abstract

CANADA EXPERIENCED A DRAMATIC INCREASE IN LOCALIZED GAMBLING IN THE 1990s, primarily because of governments' need to increase revenue without additional taxation. This article examines gambling from a public health perspective. The major public health issues include gambling addiction, family dysfunction and gambling by youth. Debates have emerged about the health, social and economic costs and benefits of gambling. Stakeholder and social policy groups have expressed concern about the impact of expanded gambling on the quality of life of individuals, families and communities. Epidemiological studies show that the prevalence of gambling in the general adult population is low but increasing. Of particular concern is the high though steady prevalence of gambling among youth. New technologies have been linked to gambling-related problems such as addiction to gambling by video lottery terminals. Gambling by means of the Internet represents another emerging issue. The article concludes with recommendations for health and social policy related to gambling. These recommendations incorporate a broad public health approach to create a strong research program and to balance risks and benefits.

Gambling is as old as human history. Yet, as we move into the third millennium, Canada is experiencing a new phenomenon — the dramatic expansion of government-owned legal gambling. This shift in government policy is based on the intent to generate additional revenue without increasing taxation, to stimulate economic development primarily in the leisure and entertainment sector, and to strengthen support for charitable gaming.¹ Other factors contributing to increased participation in gambling include the rise of new technologies (e.g., video lottery terminals), mega-lotteries and Internet gambling (e.g., online cypercasinos).

Until recently, gambling has not been framed as a public health matter.² A public health perspective on this problem will balance risks and benefits and will encourage full community participation and involvement of medical practitioners. But the examination of the health, social and economic impacts of the rapid expansion of gambling is still in its infancy. There is a need to enhance awareness within the medical profession about gambling-related problems and to develop effective strategies to prevent and treat pathological gambling.³

An evolving health interest

In 1972 Dr. Robert Custer, a psychiatrist working at a Veterans' Administration hospital in Ohio, first proposed a medical syndrome associated with gambling, which he termed "compulsive gambling."⁴ His efforts brought the problems associated with gambling into the health care arena. In 1980 the American Psychiatric Association included "pathological gambling" in its *Diagnostic and Statistical Manual of Mental Disorders* (DSM), categorizing it as an impulse disorder.⁵ Since then, psychiatry has accepted severe problems associated with gambling as constituting a legitimate disorder. The essential feature of pathological gambling is persistent and recurrent maladaptive gambling behaviour. The psychiatric definition focuses on impaired ability to control gambling-related behaviour; adverse social consequences that disrupt personal, family or vocational pursuits; and tolerance (need to gamble with increasing amounts of money to achieve the desired excitement) and withdrawal. The diagnosis is not made if the gambling behaviour can be better accounted for by a manic

Review

Synthèse

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This article has been peer reviewed.

CMAJ 2000;163(1):61-4

episode. To be eligible for a *DSM-IV* diagnosis of pathological gambling, a person must satisfy at least 5 of the 10 criteria described in the current edition of the manual.⁴ In the late 1980s Lesieur and Blume developed a clinical screening tool, the South Oaks Gambling Screen, to assist clinicians in identifying this disorder.⁵ This tool has become the main instrument used to study the prevalence of problem and pathological gambling in communities.

The first Canadian group of Gamblers Anonymous, a self-help and mutual support fellowship rooted in the 12-step movement, was established in Toronto in 1964 to assist people who identified themselves as having a gambling addiction. The Canadian Foundation on Compulsive Gambling (Ontario) was founded in 1983 to advocate for health services for compulsive gamblers and to enhance public awareness of the problems associated with gambling.

The federal legal framework for gambling in this country is the Criminal Code of Canada. A 1985 amendment gave provinces exclusive control of gambling and of legalized computer, video and slot devices. Provincial governments now own and operate a wide variety of gambling products. The 1990s saw a dramatic growth in the numbers of casinos, slot machines and video lottery terminals across Canada, associated with significant increases in revenues for provincial governments. There are now more than 50 permanent casinos (in 7 provinces), 21 000 slot machines, 38 000 video lottery terminals, 20 000 annual bingo events and 44 permanent horse race tracks in Canada.⁶ By 1997 Canadians were wagering \$6.8 billion annually on some form of government-run gambling activity, 2.5 times the amount in 1992, with casinos and video lottery terminals accounting for almost 60% of government revenue from gambling. During the same period, profits for provincial governments from this source also rose dramatically: in 1997 gambling accounted for at least 3% of total government revenue in all provinces.⁷

Only recently has attention become focused on the health and social policy agenda. Beginning in 1993, provincial governments, led by New Brunswick and Alberta, began to fund services for people with gambling problems. By 1997/98, every province except Prince Edward Island was allocating monies specifically for such services, with expenditures totaling about \$15 million.⁸ The public ownership model thus places provincial governments in the position of carrying out multiple roles and responsibilities: regulator, owner-operator and service provider for gambling-related problems. Concerns have been raised by stakeholder and social policy groups such as the National Council of Welfare⁹ and the Canada West Foundation¹⁰ about the role of governments in encouraging gambling and at the same time protecting the public interest.

The Canadian Public Health Association (CPHA) has been engaged in this issue since the early 1990s. In 1993, the CPHA passed a resolution at its annual general meeting calling for a national assessment of the health impacts of regulated gambling.¹¹ Rather than pursuing funding for the national assessment at that time, the CPHA decided to

gather information on the rising number of health-related initiatives underway across the country. It reported in the *CPHA Health Digest* the information it gathered on provincial and territorial initiatives related to the health impacts of gambling, and made it available to its membership upon request.¹² The CPHA continues to monitor the evolution of gambling across Canada; in 1999, a second resolution related to video lottery terminals was approved.¹³

The Canadian research literature on the health aspects of gambling is limited but growing. *CMAJ* has published only one article on the subject of gambling, a cover story in 1996, in which Kezwer¹⁴ solicited opinion from physicians and gambling experts on the impact of gambling. Also in 1996 the Canadian Centre on Substance Abuse National Working Group on Addiction Policy produced its first examination of the issue, a policy discussion paper on problem gambling.¹⁵ This document expanded the scope of interest in addiction to gambling to incorporate the concept of a continuum of gambling behaviour. It also included a broad definition of problem gambling: "a progressive disorder characterized by a continuous or periodic loss of control over gambling; a preoccupation with gambling and with obtaining money with which to gamble; irrational thinking; and a continuation of the behavior despite adverse consequences." In the area of epidemiological research, the Canadian Centre on Substance Abuse is currently developing a new survey instrument, the Canadian Problem Gambling Index, for use in population studies.¹⁶ The survey instrument, to be completed in fall 2000, will place greater emphasis than existing prevalence tools on measuring the social impacts of gambling on family, coworkers and the community at large.

Most provincial studies on the prevalence of gambling-related problems in the general adult population were undertaken in the mid-1990s.¹⁷⁻²¹ In addition, several epidemiological reports have described the impact of gambling in vulnerable and special populations such as youth, women, older adults and aboriginal people.²²⁻²⁴ A recent meta-analysis²⁵ revealed that, as of 1997, 152 prevalence studies had been conducted in North America. More than half of these studies had been released since 1992, which reflects recent strong interest in the topic.

The Division on Addictions at Harvard Medical School completed a landmark meta-analysis of these available studies, including 35 Canadian prevalence estimates.²⁶ This study showed that over the previous 25 years, the estimated prevalence of gambling problems in the general adult population had been low but rising, whereas among youth and people living in institutions it had been high but steady. The estimated lifetime prevalence in the general adult population for problem and pathological gambling combined (levels 2 and 3 of the Harvard nomenclature) was reported at 5.5%. A similar combined prevalence estimate for the adolescent study population was 13.3%. There were no significant differences in prevalence rates between the United States and Canada. Male sex, youth, and concurrent substance abuse or mental

illness placed people at greater risk of a gambling-related problem. Research done in the United States has indicated a higher prevalence rate in states with high per-capita lottery sales¹⁴ and in areas within 50 miles (80 km) of casinos.¹⁶ There have been no Canadian national prevalence studies of problem and pathological gambling.

Primary care providers have not yet embraced screening for gambling as part of their routine practice pattern. However, these matters are beginning to change. For instance, in 1997 the CMA carried out a needs assessment for physician practice in the area of problem gambling as the first phase of a project to develop office resources.¹⁷ Clinicians seeking resources to assist with the detection and management of patients with gambling-related problems might best contact their provincial health ministry, help line or addiction agency.

A public health matter

A public health approach to gambling is valuable because it offers a broad perspective on the gambling phenomenon and does not focus solely on the more specific area of gambling addiction. It recognizes that there are health, social and economic costs and benefits for individuals, families and communities, and that intervention strategies must provide a balance between these costs and benefits.¹ This perspective on gambling incorporates current views on the socioeconomic and behavioural determinants of health, while acknowledging that there are population groups vulnerable to its harm.

There has been considerable interest in the relation between gambling and socioeconomic status. Recent Statistics Canada reports are instructive.^{23,24} These reports indicated that participation rates in general increased with household income, a trend that held for the purchase of government lottery tickets, spending at casinos and use of slot machines. Bingo was the only gambling activity studied for which there was an inverse correlation with income. In terms of actual expenditures, high-income households spent more than low-income households on gaming activities (specifically lotteries, casinos, slot machines, video lottery terminals and bingo). Of note, however, is the finding that lower-income households spent proportionately more than higher-income households. For example, among households in which at least one person was involved in gambling, those with incomes of less than \$20 000 spent an annual average of \$296 on gambling pursuits, which represented 2.2% of total household income, whereas those with an income of \$80 000 or more spent \$536, only 0.5% of total income. Given that gambling revenue goes to the government, these data suggest that gambling expenditures may be regarded as a voluntary regressive tax that has a proportionately greater impact on people with lower incomes.

A number of public health issues associated with gambling expansion deserve attention. The dominant concern is the emergence of gambling addiction that appears to be

stimulated by increased availability and promotion of casinos and lotteries. Several populations are vulnerable to the impacts of gambling, in addition to lower socioeconomic groups. The cost to families in terms of dysfunctional relationships, violence and abuse, financial pressure, and disruption of growth and development of children can be great.^{19,20} The high prevalence of gambling and gambling-related problems among youth, including betting on sports at colleges and universities, is cause for concern and invites innovative approaches to prevention.^{21,22} Other financially vulnerable and marginalized populations such as older adults, various ethnocultural groups and individuals with substance use and mental health disorders²⁵ may be negatively affected by the expansion of gambling and deserve further study as to the health, social and economic impact.

Technology has become a significant dimension of gambling. Emerging health issues are linked to computer-based innovations and their effect on the frequency, accessibility and types of gambling. Concerns have been raised about the wide availability and addictive potential of video lottery terminals, as well as the dramatic rise of unregulated casino-style gambling Web sites. Although not traditionally defined as gambling, stock speculation and day trading in financial markets represent an important area of activity that can have a profound impact on individuals and social institutions.

Policy implications

Five recommendations are made to strengthen health and social policy regarding gambling.

Balance the public interest: In 1985 provinces were given exclusive control over gambling. All provinces now own a variety of gambling products, receive significant revenue from gambling and fulfill several roles related to gambling, including regulation of the industry and provision of services to those with gambling problems. Policy-makers at all levels of government should regularly monitor and assess the public owner-operator models now in place, to ensure that there is a responsible balance between encouraging gambling as entertainment and protecting the public from gambling-related harm.

Monitor gambling advertising: Public guardians and government regulatory bodies should scrutinize the scope of gambling advertising and, in particular, the messages to youth, lower socioeconomic groups and vulnerable populations. Health officials should advocate in this area and, where possible, ensure that owners and operators prominently display the odds of winning and losing for each of their gambling activities.

Assess the impact on quality of life: Policy analysts should assess the impact of the expansion of gambling on the quality of life of individuals, families and communities. Quality of life encompasses the interplay among social, health, economic and environmental conditions.²⁶ To better inform policy, government should fund a credible scientific body to develop a standard methodology to estimate

the health, social and economic costs and benefits of gambling and related problems. Key stakeholders should be involved in building consensus, and public health expertise should be represented in this activity.

Foster a research agenda: The health research establishment, such as the new Canadian Institutes for Health Research, should support an agenda for gambling that incorporates population health, neurobiological and behavioural research, and health services research. Such knowledge would greatly enhance our understanding of the determinants of gambling-related problems, the relation of gambling to substance abuse and other mental illness, and gambling's health, social and economic costs and benefits. This research would result in more effective primary and secondary prevention programs, as well as lead to more innovative interventions, including brief treatments and pharmacological strategies.

Adopt harm reduction: Health authorities should adopt harm-reduction strategies directed toward minimizing the adverse health, social and economic consequences of gambling behaviour for individuals, families and communities. These strategies would include healthy-gambling guidelines for the general public¹ (similar to low-risk drinking guidelines²) and creative approaches to the early identification of gambling problems, as well as the incorporation of moderation and abstinence goals for problem gamblers, offered in a nonjudgemental fashion.

Conclusion

There is a need for enhanced awareness on the part of health care professionals about the potential impact of gambling on vulnerable, at-risk individuals and special populations. The rapid expansion of gambling represents a significant public health concern that challenges our values, quality of life and public priorities. A broad research agenda is required to better inform a range of questions and solutions. Because gambling is in the public domain in Canada, our health, social policy and political leaders have a special responsibility to make informed and wise choices about costs and benefits and to demonstrate public accountability.

I express my appreciation to my colleagues Dr. Howard Shaffer, Director, Division on Addictions, Harvard Medical School, and Dr. Harvey Skinner, Chair, Department of Public Health Sciences, University of Toronto, for their support, collaboration and interest in my work on gambling.

Competing Interests: None declared.

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Reprint requests to: Dr. David Korn, Department of Public Health Sciences, McMurrich Building, University of Toronto, Toronto ON M4S 1A8; fax 416 489-3359; david.korn@utoronto.ca

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

March 26, 2009

Brad Mehaffy
NEPA Compliance Officer
National Indian Gaming Commission
1441 L Street NW, Suite 9100
Washington, DC 20005

Subject: Final Environmental Impact Statement (FEIS), Graton Rancheria Casino and Hotel Project, Sonoma County, California (CEQ # 20090050)

Dear Mr. Mehaffy:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA reviewed the Draft Environmental Impact Statement (DEIS) and provided comments to the National Indian Gaming Commission (NIGC) on June 4, 2007. We rated the DEIS as Environmental Concerns - Insufficient Information (EC-2) because of concerns regarding impacts to groundwater resources from the preferred Alternative A. The DEIS determined these impacts would be significant to neighboring shallow wells and that the project's groundwater use would represent approximately 4.5% of all current and future pumping in the Southern Santa Rosa plain, a relatively large percentage for a single project in what may be an overdrafted groundwater basin*. We recommended selection of Alternative H, a reduced intensity casino on the Wilfred site, because this alternative would require substantially less sustained groundwater pumping than the preferred alternative.

G-2.1

The FEIS concludes that groundwater levels are rebounding from an historical overdraft condition due to decreasing groundwater pumping since the late 1990's (Appendix G, p. 73). Nevertheless, we continue to have concerns regarding groundwater resources and recommend selection of Alternative H, which meets the project purpose and need while avoiding certain environmental impacts. Alternative H would pump 40% less groundwater than the preferred Alternative A and require a smaller parking lot that could be reconfigured to avoid wetlands. The site plan included for Alternative H (Fig 2-37), however, does not show wetland avoidance. Wetlands could be avoided on the eastern portion of the parcel by reconfiguring the parking lot, and by relocating the wastewater treatment plant north. We recommend these changes be made

* A determination of whether or not the basin is overdrafted will be made by a joint Sonoma County Water Agency (SCWA) and US Geological Survey (USGS) study in future years

if Alternative H is selected. A reduced project footprint could also benefit the federally endangered California tiger salamander. The impact avoidance that could occur under Alternative H is more consistent with the goals and purposes of NEPA (42 U.S.C. § 4331).

G-2.1
cont.

Offsite wastewater treatment would benefit wetlands and the California tiger salamander by obviating the need for an onsite wastewater treatment plant and related habitat disturbance. The FEIS acknowledges that offsite treatment is preferred (App. FF, p. 85), but indicates that this option is not viable since an agreement with the regional sewer authority has not been reached at this time. We recommend that the project proponents continue to pursue such an agreement if the project moves forward.

G-2.2

EPA reviewed the final general conformity determination (Appendix W). Our comments on that determination are attached. We understand that offsets from stationary sources have been purchased to mitigate project impacts, and that an alternative "equally enforceable measure" for the acquisition of emission credits, referenced on p. 9 of the final conformity determination, is no longer being considered.

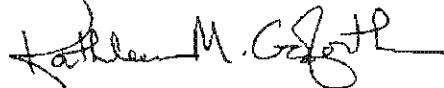
G-2.3

The FEIS includes 75 pages of mitigation measures. We recommend commitments to all mitigation measures be included in the Record of Decision (ROD), and that a mitigation monitoring and enforcement plan, per 40 CFR 1505.2(c), be developed to ensure mitigation is implemented. This is vital because the project will result in significant impacts to environmental resources including soil, water, air, and biological resources, unless mitigation measures are fully implemented and successful.

G-2.4

EPA appreciates the opportunity to review this FEIS. When the ROD is signed, please send a copy to the address above (mail code: CED-2). If you have any questions, please contact me at 415-972-3521, or Karen Vitulano, the lead reviewer for this project, at 415-947-4178 or vitulano.karen@epa.gov.

Sincerely,



Kathleen M. Goforth, Manager
Environmental Review Office (CED-2)

CC: Greg Sarris, Tribal Chairman, Federated Indians of the Graton Rancheria
Devin Chatoian, Environmental Director, Federated Indians of the Graton Rancheria
Patrick O'Mallan, Bureau of Indian Affairs
Greg Tholen, Bay Area Air Quality Management District

Specific SIP Allowance, page 8

Characterization of SIP status is inaccurate: On April 22, 2004, EPA made a finding that the San Francisco Bay Area had attained the 1-hr ozone standard. In doing so, EPA determined that the Clean Air Act's requirements for reasonable further progress, attainment demonstrations, and contingency measures were not applicable to the Bay Area, and, therefore, did not take action on those plan components. In that same action, EPA approved certain elements of the 2001 plan, including the emissions inventory, but did not approve the attainment demonstration nor the plan as a whole. Note that a finding of attainment suspends certain requirements, but does not result in a change of attainment status.

G-2.5

Characterization of status with respect to 8-hr ozone standard is out of date: Ambient monitoring data indicate that the San Francisco Bay Area attained the 8-hr standard by June 15, 2007. However, the BAAQMD has not submitted a redesignation request nor a maintenance plan, both of which are required in order for EPA to consider reclassifying the area as an ozone maintenance area, and does not appear to be pursuing redesignation. In the meantime, a stricter ambient air quality standard for ozone has been promulgated by EPA. Monitoring data indicate the Bay Area is not attaining the 2008 ozone standard; however, final designations will not be made for at least a year.

Conclusion, Section 5.0


There appears to be a typographical error. The reference to 40 CFR 93.155(d) should probably be 40 CFR 93.155(b).

CITY OF PETALUMA, CALIFORNIA MEMORANDUM

Water Resources and Conservation Department, 202 North McDowell Blvd., Petaluma, CA 94952
(707) 778-4546 Fax (707) 778-4508 E-mail: dwrc@ci.petaluma.ca.us

DATE: March 24, 2009

TO: Mike Moore, Director Community Development

FROM: Michael Ban, Director Water Resources & Conservation 

SUBJECT: Graton Rancheria Casino FEIS

XC: John C. Brown, City Manager
Steve Simmons – Utility Manager
Rem Scherzinger – Engineering Manager
Pamela Tuft – Special Projects Coordinator
project file

We have reviewed the FEIS and offer the following comments on its adequacy in responding to our comments on the DEIS:

1. Water Supply: FEIS Section 5 reflects the change of assumption to the use of all groundwater thereby eliminating Mitigation Measure Y (working with SCWA to obtain additional surface water). However on page 9 of 76, Mitigation Measures Section 5, the document retains Measure Y for Alternative F (the Lakeville site). No discussion is offered as to the cumulative impact of implementing this mitigation measure and providing Russian River water for a casino at the Alternative F location, or the cumulative growth inducing impacts of extending a water service line into the southern Sonoma County area.
2. Groundwater impacts: Page 12 of 76 (same section) offers a conclusion statement of "less-than-significant level for Alternatives A, B, C, D, E and H..." then fails to find a finding of *significant and unavoidable* for Alternative F, which should be clearly stated within the document.
3. Mitigation Measure CC.f, Section 5, requires the casino to notify well owners within 2 miles of the casino proposed wells to offer impact compensation from saltwater intrusion due to excessive drawdown of the water table in the southern Sonoma County area. Paying off someone who experiences saltwater intrusion due to overdrafting of the groundwater table by a casino well is not a reasonable and foreseeable reality; it is not adequately quantified, and no guarantee is put into place to ensure compliance. Mitigation AA (page 9 of 75, Section 5) is inadequate, vague, unenforceable, and does not address the long-term, cumulative impact of significantly impairing the groundwater supplies for this agricultural area.

G-3.1

Thank you for the opportunity to review the FEIS and for your work to compile the City's comments.

~~STATE OF CALIFORNIA~~

~~Arnold Schwarzenegger, Governor~~

NATIVE AMERICAN HERITAGE COMMISSION

915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390



March 10, 2009

Brad Mehaffy
National Indian Gaming Commission
1441 L Street NW, Suite 9100
Washington, DC 20005

RE: Notice of Completion for the Graton Rancheria Casino and Hotel; Sonoma County. SCH#2007034002.

Dear Mr. Mehaffy:

The Commission has reviewed the above-mentioned Notice of Completion for the Graton Rancheria Casino and Hotel; Sonoma County. SCH#2007034002 and does not have any comments.

G-4.1

Sincerely,

A handwritten signature in cursive script that reads "Katy Sanchez".

Katy Sanchez
Program Analyst

CC: State Clearinghouse
Janielle Jenkins, Office of the Governor, Legal Affairs ✓
Sara Drake, Department of Justice
Andrea Hoch, Legal Affairs ✓

05-20-11 11:01 AM
100-
11

From: Moore, Mike [mailto:MMOORE@ci.petaluma.ca.us]
Sent: Thursday, March 26, 2009 8:17 PM
To: graton_eis
Cc: Brown, John; Marengo, Vincent; Bates, Curtis; Duiven, Scott; Ban, Michael; Danly, Eric
Subject: City of Petaluma Graton Rancheria FEIS Comments
Importance: High

National Indian Gaming Commission
Attn: Brad Mehaffy

Dear Mr. Mehaffy:

In order to meet the comment period deadline of March 29, 2009, as provided in the Notice of Availability for the Graton Rancheria Casino FEIS, the City of Petaluma is sending you these comments electronically. An original hard copy of these comments, signed by the Mayor of Petaluma, will follow next week by fax and regular U.S. Mail. For your information, I have attached a copy of the City's comment letter on the Graton Rancheria DEIS. In addition, I have attached a memorandum from the City of Petaluma Water Resources and Conservation Department with their FEIS comments related to water issues.

The following comments are from the City's Public Works Department:

TRAFFIC

The City of Petaluma appreciates the responses and changes made with respect to our earlier comments. However, the City remains concerned with the adequacy of the traffic analyses with respect to the distribution of traffic through Petaluma. Additional analysis is needed to assess the potential impacts and identify mitigations within the context of project completion prior to Highway 101 improvements as well as after completion of the planned highway improvements. The proposed casino's trip generation (estimated at 18,000 per day) will result in significant congestion on Highway 101 south of Rohnert Park and consequently the use of alternate, parallel routes through Petaluma by those seeking to avoid that congestion. In particular the City is concerned about impacts to the Lakeville Highway corridor and the Old Redwood Highway interchange and Stony Point Road and intersection with Old Redwood Highway in Petaluma.

The City of Petaluma echoes the concerns of the County of Sonoma with respect to Highway 101 impacts and the FEIS at a minimum should address any funding shortfalls associated with the Highway 101 HOV projects. In addition, should the Record of Decision be issued, the NIGC should select the reduced intensity project as a means of reducing the number of trips and associated impacts.

We thank the NIGC in advance for its consideration of these comments in its decision-making process. If you have any questions or require further information, please do not hesitate to contact me.

Mike Moore
Community Development Director
City of Petaluma
11 English Street
Petaluma, CA 94952
Phone: 707-778-4301
E-Mail: mmoore@ci.petaluma.ca.us
Web: <http://cityofpetaluma.net/cdd/index.html>

G-5.1

DEPARTMENT OF TRANSPORTATION

111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 622-5491
FAX (510) 286-5559
TTY 711

Comment Letter G-6



*Flex your power!
Be energy efficient!*

March 19, 2009

SON-101-15.02
SON101877
SCH # 2007034002

Mr. Brad Mehaffy, NEPA Compliance Officer
National Indian Gaming Commission
1441 L Street, NW, Suite 9100
Washington D.C. 20005

Dear Mr. Mehaffy:

Graton Rancheria Casino and Hotel Project – Final Environmental Impact Statement (FEIS)

Thank you for continuing to include the California Department of Transportation (Department) in the environmental review process for the proposed project. Please find our comments below based on the review of the FEIS, in particular the Transportation section, and the Final Traffic Impact Study (FTIS) (Appendix O):

Alternative A: Intersection Mitigation Measures

The FTIS's cumulative forecast and the mitigation analysis is based on the year 2020 modeling. For mitigation projects involving State right-of-way (ROW), a 20-year study horizon from completion of construction will be required to evaluate cumulative conditions. If it is determined that mitigation proposed in the FEIS is not sufficient to mitigate cumulative conditions in the 20-year study horizon, the Tribe will be responsible for additional mitigation to reduce the Casino project's cumulative impacts to a level of insignificance.

G-6.1

Alternative A: Mainline Mitigation Measures

Comparing the LOS results for the "2008" condition with "2008 + Alt A" condition as well as the "2020" condition with "2020 + Alt A" condition as listed in Table A7 on page 70 of the FTIS, the proposed project will adversely impact various freeway segments between Santa Rosa Avenue and south of Gravenstein Highway. If adding capacity to maintain the same level of freeway operation as in the 2020 (without project) condition is not feasible in the near term, mitigation measures should be considered and implemented to improve weaving conditions in those segments.

G-6.2

It is stated on page 69 of the FTIS that "The project should contribute a proportional share of the costs of the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to south of Gravenstein Highway (SR-116) as well as an additional traffic lane in the northbound direction from West Sierra Avenue to Gravenstein Highway (SR-116) in the long-term." Because the analysis for this project did not identify freeway bottleneck locations and their

associated congestion queues, adding traffic lanes at the proposed locations might only transfer congestion to downstream segments of the US 101 mainline. Further analysis should be conducted prior to considering the option of adding any traffic lanes on sections of US 101. Moreover, adding traffic lanes may not be feasible due to ROW and/or environmental constraints. To address mainline impacts, the Tribe may want to consider contributing to planned improvement projects in the US 101 corridor, such as the installation of Traffic Operations System (TOS) elements (fiber optic cables, changeable message signs), High Occupancy Vehicle (HOV) lane projects within Sonoma County, and/or the Marin-Sonoma Narrows project.

G-6.2
cont.

Other Considerations

The feasibility of mitigation measures proposed within the State's ROW will depend on various factors including the willingness of the City or County to implement the improvements, lead agency determination, and the approval of design exceptions by the Department in particular for changes to the Commerce Boulevard northbound off-ramps. Further details will have to be worked out between the Tribe and the various agencies to ensure that this project's impacts will be mitigated to the level of insignificance.

G-6.3

Should you require further information or have any questions regarding this letter, please call Ina Gerhard of my staff at (510) 286-5737.

Sincerely,



LISA CARBONI
District Branch Chief
Local Development/Intergovernmental Review

- c: Scott Morgan, State Clearinghouse
Sara Drake, California Department of Justice
Janielle Desorner, Office of Governor Arnold Schwarzenegger, Legal Affairs

OFFICE OF THE GOVERNOR

May 1, 2006

Via Facsimile (202) 632-7066 and U.S. Mail

Ms. Andrea Lord, Staff Attorney
National Indian Gaming Commission
1441 L Street NW, Suite 9100
Washington, D.C. 20005

Re: Federated Indians of Graton Rancheria's Request for Restored Lands Determination

Dear Ms. Lord:

I am responding to your letter requesting the State's assistance in determining whether land near Robert Park in Sonoma County, California constitutes "restored lands" of the Federated Indians of Graton Rancheria (Tribe) pursuant to Title 25 United States Code section 2719(b)(1)(B)(iii) in the Indian Gaming Regulatory Act (IGRA). Thank you for extending the State's time to comment until May 1, 2006.

We do not dispute that pursuant to the Graton Rancheria Restoration Act of 2000 (25 U.S.C. § 1300n et seq.; Restoration Act), Congress restored federal recognition for the Tribe, and all rights and privileges of its members that were diminished or lost under the California Rancheria Act of 1958 (Pub.L. No. 85-671, 72 Stat. 619) (25 U.S.C. § 1300n-2(a)-(b)).¹ Also, the Restoration Act's mandatory land acquisition language (see 25 U.S.C. § 1300n-3(a)) supports a conclusion that establishing a reservation in Marin or Sonoma Counties is part of the Tribe's restoration process and, accordingly, such lands become the Tribe's "restored lands" within the meaning of IGRA. The Restoration Act, however, clearly limits the lands eligible for restoration.

G-7.1

¹ The State is currently awaiting responses from various federal agencies to requests for records under the Freedom of Information Act (FOIA) (5 U.S.C. § 552 et seq.) that are relevant to this analysis. The State reserves the right to submit supplemental comments or supporting material as additional information becomes available.

Ms. Andrea Lord, Staff Attorney
May 1, 2005.
Page 2

Specifically, the Restoration Act restricts eligible lands to unencumbered "Indian owned fee land" held by distributees or dependent members (as defined in the 1959 distribution plan, or those persons' heirs or successors in interest, (25 U.S.C. § 1306a-5(a)-(5)). County records indicate the land is currently owned in part by SC Sonoma Development LLC, a subsidiary of Station Casinos and the Tribe's gaming development investor, and Redwood Equities Investment LLC. Therefore, the subject land does not appear to be immediately eligible for mandatory trust acquisition under the Restoration Act.


G-7.1
cont.

Additionally, we note that large portions of the proposed trust acquisition are subject to land use restrictions set forth in the California Land Conservation Act (Govt. Code, § 51200 et seq.), otherwise known as the Williamson Act. It appears the portion of the property on which the Tribe proposes to build the gaming facility is not subject to a Williamson Act contract, but the remaining portion, which the Tribe indicates it will use for environmental mitigation purposes, is subject to the Act. The State has recently been provided a copy of the Tribe's fee-to-trust application, but has not had a chance to review it to determine whether the Williamson Act contract restrictions have been addressed. During the fee-to-trust application process, the State would appreciate the opportunity to comment on this matter to the Bureau of Indian Affairs.

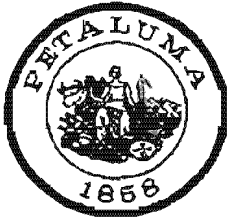
G-7.2

Thank you for considering our comments on the matter.

Sincerely,


ANDREA LYNN HOOT
Legal Affairs Secretary

cc: Penny Coleman, Acting General Counsel, NIGC
Phillip Hogen, Chairman, NIGC
Clay Gregory, Regional Director, BIA
Greg Smith, Chairperson, Federated Indians of Graton Rancheria
John Major, Esq.



CITY OF PETALUMA

POST OFFICE BOX 61
PETALUMA, CA 94953-0061

Pamela Torbiatt
Mayor

Teresa Barrett
David Glass
Mike Harris
Mike Healy
David Rabbitt
Tiffany Renée
Councilmembers

April 1, 2009

National Indian Gaming Commission
Attn: Brad Mehaffy
1441 L Street NW
Suite 9100
Washington, DC 20005

**RE: City of Petaluma Comments on the Final Environmental
Impact Statement for the Graton Rancheria Casino**

Dear Mr. Mehaffy:

The City of Petaluma provided electronic comments on the Final Environmental Impact Statement (FEIS) for the Graton Rancheria Casino in Rohnert Park, California on March 26, 2009 in order to respond for the record prior to the March 29, 2009 date in the Notice of Availability. This letter reiterates those comments and represents the City of Petaluma's official position regarding the adequacy of the FEIS.

We ask that the National Indian Gaming Commission (NIGC) consider these and the comments of other local government agencies in Sonoma County who are greatly concerned about the significant and unresolved impacts associated with the proposed casino. Especially in these uncertain economic times, the NIGC needs to be even more mindful of the limited ability of local government to simply absorb the unmitigated impacts of the proposed Graton Rancheria Casino. We further request that no final decision be made unless and until the FEIS and, if necessary, the project are modified to insure that all identified impacts can be adequately and feasibly mitigated to the satisfaction of the affected surrounding jurisdictions, including the City of Petaluma.

Our formal comments on the FEIS are as follows and, again, restate the comments that were submitted electronically prior to March 29, 2009:

1. **Water Supply:** FEIS Section 5 reflects the change of assumption to the use of all groundwater thereby eliminating Mitigation Measure Y (working with SCWA to obtain additional surface water). However, in Section 5 - Mitigation Measures Section 5, Measure Y ("...work with the Cities of Rohnert Park and Petaluma and SCWA to find and deliver more surface water...") is retained for Alternative F (the Lakeville site). No information is provided on the source of the surface water, as mentioned in our comment for the Draft Environmental Impact Statement. If the source is Russian River water, more information needs to be provided. Also, the EIS would have to address the cumulative impact of implementing this mitigation measure and providing Russian River water for a casino at the Alternative F location, and the cumulative growth

City Manager's Office
11 English Street
Petaluma, CA 94952

Phone (707) 778-4345
Fax (707) 778-4419
E-Mail
citymgr@ci.petaluma.ca.us

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Phone (707) 778-4334
Fax (707) 778-4539
E-Mail
humanresources@ci.petaluma.ca.us

Information Technology
Phone (707) 778-4411
Fax (707) 778-3823
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it@ci.petaluma.ca.us

Risk Management
11 English Street
Petaluma, CA 94952
Phone (707) 778-3695
Fax (707) 778-3697
E-Mail
riskmgr@ci.petaluma.ca.us

G-8.1

G-8.2

inducing impacts of extending a water service line into the southern Sonoma County area.


2. Groundwater impacts: Page 12 of 76 (same section) offers a conclusion statement of "less-than-significant level for Alternatives A, B, C, D, E and H..." then fails to find a finding of *significant and unavoidable* for Alternative F, which should be clearly stated within the document.
3. Mitigation Measure CC.f, Section 5, requires the casino to notify well owners within 2 miles of the casino proposed wells to offer impact compensation from saltwater intrusion due to excessive drawdown of the water table in the southern Sonoma County area. Paying off someone who experiences saltwater intrusion due to overdrafting of the groundwater table by a casino well is not a reasonable and foreseeable reality; it is not adequately quantified, and no guarantee is put into place to ensure compliance. Mitigation AA (page 9 of 75, Section 5) is inadequate, vague, unenforceable, and does not address the long-term, cumulative impact of significantly impairing the groundwater supplies for this agricultural area.
4. The City of Petaluma appreciates the responses and changes made with respect to our earlier comments. However, the City remains concerned with the adequacy of the traffic analyses with respect to the distribution of traffic through Petaluma. Additional analysis is needed to assess the potential impacts and identify mitigations within the context of project completion prior to Highway 101 improvements as well as after completion of the planned highway improvements. The proposed casino's trip generation (estimated at 18,000 per day) will result in significant congestion on Highway 101 south of Rohnert Park and consequently the use of alternate, parallel routes through Petaluma by those seeking to avoid that congestion. In particular the City is concerned about impacts to the Lakeville Highway corridor and the Old Redwood Highway interchange and Stony Point Road and intersection with Old Redwood Highway in Petaluma.
5. The City of Petaluma echoes the concerns of the County of Sonoma with respect to Highway 101 impacts and the FEIS at a minimum should address any funding shortfalls associated with the Highway 101 HOV projects. In addition, should the Record of Decision be issued, the NIGC should select the reduced intensity project as a means of reducing the number of trips and associated impacts.

G-8.2
cont.

G-8.3

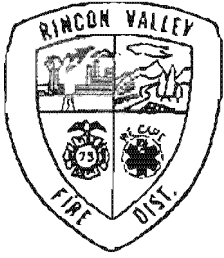
On behalf of the City Council and the citizens of Petaluma, I want to thank the NIGC in advance for its consideration of these comments in its decision-making process. If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Pamela Torliatt".

Pamela Torliatt
Mayor

c: City Council
 City Manager
 City Attorney
 Sonoma County Board of Supervisors
 Sonoma County Mayors
 Governor Arnold Schwarzenegger
 Senator Diane Feinstein
 Senator Barbara Boxer
 Congressmember Lynn Woolsey
 California Senator Mark Leno
 California Assemblymember Jared Huffman



RINCON VALLEY FIRE PROTECTION DISTRICT

8200 Old Redwood Hwy. P.O. Box 530, Windsor, California 95492
Business (707) 539-1801 FAX (707) 539-3046

DOUGLAS WILLIAMS
Fire Chief

JOHN LANTZ
Assistant Chief

March 10, 2009

National Indian Gaming Commission
Attn: Brad Mehafty
1441 L Street NW
Suite 9100
Washington, DC 20005-3584

Subject: Final Environmental Impact Statement
Graton Rancheria
Casino and Hotel Project

Thank you for the opportunity to respond to the Final Environmental Impact Statement for the Graton Rancheria Casino and Hotel Project.

Although the FEIS offers proposed mitigations for fire department response considerations, it fails to address the impacts that will be realized by other jurisdictions serving the area. An assessment of these service area impacts, with corresponding mitigations, requires the completion of a "Standards of Cover for Emergency Response" analysis consistent with a nationally recognized standard.

The analysis needs to emphasize the delivery of an effective firefighting force with specific attention to the impacts upon regional resource draw down (especially in the Highway 101 corridor) and the need to dynamically relocate resources as incidents occur. A remedy to the financial impacts associated with increased service delivery needs to be included in the analysis.

Thank you for your consideration. Please contact me at (707) 539-1801 if you have any questions.

Respectfully,

A handwritten signature in black ink, appearing to read "Douglas Williams", written over a horizontal line.

Douglas A. Williams
Fire Chief

G-9.1



ARNOLD SCHWARZENEGGER
GOVERNOR

STATE OF CALIFORNIA

GOVERNOR'S OFFICE of PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT



CYNTHIA BRYANT
DIRECTOR

May 7, 2009

Comment Letter G-10

Brad Mehaffy
National Indian Gaming Commission
1441 L Street, NW Suite 9100
Washington, DC 20005

Subject: Graton Rancheria Casino and Hotel
SCH#: 2007034002

Dear Brad Mehaffy:

The enclosed comment (s) on your Final Document was (were) received by the State Clearinghouse after the end of the state review period, which closed on March 27, 2009. We are forwarding these comments to you because they provide information or raise issues that should be addressed in your final environmental document.

The California Environmental Quality Act does not require Lead Agencies to respond to late comments. However, we encourage you to incorporate these additional comments into your final environmental document and to consider them prior to taking final action on the proposed project.

Please contact the State Clearinghouse at (916) 445-0613 if you have any questions concerning the environmental review process. If you have a question regarding the above-named project, please refer to the ten-digit State Clearinghouse number (2007034002) when contacting this office.

Sincerely,

Terry Roberts
Senior Planner, State Clearinghouse

Enclosures

cc: Resources Agency

G-10.1

2009 MAY 15 PM 1:03

RECEIVED
NATIONAL INDIAN
GAMING COMMISSION

NATIVE AMERICAN HERITAGE COMMISSION

915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390



March 10, 2009

Brad Mehaffy
National Indian Gaming Commission
1441 L Street NW, Suite 9100
Washington, DC 20005

Clear
3.27.09
1. fe
C



RE: Notice of Completion for the Graton Rancheria Casino and Hotel; Sonoma County. SCH#2007034002.

Dear Mr. Mehaffy:

The Commission has reviewed the above-mentioned Notice of Completion for the Graton Rancheria Casino and Hotel; Sonoma County. SCH#2007034002 and does not have any comments.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst

CC: State Clearinghouse
Janielle Jenkins, Office of the Governor, Legal Affairs
Sara Drake, Department of Justice
Andrea Hoch, Legal Affairs

NOTICE

TO: STATE AGENCY REVIEWERS

RE: TRIBAL RELATED DOCUMENTS

Please review and prepare comments for the attached notice and provide a draft to the Governor's Legal Affairs Office no later than 3-23-09.

Submit comments to:

Janielle Jenkins
Office of the Governor
Legal Affairs
State Capitol
Sacramento, CA 95814
(916) 445-0873 (phone)
(916) 324-6946 (fax)
Janielle.Jenkins@gov.ca.gov

Business and Non-Government Agency Letters

Comment Letter B-1

re: FEIS, Graton Rancheria Casino & Hotel Project, Sonoma County, CA
Comments submitted by Pastor Chip Worthington and Marilee Montgomery
Mail: c/o 4695 Snyder Lane, Rohnert Park, CA 94928
Phone: 707-793-2355

STOP THE CASINO 101 COALITION

Representing the People of Sonoma County & Marin County, California

www.stopthecasino101.com

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DATE: March 24, 2008

TO: Mr. Brad Mehaffy, NEPA Compliance Officer
1441 L Street, Suite 9100
Washington, DC 20005

FROM: Pastor Chip Worthington
Marilee Montgomery
Phone: 707-793-2355
Email: info@stopthecasino101.com

re: re: FEIS, Graton Rancheria Casino & Hotel Project, Sonoma County, CA

Page One of 4

Dear Mr. Mehaffy:

With regard to the Final Environmental Impact Statement (FEIS) for the above-referenced project (Project), we believe that FEIS is deficient in every issue area, and does not meet NEPA's requirement to take a "hard look" at the project's significant impacts and measures to mitigate them to a less-than-significant level. For the purposes of this letter, we herein cite and affirm our agreement with the FEIS Comments of the County of Sonoma and the Sonoma County Water Agency (SCWA) on all the issues areas addressed in those comments.

B-1.1

In addition, as a concerned citizen and resident of the area, we herein submit our own comments.

The California Environmental Quality Act: While a Native American tribe is not subject to CEQA on trust land, the California courts have been quite clear about the duty of local government to ensure that CEQA studies are performed for projects pertaining to Native American endeavors, or to agreements between a government and a tribe that include such projects, when those projects are subject to CEQA.

B-1.2

CEQA studies will be required for all mitigation measures in the FEIS that involve state,

re: FEIS, Geron Rancheria Casino & Hotel Project, Sonoma County, CA
Comments submitted by Pastor Chip Worthington and Marilee Montgomery
Mail c/o 4695 Snyder Lane, Rohnert Park, CA 94928
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county or city roads, and agreements with local agencies for services, such as utilizing the Santa Rosa Municipal Utility District's wastewater facilities or buying water from the County water agency.

Until such studies are completed, no mitigation involving these aspects of the Project can be offered by the Tribe, as it is not known at this time whether or not CEQA will be satisfied, thus it cannot be known if the proposed mitigation measures will be feasible, rendering those mitigation measures meaningless at this point in time.

B-1.2
cont.

The FEIS should be revised to indicate which aspects of the proposed mitigations would be subject to CEQA, and should include language to reflect that such proposed mitigations are tentative until the successful completion of any and all required CEQA studies. The Tribe should bear the burden of the cost of these studies, as any other developer would do.

Bellevue-Wilfred Channel: This channel is incorrectly identified in the FEIS as an "agricultural channel". It is not an agricultural channel, nor is it used for agricultural purposes such as irrigation. The Channel is a short stretch of engineered streambed that is part of the headwaters of the Laguna de Santa Rosa, and is fed by creeks upstream. Prior to the engineering of this waterway, which was undertaken as a flood control project, it was a meandering stream. The FEIS should be corrected to reflect the truth about this channel.

B-1.3

Fertilizer: The Laguna is severely polluted, and fertilizers will exacerbate that pollution. No fertilizers should be used on this property.

Water: The water element and proposed mitigations are completely inadequate, and are fatally flawed. Please refer to the DEIS Comments submitted by the O.W.L. Foundation of Penngrove, CA, and the comments of the United States Environmental Protection Agency pertaining to groundwater usage by this Project, both documents which I herein affirm and reiterate.

B-1.4

Groundwater: (Y): "The Tribe shall work with the City of Rohnert Park, Petaluma and SCWA to find and deliver more surface water, reducing pressures on the Cities to pump additional groundwater." This is not mitigation.

First of all, this betrays an ignorance of the local aquifers that one would not expect after a five year NEPA study. The City of Petaluma does not itself use the aquifer that would be affected by the Project.

B-1.5

Secondly, while the FEIS goes into great detail about low-flow showerheads and toilets and other, pedestrian water conservation measures, it becomes strangely vague in explaining what is meant by this rather cryptic sentence. The FEIS fails to provide details of how, exactly, the Tribe will "find" more surface water. Sources of surface water in Sonoma County are well-identified, and have been for many, many years.

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The FEIS should be revised to include details of what measures the Tribe would use to "find and deliver more surface water", including if the Tribe, either acting on its own or in concert with any other entity, plans to invoke the Winters Doctrine in order to gain control of local or other, river basins and/or other sources of surface water, and what that would mean to all Sonoma County residents and governments.

The FEIS should also include information if the Tribe is planning on building dams and any other pertinent information that would fully explain the actual meaning of this sentence.

These steps must be taken so that a determination can be made as to whether or not this action on the part of the Tribe would result in more impacts and hardship on the community from the Project.

Private Wells: Individuals whose wells would be affected by the Project's groundwater usage are completely reliant on those wells for water, and there are no options available to them through their local government.

The proposed mitigation for neighboring well-owners is inadequate and unrealistic in part, because it imposes a three year deadline on when claims may be made. Overdrafting of this particular portion of the aquifer is well-documented. While one can predict with reasonable accuracy that this Project *will* affect local wells, no one can predict *when* a well might run dry as a result of the casino's water usage. Imposing an artificial deadline will not help those well owners whose well might run dry three years and two months after the project is built.

The Project is so big, that it will continue to create problems with neighboring wells throughout its lifetime. A Sonoma County resident who sinks his well in accordance with local zoning and permitting does so in good faith. Refusal to compensate those whose wells were installed after the completion of the Project is an unrealistic burden to impose on the general public.

The FEIS should be revised so that there would be no deadline of any kind imposed for area well owners to make their claims.

Further, stating that the Tribe should "contract with a (unnamed) third party" to oversee the well compensation program is not mitigation. The entity must be clearly identified in the FEIS, and at the very least, a preliminary agreement for such services must be in place and included in the exhibits in the FEIS.

Wastewater: "Interim" wastewater discharge into the Laguna de Santa Rosa is currently illegal, as no TMDL is yet completed.

Should you have any questions regarding these Comments, please feel free to contact us

B-1.5
cont.

B-1.6

B-1.7

even the FIGR's own 1997 report submitted to the government doesn't make that claim. In fact, the FIGR submitted very few historical or archival documents on the Graton Rancheria to the federal government. There is good evidence that the FIGR's lead genealogist, Sylvia Thalman, utilized the National Archives. There is evidence in documents obtained under a number of Freedom of Information Act (FOIA) requests that the FIGR was very selective in those archival records it submitted to the federal government to support restoration based on the Graton Rancheria. The vast body of archival record on the Rancheria, which does *not* support the FIGR's claims, is missing from Graton's submissions.

As far as when and why then-Assistant Secretary for Indian Affairs Kevin Gover gave his blessing to the Graton Restoration Act, that piece of the puzzle may have been found. Not surprisingly, it follows the same pattern that the FIGR followed: Gover's approval was based on a statement that was simply not factual and that was completely unsupported by the record, as follows:

In a December 21, 2000, letter to Jacob I. Lew, Director of the Office of Management and Budget, Mr. Gover defended a number of the Titles in H.R. 5528, the Omnibus Indian Advancement Act, in an apparent attempt to prevent a Presidential veto of the Bill. In the third-to-last paragraph in the five page letter, Mr. Gover says,

"Title XIV (*the Graton Restoration Act*) is a broadly supported restoration of a terminated California tribe, the Graton Rancheria, which has been seeking equity for almost 40 years (*emphasis the author's*). Accordingly, the Department (*of the Interior*) supports Title XIV."

B-1.7
cont.

The problem with Mr. Gover's statement is that (1) as has already been demonstrated, there was no tribe at Graton Rancheria, and (2) there is no record that **Graton Rancheria** or its residents had been "seeking equity for almost 40 years".

Mr. Gover's statement would suggest that Graton had been "seeking equity" since the early 1960's. However, the dissolution of the Graton Rancheria was not finalized until February 18, 1966. Not even the FIGR's 1997 Report makes the claim that Graton Rancheria or anyone associated with it had been "seeking equity for almost 40 years". In fact, the movement for the restoration of the Graton Rancheria dates back only to 1997. Here is timeline of events from the final dissolution of the Graton Rancheria in 1966 to the point that led to the Graton Restoration Act first proposed in 1998:

In 1966, Frank Truvido became the sole resident on the land. In addition to his own apportionment, he also inherited Andrew Sears' property. Fred Evrill's property went to his heirs as determined by the courts.

It is clear from the record that Mr. Truvido did not want other Indians living on his property. A 1968 letter from the Indian Agency to the Sonoma County District Attorney states that Mr.

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Pastor Chip Worthington



Marilee Taylor Montgomery

ROBB & ROSS

AN ASSOCIATION OF PROFESSIONAL CORPORATIONS

Comment Letter B-2

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LAW, THE STATE BAR OF CALIFORNIA
BOARD OF LEGAL SPECIALIZATION

March 26, 2009

Mr. Brad Mehaffy
National Indian Gaming Commission
1441 L Street, NW, Suite 9100
Washington, DC 20005

Re: Graton Rancheria Casino and Hotel Project

Dear Mr. Mehaffy:

I write with comments on the Final Environmental Impact Statement for the Graton Rancheria Casino and Hotel Project, specifically on NIGC power to approve a management contract.

I submitted comments on the Draft EIS to the effect that NIGC lacks authority over the land Graton intends to purchase and lacks authority to consider the application to approve a management contract. IGRA allows Indian gaming only on Indian lands under the jurisdiction of the tribe. Here, even if the target lands are taken into trust for the Graton, the state will continue to have jurisdiction over land use and gambling at the site. NIGC responds to those comments at Appendix FF, section 2.2.15, and we take issue with the responses.

B-2.1

In the EIS, NIGC states that these are not "substantive NEPA issues." However, whether the issues are considered substantive or procedural is of no consequence. If the NIGC lacks jurisdiction to approve the management contract, no NEPA evaluation is required. The EIS states that this issue will be considered as part of the review of the Management Contract. However, the EIS assumes throughout that NIGC has jurisdiction and bases all of its recommendations on this assumption. This is improper. Jurisdiction is a major "threshold issue" (*Citizens Against Casino Gaming in Erie County v. Kempthorne*, 471 F.Supp.2d 295 (2007) ["CACGEC"]) and should not be assumed. Issues of jurisdiction must be resolved before one can consider whether an action is appropriate. The EIS provides no justification for delaying determination.

Mr. Brad Mehaffy
National Indian Gaming Commission
March 27, 2009
Page 2

The EIS further responds, "...the NIGC was complying with federal law in beginning to prepare the EIS in February 2004 rather than waiting until after making all findings necessary for management contract approvals under IGRA before commencing the NEPA process." However, federal law requires the tribe to identify the land on which the casino will exist and requires NIGC to make a "threshold" determination that such land is Indian land under the jurisdiction of the tribe. (CACGEC) Since NIGC is not following that directive, it is not complying with federal law.

The EIS further responds that the Graton Act provides that any land taken into trust will be part of the Tribe's reservation, and IGRA treats as Indian lands all lands within the limits of any reservation. The EIS therefore concludes, "once the Secretary accepts land into trust for the benefit of the Tribe pursuant to the [Act], such lands will be part of the Tribe's reservation and will constitute Indian lands within the meaning of the Indian Gaming Regulatory Act." We have two responses. First, this does not address the issue. IGRA requires that in order to conduct Class II or Class III gaming on the Indian lands, the lands must be under the "jurisdiction" of the tribal group. See 2710(b) and (d). It is not enough that the lands are "Indian lands". They must also be under the jurisdiction of the tribe. Not all Indian land is under tribal jurisdiction. See *City of Sherrill v. Oneida Indian Nation*, 544 US 197 (2005).

B-2.1
cont.

Second, division of the approval process into two successive steps violates BIA policy. Since 1990, BIA has consistently required that if a tribe submits an application to take land into trust for gaming, the Secretary must first make an Indian lands determination. This is required by the Checklist for Gaming Acquisitions, Gaming Related Acquisitions and IGRA issued September 21, 2007. It also is required by the Memorandum of Agreement between the National Indian Gaming Commission and the Department of the Interior. The response contemplates two successive steps that would base the finding that the land is under the jurisdiction of the tribe on the fact it was taken into trust. This is essentially a bootstrap argument, and is not valid. This would scuttle the community protection provisions built into IGRA and is totally improper. It violates IGRA and it violates BIA's procedures that have been followed for 19 years. Justification for a finding of jurisdiction must be independent of the action being taken.

Mr. Brad Mehaffy
National Indian Gaming Commission
March 27, 2009
Page 3

The EIS' final response is that under 18 USC 1151(a), Indian Country includes "all lands within the limits of any Indian reservation" and tribes are presumed to possess tribal jurisdiction within "Indian Country." However, NIGC fails to provide the full quote and omits the most relevant part. The full quote provides that Indian Country includes reservation lands only if they are under the jurisdiction of the Federal government. It reads: "...the term 'Indian Country'... means ... all lands within the limits of any Indian reservation under the jurisdiction of the United States Government." Thus, the fact that the land is called a reservation does not answer anything. The reservation must be under federal jurisdiction to be Indian Country. Even then, it would not necessarily be under Indian jurisdiction. See *Alaska v. Native Village of Venetie*, 522 US 520, ft 1 (1998).

B-2.1
cont.

I appreciate your consideration of these comments.

Sincerely,


Alan Titus

Comment Letter B-3

March 26, 2009

David Grundman
6715 Dexter Circle
Rohnert Park, CA
94928
707 584-1964

Brad Mehaffy
National Indian Gaming Commission
1441 L Street NW, Suite 9100
Washington, DC, 20005

Via e-mail to graton_eis@nigc.gov

RE: Graton Rancheria FEIS Review Comments

Dear Mr. Mehaffy:

I am a registered civil engineer licensed in the State of California and have been so for over thirty years with considerable experience in water, wastewater, and drainage.

I represent a local concerned citizens group: Reclaiming Our Environmental Rights (ROER) which, is a registered group. I have been reviewing the text of the FIES from a technical point of view based upon my technical knowledge and ability to analyze data.

The ROER met last night and reviewed my comments on the FEIS. It was suggested that the comments be forwarded to you under the public comment period. My comments follow this note.

Thank you for your kind attention to this issue for our local community.

David Grundman

March 19, 2009

David Grundman
5715 Dexter Circle
Rohnert Park, CA
94928
707 584-1964

RE: Graton Rancheria (GR) FEIS Review Comments

1. General Comments

The printed version of the FEIS was not available to the public until about one week after the disk version was available. This reduced the effective review time to 3-weeks.

The disk version moved all of the exhibits (diagrams, maps, etc) away from their intended location to a rear section of the document making it very difficult to follow the text unless you printed out the items and followed the text that way. As such, the disk version is not the same as the printed version further supporting the reduced effective review time to 3-weeks.

B-3.1

As a minimum, the review period should be extended for at least one more week.

A review of the sections dealing with the water supply, wastewater, solid waste, police, fire all exhibit similar shortcomings. Generally, all are out of date using or displaying data ending in 2002. The current date is in 2009, some 7-years later.

2. WATER SUPPLY COMMENTS

There are a number of discussions vacillating between several options. It appears that the FEIS plan is to sink two deep wells for a water supply. There is ample discussion about how the City of Rohnert Park will be reducing their use of wells to a point in 2010 when the city plans to not use its well system except in an emergency. This action would seem to support GR in their plan to draft from the same aquifer.

B-3.2

The City of Rohnert Park is under some sort of agreement to minimize the use of the city's well system until 2010 when the well system will be used only in an emergency. It is planned that the Sonoma County Water Agency (SCWA) will furnish the city's water needs. As part of the science of this, the city must not draft more water than what was determined to be the aquifer replenishment rate.

The City of Rohnert Park was contacted regarding the statements about not using the city's well system. A letter from the city dated March 10, 2009

suggests that we look at the city's 2000 General plan, Section 5.5 Water Supply and Conservation.

The relative cost of water discussion starts on page 5-30, but seems to be just an overview with little to back up statements that SCWA water was less expensive than that from the city's well system. Last year the SCWA increased its rates to the city by about 10 percent and this year, according to information made public during the city's Water Issues Committee Meeting held in Rohnert Park on March 19, 2009, another 10 percent raise in the SCWA rates is soon to come. That will be 20% in 2-years. Maybe the city's well system is not so expensive after all. However, if the city continues to use the well system, the casino may not be able to draw sufficient water from the proposed wells and/or the city's wells will suffer a general loss of capacity.

However, the SCWA is now operating under and impaired condition of delivery. This means that the SCWA will not be able to provide sufficient water to meet the city's needs until such time certain environment conditions are addressed and addition amounts of water can be extracted from the SCWA source(s) of water. It is expected that this impaired operating condition will last for a significant time.

On the surface, this would seem to suggest that the city needs to continue to use the city well system. If so, the plan by GR to draft from the same aquifer would have a detrimental effect on the aquifer levels and the city's ability to use it's well system.

A backup plans for a water supply would be to make a connection to the SCWA aqueduct. However, that supply of water is, again impaired.

The last item appeared in the testimony given at the April 5, 2008 states that there are several MTBE leaks very near the casino site. As such, heavy drafting of water in this area would likely cause the MTBE plume to move and possibly contaminate the proposed Casino wells along with other wells in the area.

The addition of two more wells to an aquifer that cannot support its intended emergency use (City of Rohnert Park) together with the large question of the MTBE contamination is a very poor idea. Appendix Y of the DEIS discusses this very problem. Appendix Y of the FEIS shows a paper investigation of the possibility of migration of the MTBE.

The conclusion shown in that paper investigation was an opinion that lateral movement of the MTBE plume was unlikely (this is not sure) and the plume may have an increase in the vertical downward gradient. The report goes on to suggest that the responsible parties (MTBE) will clean things up. The

B-3.2
cont.

report dated January 15, 2007 does not state that the MTBE is being cleaned up.

The second source of water, SCWA, is currently impaired and will be for some time.

Summary: It appears that the casino does not have a viable source of water and no known third party agreements exist to furnish water to the casino.

B-3.2
cont.

2. WASTEWATER COMMENTS

The FEIS considered several options for addressing the wastewater issue. The preferred plan is to construct an on-site treatment plant and reuse a portion of the effluent for toilet flushing with the remainder being used for landscape irrigation and field irrigation.

During the wet season when irrigation must be reduced, the plan is to place the effluent in holding ponds and/or discharge into the Laguna de Santa Rosa, a very sensitive environmental area.

As a backup plan it is suggested that the casino would connect to the City of Rohnert Park and use the city's facilities/capacities to take care of the wastewater. The city states that this will not be allowed, but this is really a political decision. A second backup plan is to purchase additional capacity in the Laguna Plant for the casino, build their own pipeline to the plant and become a partner in the Laguna Plant. This would likely require the agreement of the other partners, again another political decision. Such an agreement would be very unusual as all of the existing partners are public entities and the casino is private. If the casino were allowed to become a partner in the Laguna Plant, this would set a dangerous precedent.

B-3.3

We must also consider the possibility that the City of Rohnert Park may cooperate with GR by "wheeling" wastewater under the city's entitlement to the Laguna Plant, a political decision, but no agreement to do so is known to exist at this time.

In summary, it is expected that the wet season has a good potential to compromise the on-site treatment plant and holding pond, thus necessitating the release of treated sewage into the Laguna de Santa Rosa. A better and more secure plan would be to connect to the Laguna Plant, however no third party agreement to do so is known to exist at this time.

3. SOLID WASTE

The FEIS states that the solid waste-recycling rate in Sonoma County is at 40 percent in 2000. Again this information is old. The current recycling rate

B-3.4

stands at 64 percent according to Patrick Carter of the County' waste Management Department.

B-3.4
cont.

This is yet another example of how out of date the FEIS data is.

4. FIRE SERVICE COMMENTS

The FEIS has old data shown for 1998-2002. According to a letter from the Rohnert Park Department of Public Safety dated March 16, 2009, fire statistics in a similar table form as shown in the FEIS is not readily available without significant research. It was suggested that raw data was furnished to GR and they arrived at the data table shown in the FEIS.

However, there does exist a document "Fire Division, 2008 Annual Report" in which a table summary of "incident types" is shown. The total of the incident types in that report is 3259 of which 56 percent are "Emergency Medical Services". This compares to a projected (by proportions) 2002 figure of 2342. This appears to be a 39% increase in 7 years.

It is odd that the incident calls increased 39 percent, yet the population did not increase.

B-3.5

The City of Rohnert Park's 2000 General Plan (Section 5.5 Water Supply and Conservation p 5-32) states that the population of Rohnert Park in 2000 was about 41,000 people. According to an Internet source (www.city-data.com/city/Rohnert-Park-California.html), the population of Rohnert Park has decreased slightly to 40,534 people as of July 2007.

But, projecting the fire incident increase over the next twenty years would yield an incident increase starting in 2008 of 111%. This is without the influence of the casino. One can only imagine what the casino will add particularly in "Emergency Medical Services".

No third party agreements are known to exist that would provide fire service to the casino.

5. POLICE SERVICES COMMENTS

The FEIS contains a table on page 3.9-14 which is a comparison of criminal activity in Rohnert Park for 1998-2002. The table lacks a column showing percentage increase/decrease for each of the criminal categories shown.

B-3.6

Some incident items that could be expected to increase with the opening of a casino would be homicide: 200%, Assault: 437%, Burglary: 120%, and Vehicle Theft: 177%.

The table also lacked a total for the criminal activity. The total for 1998 is 1811 incidents and for the year 2002, 2060 incidents. This is a 14% increase in 4 years.

However, in that same letter from the City of Rohnert Park Department of Public Safety dated March 16, 2009, a table of criminal activity matching the one shown on page 3.9-14 was provided for the years 2003 –2008. The provided table also lacked a total, but based upon the information provided, the totals suggest that crime has decreased by 38% during the past 5 years.

Will the crime level increase if a casino is built? It is expected to increase based upon statements contained in the MOU agreement between the City of Rohnert Park and GR. As a result of this acknowledgement by GR, the GR has contributed \$2.863 million to the Special Enforcement Unit under the terms of the MOU signed in 2004. It seems to be working.

Why would the GR contribute so much money to the police?

In summary, the criminal activity appears to be decreasing most likely due to the Special Enforcement Unit that has been paid for by GR. It is not clear if this arrangement will continue nor who will pay for it, but it will likely be needed should the casino open. It is also expected that crime will increase per statements in the MOU.

No third party agreement is known to exist that will provide regular police services at the casino.

6. FINAL SUMMARY

The FIES as printed differs from the disk version as the diagrams; maps etc are located in another section making the FEIS very difficult too follow. Additional review time should be allowed.

The proposed well water supply seems to rely on the City of Rohnert Park not using its well system and there are unanswered questions about nearby MTBE contamination of well water. Other sources of water may not be available for an extended period of time. Therefore, the water supply called for in the FEIS cannot be considered reliable and no other sources have been arranged for.

The proposed onsite wastewater system has a good potential to be compromised during the wet season necessitating the release of treated

B-3.6
cont.

B-3.7

sewage into the Laguna de Santa Rosa. No other proposal to deal with the wastewater has been arranged for, so it is likely that a failure of the proposed wastewater system will be seen.

The data for the solid waste recycling countywide is out of date with the current figure placed at 64 percent.

The fire service figures show a 39 percent increase in calls over a 7-year period with no increase in population. This translates into a 111 percent increase over a 20-year period without the influence of the casino.

The police services had a 14 percent increase in criminal incidents from 1998-2002. The GR has been contributing funds to a Special enforcement Unit to reduce crime since the signing of the MOU in 2004. The unit seems to be working well, but why is the GR contributing so much money to the police?

B-3.7
cont.

There is little discussion about what is planned and what to do if something does not work out. Much of the data used in the FEIS is out of date by some 7-years. Things have changed particularly for the water supply.

No third party agreements are known to exist to address the current conditions, which now raises many unanswered questions. While the project was well thought out in concept, current conditions will likely cause the project to fail as proposed. It should also be noted that the casino lies outside of the City of Rohnert Park with the exception of a small parcel. That parcel will not entitle the adjoining GR lands to city services.

Since this document was only a small sampling of some of the issues of concern for the proposed casino FEIS, it is expected that an actual comprehensive review of the FEIS will yield a considerable of out of date data, inaccurate information all leading to the conclusion that the FEIS is not adequate today.

Comment Letter B-4

re: FEIS, Graton Rancheria Casino & Hotel Project, Sonoma County, CA
Comments submitted by Pastor Chip Worthington and Marilee Montgomery
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STOP THE CASINO 101 COALITION

Representing the People of Sonoma County & Marin County, California

www.stopthecasino101.com

If you have trouble with this fax, please call 707-588-9926

DATE: March 30, 2008

TO: Mr. Brad Mehaffy, NEPA Compliance Officer
1441 L Street, Suite 9100
Washington, DC 20005

FROM: Pastor Chip Worthington
Marilee Montgomery
Phone: 707-793-2355
Email: info@stopthecasino101.com

re: Addendum: FEIS, Graton Rancheria Casino & Hotel Project, Sonoma County, CA

Page One of 2

Dear Mr. Mehaffy:

With regard to the Final Environmental Impact Statement (FEIS) for the above-referenced project (Project), having done additional review of the FEIS over the weekend, we would like to add to our earlier Comments that we do not believe that our individual DEIS Comments were answered in detail and in writing, as required by NEPA.

B-4.1

Further, we herein assert that the National Gaming Commission lacks authority over the land in question, as that land is not Indian-owned.

As the NIGC is well aware, the property that has been the subject of the NEPA study is wholly owned in fee by SC Sonoma Development, LLC, a California Limited Liability Company which itself is not Indian-owned or controlled, but is an affiliate of Station Casinos, Inc. of Las Vegas.

B-4.2

The NIGC says in the FEIS that

"...the Graton Rancheria Restoration Act provides that "Any real property taken into trust for the benefit of the Tribe pursuant to this [Act] shall be part of the Tribe's reservation." [etc omitted] The Indian Gaming Regulatory Act provides

re: FHS, Graton Rancheria Casino & Hotel Project, Sonoma County, CA
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that the term "Indian lands" includes "all lands within the limits of any reservation." (cite omitted) Therefore, once the Secretary accepts land into trust for the benefit of the Tribe pursuant to the Graton Rancheria Restoration Act, such lands will be part of the Tribe's reservation and will constitute Indian lands within the meaning of the Indian Gaming Regulatory Act."

(Appendix FF section 2.2.15, p.29.)

However, the land is not yet in trust, and may not ever be taken into trust, as there is currently litigation in the federal courts which seeks to stop that from happening. (Stop the Casino 101 Coalition et al v. Dirk Kempthorne et al)

So not only is the land not yet Indian land, it may never be Indian land, and the NIGC is incorrect in assuming that it will absolutely happen that the land be taken into trust. The NIGC's authority is not based on assumptions of future, potential actions.

It is also an assumption that the land will automatically be eligible for gaming. That decision cannot be made until the land is taken into trust. Since the land has not yet been taken into trust, such a determination cannot be made as a certainty.

Therefore, we believe that, since the NIGC lacks authority over privately-owned fee land, the NIGC has "jumped the gun" by conducting this NEPA study. We ask that your agency remove itself from this Study until such time as

1. the federal court makes a determination regarding the trust land acquisition, and
2. the trust land is then determined to be eligible or ineligible for gambling under IGRA.

Should you have any questions regarding these Comments, please feel free to contact us by mail to c/o 4693 Snyder Lane, Rohnert Park, CA 94928, or by phone to 707-793-2355.

B-4.2
 cont.

From: Stop the Casino 101 Coalition
To: Mehaffy, Bradley
Sent: Tue Apr 21 13:30:53 2009
Subject: GRaton Rancheria Casino/Hotel FEIS

Dear Mr. Mehaffy:

We first brought the information regarding the litigation pertaining to the Wilfred Avenue Overpass to your attention on September 30, 2008. For your information, 09-15750 *Rohnert Park Citizens to Enforce CEQA v. United States Department of Transportation, et al* has been docketed in the U.S. court of appeal.

Clearly, this lawsuit continues to impact the Graton Rancheria project, and in view of the County's FEIS Comments regarding Wilfred Avenue, the several alternatives located along Wilfred, etc., this litigation still prevents the EIS from being concluded in a meaningful way. Should the Plaintiff be successful in their lawsuit, a NEPA review of the Wilfred Avenue Overpass would be required, and that would delay the Wilfred project for several years. Any traffic projections employing an Overpass over Wilfred Avenue are, at this time, moot. This constitutes a "fatal flaw" under the National Environmental Protection Act, one that is serious enough and obvious enough that a judge (or an agency legal counsel) would deem an EA or EIS unacceptable as written.

B-5.1

Marilee Montgomery

From: ca9_ecfnoticing@ca9.uscourts.gov [mailto:ca9_ecfnoticing@ca9.uscourts.gov]
Sent: Monday, April 20, 2009 1:43 PM
To: rzoja@sbcglobal.net
Subject: 09-15750 Rohnert Park Citizens to Enfor v. United States Department of Tr, et al "Civil Case Docketed"

*****NOTE TO PUBLIC ACCESS USERS***** Judicial Conference of the United States policy permits attorneys of record and parties in a case (including pro se litigants) to receive one free electronic copy of all documents filed electronically, if receipt is required by law or directed by the filer. PACER access fees apply to all other users. To avoid later charges, download a copy of each document during this first viewing.

United States Court of Appeals for the Ninth Circuit

Notice of Docket Activity

The following transaction was entered on 04/20/2009 at 1:40:31 PM PDT and filed on 04/20/2009

Case Name: Rohnert Park Citizens to Enfor v. United States Department of Tr, et al
Case Number: 09-15750

Document(s): Document(s)

Docket Text:

DOCKETED CAUSE AND ENTERED APPEARANCES OF COUNSEL. SEND CADS: No. The schedule is set as follows: Designation of RT for Appellant Rohnert Park Citizens to Enforce CEQA due 04/24/2009. Designation of RT for Appellee Federal Highway Administration and United States Department of Transportation due 05/04/2009. Transcript order for Appellant Rohnert Park Citizens to Enforce CEQA due 05/14/2009. Transcript due for Orig Clerk USDC, San Francisco on 06/15/2009. Certificate of record due 06/22/2009. Appellant Rohnert Park Citizens to Enforce CEQA opening brief due 07/30/2009. Appellee Federal Highway Administration and Appellee United States Department of Transportation answering brief due 08/31/2009. Appellant's optional reply brief is due 14 days after service of the answering brief. (RT)

The following document(s) are associated with this transaction:

Document Description:Civil Docketing Letter

Original

Filename:/opt/ACECF/live/forms/rubent_0915750_6888967_CivilDocketingLetter_101.pdf

Electronic Document Stamp:

[STAMP acecfStamp_ID=1106763461 [Date=04/20/2009] [FileNumber=6888967-0]
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b6e2218f886f11c7b8b80e94dcb91accd7c2dadbb6ebb9f4]]

Recipients:

- McVickar, Sahar, Court Reporter
- O'Connor, Charles Michael
- USDC, San Francisco
- Zoia, Rose

Document Description:Time Schedule Order

Original

Filename:/opt/ACECF/live/forms/rubent_0915750_6888967_TimeScheduleOrderForm_127.pdf

Electronic Document Stamp:

[STAMP acecfStamp_ID=1106763461 [Date=04/20/2009] [FileNumber=6888967-1]
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068b2a1b779a224842695ae75bea625cddfdd86ca717c41ff]]

Recipients:

- McVickar, Sahar, Court Reporter
- O'Connor, Charles Michael
- USDC, San Francisco
- Zoia, Rose

Notice will be electronically mailed to:

USDC, San Francisco
Zoia, Rose

Notice will be mailed to:

McVickar, Sahar, Court Reporter
OFFICIAL COURT REPORTER
United States District Court
450 Golden Gate Avenue
P.O. Box 36052
San Francisco, CA 94102

O'Connor, Charles Michael
OFFICE OF THE U.S. ATTORNEY
450 Golden Gate Avenue
P.O. Box 36055
San Francisco, CA 94102-3495

The following information is for the use of court personnel:

DOCKET ENTRY ID: 6888967
RELIEF(S) DOCKETED:
DOCKET PART(S) ADDED: 6233325

Comment Letter B-6

STOP THE CASINO 101 COALITION

The Voice of the People

879 Golf Course Drive, No. 170
Rohnert Park, CA 94928
www.stopthecasino101.com

If you have trouble with this fax, please call 707-588-9926

DATE: May 7, 2009

TO: Mr. Philip Hogen, Chairman, National Indian Gaming Commission

cc: The Honorable Dianne Feinstein, U.S. Senate
The Honorable Barbara Boxer, U.S. Senate
The Honorable Lynn Woolsey, U.S. House of Representatives
The Honorable Mark Leno, California State Senate
The Honorable Jared Huffman, California State Assembly

FROM: Marilee Montgomery
Community Outreach Coordinator
Phone: 707-548-4756 (Mon. - Fri. 9 a.m. to 5 p.m.)
Email: Marilee@stopthecasino101.com

re: Graton Rancheria Casino/Hotel Project, Sonoma County, CA
FATAL FLAW" in Graton Rancheria NEPA study

Page One of Three

Included below is an article in today's Press Democrat regarding a recent settlement on the Sonoma County population of California Tiger Salamander (CTS). As you can see, the settlement restores as CTS habitat 74,000 acres, including the Santa Rosa Plain and the proposed casino site.

The casino site is the subject of a NEPA study resulting in the recent release of the FEIS. The NEPA study includes CTS habitat and proposed mitigations for same.

The casino site is included within the boundary of the Fish and Wildlife Service map delineating the

B-6.1

potential range of the endangered California tiger salamander. According to the Center for Biological Diversity's Noah Greenwald, the Sonoma County population of the California tiger salamander is on the brink of extinction and needs protection for its habitat in order for this sub-species to have any chance of survival.

U.S. Fish and Wildlife states in the article below that, "...the agreement calls for (the) agency to repropose the 74,000 critical habitat designation by August. The federal agency would then begin public hearings, take new public comment and conduct an economic analysis of the impact." No decision would be announced on Fish and Wildlife's findings until July 2011.

We feel that this new development constitutes a "FATAL FLAW" in the Graton Rancheria NEPA study, especially as the NIGC may have had knowledge of the lawsuit in question at the time the study was being prepared. We feel that it would inappropriate and even reckless for the National Indian Gaming Commission to enter a Record of Decision for the Graton Rancheria FEIS until Fish and Wildlife has finished its analysis in the matter of Sonoma County CTS habitat, as this settlement changes the rules under which the FEIS was conducted and by which U.S. Fish and Wildlife gave its approval to the casino project. Those rules included reducing Sonoma County CTS habitat from 74,000 acre to zero.

B-6.1
cont.

Please give your every attention to this most critical matter.

Wider tiger salamander protections restored

By BLEYS W. ROSE
THE PRESS DEMOCRAT

Published: Wednesday, May 6, 2009 at 5:18 pm

Environmentalists and federal wildlife regulators have settled a federal lawsuit on tiger salamander habitat, agreeing to roll back the clock to 2003 and return to the days when all 74,000 acres of the Santa Rosa Plain were considered as protected.

The agreement reverses the U.S. Fish and Wildlife's 2003 attempt to limit habitat consideration to 21,000 acres west of Highway 101. It also renders moot a locally inspired attempt to craft building permit procedures and mitigation banks in lieu of any habitat designation.

The agreement approved April 10 by the U.S. Court of Appeals in San Francisco was hailed by environmentalists, who feel it saves the salamander. But it was criticized by real estate interests, who said it could bar already-restricted development, particularly in southwest Santa Rosa.

"If anywhere near 74,000 acres is adopted, the housing industry in Sonoma County might never recover," said Paul Campos, vice-president and general counsel at the Home Builders Association of Northern California. "It is on life support now, this might just pull the plug."

But Peter Galvin of the Center for Biological Diversity, which sued the federal government to force full habitat designation, said development interests are using the slumping economy to justify bad environmental practices.

"It is an important victory because we wanted to make sure the tiger salamander stayed on the list of endangered species, that recovery plans for habitat protection remain and that the process is re-energized," Galvin said. "Developers tried to take environmental protections away and they failed."

The 74,000-acre plain stretches from the Laguna de Santa Rosa to the eastern hills of Santa Rosa and from Windsor Creek to Skillman Road in northern Petaluma.

The Center for Biological Diversity, an environmental group based in Arizona, filed the legal challenge to the Fish and Wildlife Service's decision in late 2005 to reduce from 74,000 to 21,000 the number of acres to be considered for critical habitat designation.

Such designation would require developers to study whether salamanders are present and to mitigate impacts if the nocturnal amphibians are adversely affected by construction.

The agreement effectively puts an end to the group of industry, environmental and government leaders called Santa Rosa Plain Conservation Strategy, which attempted to streamline the permitting process and establish mitigation banks for habitat preservation. That effort was put on hold about a year ago when Sonoma County supervisors and Santa Rosa council members said they could no longer fund it.

County planning director Pete Parkinson said the effort has not gone to waste because developers have been getting project approvals by agreeing to fund mitigation banks that are increasing the extent of salamander habitat.

"Although the conservation strategy was never adopted by anybody, the city and the county are still using the guidelines because it shows where mitigation can take place and shows the way projects can

B-6.1
cont.

move ahead," Parkinson said. "Frankly, critical habitat designation is not going to change anything very much."

Al Donner, assistant field supervisor for the U.S. Fish and Wildlife Service, said the agreement calls for his agency to repropose the 74,000 critical habitat designation by August. The federal agency would then begin public hearings, take new public comment and conduct an economic analysis of the impact.

By July 2011, the agency is supposed to announce a decision, he said.

B-6.1
cont.

Individual Letters

Paul D. Stutrud
P. O. Box 2205
Rohnert Park CA 94927

25 February 2009

Mr. Chad Broussard
Analystical Environmental Services
1801 7th Street, Suite 100
Sacramento CA 95811

Re: NIGC Final Environmental Impact Statement and Conformity Determination

Dear Mr. Broussard:

I received your letter dated 18 February 2009 and the DVD that is supposed to be the Final Environmental Impact Statement. I cannot accept this as it is. I require the paper version so that I can read it. Unless you want to furnish me with a 24 inch monitor and computer to access the information.

I think that amount of time to review all of this information in the FEIS should be at least 90 days, preferably six months.

As for your statement that a hard copy of the FEIS is available for public review at the Rohnert Park-Cotati Regional Library is not very encouraging. I protest that one copy is not sufficient and the hours of operation of the library are also detriments to a whole-hearted review of the documentation in the FEIS.

You may mail a copy of the FEIS to my address of 712 Hudis Street, Rohnert Park CA 94928.

You may also mail a copy if the FEIS to my attorney, John F. Hudson at 399 Bonnie Avenue, Rohnert Park CA 94928.

Thank you,


Paul D. Stutrud

received
2/27/09

I-1.1

Comment Letter I-2

990 Echo Ct.
Rohnert Park Ca 94928

March 6, 2009

United States Dept. of the Interior
Office of the Secretary
Washington, D.C. 20240

Dear Mr. McHaffy:

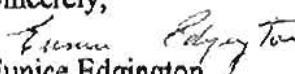
May 16, 2008 I wrote to Dirk Kempthorne, Secretary of Interior regarding the BIA publishing notice of intent to take land just outside of Rohnert Park into trust for the Federated Indians of Graton Rancheria for the purpose of establishing a Las Vegas style casino before an EIS document was completed.

June 27, 2008 I received a letter from Paula Hart, Acting Director, Office of Indian Gaming. In it she states NEPA generally requires publication of an environmental review document before land is placed into trust for an Indian tribe. "In this instance, the acquisition of the property for the Graton Rancheria is explicitly mandated by Congress under the Graton Rancheria Restoration Act, 25 U.S.C. 1300n-3. Because the Secretary exercises little or no discretion in acquisition of the property for Graton Rancheria, NEPA is not applicable."

February 24, 2009 the Supreme court of the United States in *Carcieri, Governor of Rhode Island, et al. v Salazar, Secretary of the Interior, et al.* in a decision 6-3 ruling the supreme court states Indian tribes for whom land can be taken into trust are those that were "recognized" and under federal jurisdiction" as of June 1934.

Furthermore, taking land into trust such as in our neighborhood is a violation of the 10th amendment to the U.S. Constitution. The tribe clearly does not have sovereignty over the 254 acres and the doctrine has never been used to create such "sovereignty"

Sincerely,


Eunice Edgington

CC: Senator Mark Leno
Assemblyman Jared Huffman, 6th District

31009-7

I-2.1

02:11

Comment Letter I-3

MARILEE TAYLOR MONTGOMERY

152 Wilfred Avenue
Santa Rosa, CA 95407
dmagui@scenic.net

URGENT FAX: PLEASE ROUTE TO RECIPIENT ASAP

DATE: March 11, 2009

TO: Mr. Bradley Mahaffy, NEPA Coordinator
NIGC
Fax: 202-632-7066

FROM: Marilee Montgomery
Santa Rosa, CA 95407
707-548-4756

re: Graton Rancheria casino/hotel project, Sonoma County, CA

Page One of One

With regard to the above-referenced project, I'd like to obtain a copy of both the Scoping Comments from both Scoping Hearings (if applicable) and the DEIS Comments submitted by the Laguna de Santa Rosa Foundation, a California 501(c)(3) non-profit located at 2150 W. College Avenue, Santa Rosa, CA 95401.

If the documents can be emailed, please email them to sonomarental@yahoo.com. If the need to be mailed, please mail them to 4427 Taylor Avenue, Santa Rosa, CA 95407.

Thank you in advance for your anticipated cooperation. Please feel free to contact me if you have any questions at all.

I-3.1

Mr. Bradley Mehaffy
NEPA Compliance Officer
National Indian Gaming Commission
1441 L Street NW
Washington, D.C. 20005

Dear Mr. Mehaffy

In September 2008 the first commercial ship sailed through the Northwest Passage. A member of the crew is reported to have claimed that, there was no ice whatsoever. This was a first in human history. No one had predicted it would happen this soon. We're many years ahead of schedule in terms of the loss of the Arctic sea ice. If this loss of surface ice doesn't sway our decision making process now then we are headed for an impending disaster. Our State, our County and all nine Cities in Sonoma have agreed to reduce greenhouse gas emissions from all sources including the 60% of which comes from transportation. Sonoma County staff have declared that the FEIS is deficient in many areas; traffic being one, and that the 18,000 vehicle car trips is most likely an underestimate.

I-4.1

Climate change is the by-product of planning decisions. This casino, essentially a recreational facility, is an attractive nuisance for vehicle use and the consequential carbon gas production. If this project comes to fruition in terms of traffic, even at the low estimated level, it will represent the load of the fifth largest city in Sonoma County. There exists a united effort to reduce our carbon footprint. Here is an opportunity to not increase the difficulty of that obligation.

I am asking you to heed the calls of the local community and reject this FEIS as insufficient on the above reasons, but also because of the following:

- The Casino will cause harm the existing nearby businesses.
- The Casino will cause an increase in crime.
- The Casino will cause an increase in the traffic on Petaluma Hill Road and Stony Point Road, changing the rural character of the communities they serve.
- The Casino will cause environmental impacts detrimental to the habitat for the California Tiger Salamander and other native species.
- The Casino will cause an over drafting of the neighboring wells. The FEIS only states hypothetical scenarios involving the cooperation of others not named in the documents for mitigation and only after the neighbors' wells go dry would they begin trying to find solutions.
- This proposed project would take from the County's control its stated intentions for a ground water management plan and place it in the hands of the courts.

I-4.2

Dan Monte
33 Jefferson Ave
San Rafael, CA 94903

March 27, 2009

IE &
MISSION
INDIAN

To: Mr. Brad Mehaffy, NEPA Compliance Officer
National Indian Gaming Commission
1441 L Street NW
Washington, DC 20005

March 20, 2009

From: Linda M. Long
944 Helene Ct.
Rohnert Park, CA 94928

Response to Graton Rancheria Casino and Hotel EIS/FEIS Alternative A (Wilfred Site) and other sites in the area

Please refer to my comments letter sent on the EIS and to the comments orally expressed by me at the SCOPING hearing regarding the EIS.

The FEIS fails to take a hard look at the concerns stated in my comments letter.

The FEIS fails to take a hard look, as required by NEPA, at the Wilfred Interchange Project, a proposed and approved underpass project on Highway 101 at Wilfred Avenue and Golf Course Drive linking those two streets thus causing thousands of residents on the east side on 101 to be on the same street as the proposed casino resort.

I-5.1

Figure 4.12-6 2020 Cumulative Plus Project PM traffic volumes-Alternative A indicates that #8 modified intersection is not analyzed. A hard look is mandated according to NEPA.

Failure to take a hard look at the impact of the 762,000 casino resort on residents who would be on the same street as the casino is counter to what is mandated by NEPA. Environmental impacts of traffic drawn to/from the casino resort through neighborhoods, within 125 feet of Hahn Elementary School and directly past Honeybee Park and Pool east of 101 must be analyzed.

Thank you,

Linda M. Long
Linda M. Long

CHAPTER 3.0

RESPONSE TO COMMENTS ON THE FEIS

This attachment to the Record of Decision (ROD) contains responses to comments that were received on the Final Environmental Impact Statement (FEIS).

GOVERNMENT AGENCY COMMENTS

G-1 – SONOMA COUNTY BOARD OF SUPERVISORS/ SONOMA COUNTY WATER AGENCY

G-1.1 As requested, Comment Letter G-1 has been considered in the ROD. The commenter provides a summary of comments that are made later in the letter. Responses to the summarized comments are therefore provided below in response to the detailed comments made throughout the letter.

Regarding recirculation, please see FEIS Appendix FF, Response to Comment 2.1.7. As will be demonstrated in specific responses to comments below, after over five years of consultation and analysis culminating in a FEIS that is over 8,000 pages long and that has been found to be more than adequate by the U.S. Environmental Protection Agency (USEPA - see FEIS Appendix AA, Comment Letter G-29), the National Indian Gaming Commission (NIGC) has taken a “hard look” at all potential environmental impacts. In addition, note that supplementation of a FEIS is required only if “there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” 40 C.F.R. 1502.9(c)(1)(ii). As will be demonstrated in specific responses to comments below, none of the claimed deficiencies noted by Comment Letter G-1 constitute significant new circumstances or information that would necessitate the supplementation of the FEIS.

The County’s position on the approval of Alternative H is noted for the record. After this comment and input received during the FEIS waiting period by the United States Environmental Protection Agency (USEPA), the NIGC has decided to choose a development that is in between Alternatives A and H in the size and components of the proposed facilities. This development is hereby referred to as Variant H-sub1. Variant H-sub1 is fully encompassed within the range of

alternatives included in the FEIS and is therefore appropriately included within the ROD (40 C.F.R § 1505.1(e)). A description and an analysis of the environmental impacts of Variant H-sub1 is included in the ROD, Attachment 3. Required mitigation has been modified in Section 6.0 of the ROD to account for reductions in impacts that would occur under Variant H-sub1.

Although Variant H-sub1 is in between Alternatives A and H in size and components, it is closer in design to Alternative H. As described in ROD, Attachment 3, Variant H-sub1 is 227,400 square feet (sf) smaller than Alternative A and only 121,500 sf larger than Alternative H. Furthermore, the gaming floor of Variant H-sub1 is identical in size to Alternative H and like Alternative H, Variant H-sub1 does not include a show room.

- G-1.2** Please see FEIS Appendix FF, Responses to Comments 2.10.36, 2.11.4, 2.11.6, 2.11.10, 2.11.45, and 2.14.1. Widening of Wilfred Avenue from Redwood Drive to the Urban Growth Boundary to five lanes is proposed in the Rohnert Park General Plan. In addition, as noted in FEIS Section 5.2.7, the Federated Indians of Graton Rancheria (Tribe) has agreed in a Memorandum of Understanding (MOU) with the City of Rohnert Park to compensate the City for one half of the actual cost of the Wilfred Avenue widening from Redwood Drive to the Urban Growth Boundary that is included in the City's General Plan. The Tribe has further stated its intention to pay the full cost of this widening (subject to future reimbursement) should this segment of Wilfred Avenue remain subject to County jurisdiction. Finally, the FEIS traffic study (Appendix O) recommends widening Wilfred Avenue to three lanes in the near term (this recommendation is also referenced in FEIS Appendix FF, Response to Comment 2.11.10) and to five lanes in the long term. This recommendation has been added to Section 6.0 of the ROD as required mitigation in response to this comment.

Regarding the mitigation measure to contribute to safety improvements along Wilfred Avenue, this was meant to improve the safety of the roadway west of the Urban Growth Boundary, where relatively few project trips would be travelling. Thus, capacity improvements are not needed (see FEIS Appendix O and Sections 4.8 and 4.12 for an analysis of intersection operations along Wilfred Avenue). Safety improvements, however, would be beneficial even absent a need to increase capacity. Thus, this measure was added after reviewing comments and discussing the issue with County staff in an attempt to improve even the portions of Wilfred Avenue where the project impact is substantially reduced.

Regarding the use of “recommended” language in Section 5 of the FEIS, please see FEIS Appendix FF, Responses to Comments 2.6.4 and 2.11.44. Please see FEIS Appendix FF, Responses to Comments 2.11.1, 2.11.4, and 2.11.18 regarding the methodology for estimating project traffic trips. As noted in FEIS Appendix FF, trips are more likely overstated rather than understated, as suggested by the commenter. Also, please see Response to Comment G-1.1 regarding the selection of Variant H-sub1. Variant H-sub1 would result in a reduction of daily trips of almost 20 percent, from 18,261 to 14,724. Please see ROD Attachments 3 and 4 for more detail on expected traffic impacts of Variant H-sub1, which would be in between the impacts that would occur for Alternatives A and H.

- G-1.3** Please see FEIS Appendix FF, Response to Comment 2.10.36. In response to previous Sonoma County comments, a mitigation measure was added to FEIS Section 5.2.7 that recommends that the Tribe “fully funds the restructuring of Labath Avenue and Langner Avenue between Wilfred Avenue and Business Park Drive following construction associated with Alternatives A or H to facilitate site access.” Facilitation of site access necessarily requires the widening of at least portions of Labath and Langner to allow vehicles to transition from the roadway to parking facilities. The FEIS recommends that improvements to Langner and Labath take place to facilitate access whether or not the roads remain in public ownership. It is not known whether the Tribe would petition the County to relinquish these roads from public ownership.
- G-1.4** Regarding the distribution of project trips, the analysis of traffic impacts, and traffic safety, please see FEIS Appendix FF, Responses to Comments 2.11.4, 2.11.10, 2.11.19, 2.11.24, and 2.11.25. Pursuant to analysis in FEIS Appendix O and Sections 4.8 and 4.12, while various intersection improvements are recommended, no road segment capacity improvements are warranted along either Stony Point Road or Millbrae Avenue. It is assumed that “non-local” traffic would be more likely to use primary access routes from U.S. Route 101 (US-101) rather than secondary routes along Millbrae Avenue due to unfamiliarity with the local street network. In addition, it is reasonable to assume most drivers can travel safely along roadways with less than perfect pavement structure. Regarding reduced traffic impacts under Variant H-sub1, please see Responses to Comments G-1.1 and G-1.2.
- G-1.5** Regarding the acceptable level of service (LOS) standard, please see FEIS Appendix FF, Response to Comment 2.11.15. Regarding the analysis of impacts and recommended mitigation measures along US-101, please see FEIS Appendix FF, Responses to Comments 2.11.2, 2.11.3, 2.11.10, 2.11.12, 2.11.14, 2.11.23, and

2.16.3. The FEIS traffic analysis (Appendix O and Sections 4.8 and 4.12) considers the project traffic in addition to cumulative background traffic on a roadway network that is reasonably foreseeable for the analysis year. The FEIS acknowledges that many of the high occupancy vehicle lane projects and the Wilfred interchange project are either fully or partially funded at this time. The FEIS recommends that the Tribe fund a fair share of the “remaining costs (if any)” of these projects. Therefore, contrary to the contention of the commenter, the FEIS does not rely at all on the need for these projects to require additional funding. As noted in FEIS Section 4.8.2, in the near term “no freeway segments or ramps would operate at an unacceptable LOS with the addition of Alternative A traffic.” Thus, the near term freeway segment measures cited by the commenter are mitigation measures that are recommended to further reduce less than significant impacts, not to reduce significant impacts to a less than significant level. This is in contrast to future cumulative conditions with Alternative A traffic, where several freeway segments and ramps are forecast to operate at an unacceptable LOS (see FEIS Section 4.12.3). Thus, additional freeway mitigation measures are proposed, including capacity and/or transit measures, to mitigate significant future traffic impacts (see FEIS Section 5.2.7).

The California Department of Transportation (Caltrans) Methods for Calculating Equitable Mitigation Measures (Appendix B of the Caltrans Guide for the Preparation of Traffic Impact Studies) includes several alternative formulas for calculating proportionate share. The FEIS is not inconsistent with any of these formulas. As noted in FEIS Section 5.2.7, “The proportionate share calculation methodology recommended by the agency with jurisdiction shall be used for each individual improvement.” Therefore, for improvements over which Caltrans has jurisdiction, Caltrans will dictate the methodology for calculating proportionate share. For improvements over which Sonoma County has jurisdiction, the County could choose to use the Caltrans methodology or some other methodology preferred by the County. The FEIS recommendation to establish an escrow account prior to construction applies to near term traffic improvements. A requirement has been added to Section 6.0 of the ROD which clarifies that an escrow account shall be established for cumulative improvements prior to 2020. Please also see FEIS Appendix FF, Responses to Comments 2.6.4, 2.11.18, 2.11.23, and 2.16.3. Regarding reduced traffic impacts under Variant H-sub1, please see Responses to Comments G-1.1 and G-1.2.

- G-1.6** As noted in FEIS Appendix FF, Response to Comment 2.11.10, where a full-share road improvement is recommended, “the Tribe would be responsible for full payment of the costs to construct the mitigation measure.” Also see FEIS Section

5.2.7, which states that funds provided by the tribes shall be for design, approvals/permits, and construction. Therefore, the County would not incur any unfunded administrative or organizational burden. Please also see FEIS Appendix FF, Responses to Comments 2.11.18, 2.11.34, 2.11.44, and 2.16.3.

- G-1.7** Regarding mitigation for impacts to roadways from construction traffic, please see FEIS Section 5.2.7, and Appendix FF, Responses to Comments 2.10.36 and 2.11.13. FEIS Section 5.2.7 includes a mitigation measure to ensure surrounding roadways are resurfaced to “at least pre-construction condition” if roadway deterioration has occurred as a result of construction.

The mitigation measure restricting the importation of fill material is misquoted in the comment and it is quoted out of context, which distorts the meaning of the measure. The full measure in FEIS Section 5.2.7, which was added after consultation with Sonoma County, states that the Tribe shall, “minimize the amount of construction fill transported on the surrounding street network by eliminating the off-site travel route except where necessary to obtain materials that cannot be obtained on-site. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.” Soil generated from earthwork on the southern portion of the property would accommodate the vast majority of fill needed in the northern development area, as demonstrated in FEIS Section 2.0 and Appendix C, which show that on-site excavation would provide a sufficient amount of fill material to result in a “balanced” site, without the need to obtain additional fill material off-site. Nonetheless, a minimal amount of materials may be needed from off-site in order to maintain optimum engineered soil conditions for development.

Lane closures can only be allowed at the discretion of the County. Please see FEIS Appendix FF, Response to Comment 2.16.3. The expected fill importation schedule cited from FEIS Section 4.8 is prior to the application of the mitigation measure limiting off-site importation of fill material. With the implementation of this mitigation measure, most and possibly all off-site fill trips would be eliminated. Thus, the remaining off-site fill trips that are necessary (if any) would be able to meet a requirement to be scheduled outside area-wide commute peak hours.

- G-1.8** Please see Responses to Comments G-1.1, G-1.2, G-1.3, and G-1.5.

FEIS Page 3.8-6 currently refers to SCT (Sonoma County Transit). Thus, it is clear from both the text and the context that the reference made is to Sonoma County Transit and not the Sonoma County Transportation Authority (SCTA).

Regarding the current funding status of the Sonoma Marin Rail Transit (SMART) project, future construction of the SMART project was addressed in the FEIS where relevant (see FEIS Sections 4.12.2, 5.2.3, and 5.2.7; FEIS Appendix FF, Responses to Comments 2.6.4, 2.6.16, 2.11.8, and 2.11.10; and FEIS Appendix O). No reduction of project trips were assumed due to the future construction of the SMART project, however, in order to provide a conservative traffic analysis that provides a worst case analysis of potential traffic impacts. The passage of Measure Q does not change the analysis in the FEIS nor require the revision of the FEIS.

There is no reference to the southbound Rohnert Park Expressway ramp on FEIS page 3.8-8. Assuming the commenter is referring to the reference to this ramp on page 3.8-9, the language is meant to confer the conditions that were in place at the time of the traffic survey. As noted in the text, in Table 3.8-3, and in Appendix O, pre-construction conditions were reported as existing conditions. This methodology is conservative in that it likely represents a worst case traffic condition in the near term given that the completion of the ramp has improved the traffic condition. The ramp is assumed to be complete in future cumulative baseline conditions. Please see FEIS Appendix FF, Responses to Comments 2.4.11 and 2.11.18.

As noted in FEIS Section 5.2.7 and Appendix O, except for possible contributions to HOV lane projects, most of which are nearly complete (and thus were not credited to the receipt of mitigation funds from the Tribe in Table 5-12), no near-term freeway segment improvements are recommended for Alternative A. Hence, a near term LOS after Mitigation column was not necessary in FEIS Table 5-12 for Alternative A.

- G-1.9** Please see FEIS Appendix FF, Responses to Comments 2.9.2, 2.9.26, 2.10.6, 2.10.10, 2.10.27, and 2.10.32. The existing MOU between the Tribe and Sonoma County is a fully executed and binding document that creates obligations on both the Tribe and Sonoma County should the project move forward. Thus, it would be improper for the FEIS to ignore the existence or implications of the MOU. Nonetheless, contrary to the contention of the commenter, the FEIS does not rely on the MOU as a substitute for the analysis and mitigation of impacts. As noted in FEIS Section 4.9.1, “With the fiscal mitigation listed in Section 5.2.6, (law enforcement services) impacts to the County would be less than significant.” Thus,

the FEIS is relying on the mitigation payments specified in Section 5.2.6, which were developed by the NIGC and its socioeconomic consultants and is not reliant on any future MOU negotiations.

Regarding the impact of future annexation on the provision of law enforcement services, please see FEIS Appendix FF, Response to Comment 2.10.6. The recent annexation of Creekside Middle School by the City of Rohnert Park does not alter the conclusion stated in Response 2.10.6 that the City of Rohnert Park could provide law enforcement services to the site by contract, similar to the City's provision of services to the Creekside Middle School before it was annexed. The 2006 agreement to provide services to the Creekside Middle School is entitled, "An Agreement Between the County of Sonoma and the City of Rohnert Park for the Extension of Law Enforcement Services, as Limited and Defined Herein, by the City of Rohnert Park to Creekside Middle School in the Unincorporated Area of the County of Sonoma." The agreement clearly states that Creekside Middle School is located in unincorporated Sonoma County (which was true at the time of the agreement) adjacent to the City of Rohnert Park and that pursuant to the agreement the City will provide law enforcement services to the school. The agreement notes that the Rohnert Park City Council and the Rancho Cotati School District "are in the process of discussing possibly annexing the School into the City," but the agreement does not rely on that potential future annexation in any way.

- G-1.10** Please see FEIS Appendix FF, Responses to Comments 2.10.4, 2.10.7, 2.10.11, 2.10.12, and 2.10.19. As noted in FEIS Section 4.9.1, the Tribe could contract with any one of a number of service providers for primary fire protection services and "An agreement for primary services would prevent a reliance on mutual/automatic aid services, ensuring a less than significant impact to mutual/automatic aid services."

Regarding the Sutter-Memorial Hospital transaction, please see FEIS Appendix FF, Responses to Comments 2.10.2 and 2.10.19. The recently proposed business plan by the Sutter Medical Center (including construction of a 70-bed hospital) does not affect the conclusion in FEIS Section 4.9.1 that multiple hospitals would continue to serve the Wilfred site (even absent the construction of new facilities by the Sutter Medical Center). Thus, revisions to the FEIS are not required. Please see Response to Comment G-1.1.

- G-1.11** Please see FEIS Appendix FF, Responses to Comments 2.9.2, 2.9.3, and 2.9.23. The FEIS analyzes multiple studies, many of which are more current than the 2000

study cited by the commenter, to develop comprehensive estimates for new problem and pathological gamblers rather than to attempt to develop complicated and potentially less accurate estimates for increases in problem gambling according to certain segments of the population. The comprehensive estimates in the FEIS account for increased prevalence rates for certain population groups and decreased prevalence rates for other population groups. FEIS Section 5.2.6 includes several mitigation measures designed to prevent or reduce the incidence of problem gambling for all segments of the population. FEIS Section 5.2.6 also includes mitigation measures that recommend compensation to problem gambling treatment and prevention programs. The FEIS properly leaves the specific distribution of the mitigation funds to the operators of these programs, whom are in the best position to determine whether to focus the funding on certain segments of the population, on the general population, or both.

G-1.12 Please see Response to Comment G-1.11. Please see FEIS Appendix FF, Response to Comment 2.16.4.

G-1.13 Please see Response to Comment G-1.11. Please see FEIS Appendix FF, Responses to Comments 2.9.2, 2.9.7, 2.9.8, 2.9.30, 2.10.6, 2.10.26, 2.10.27, and 2.10.28. As noted in Response to Comment 2.9.2, while there may be a relationship or a correlation between problem or pathological gambling and domestic violence, “problem and pathological gambling does not cause the previously mentioned social ailments (domestic violence, divorce, child neglect, homelessness).” The mitigation language referred to by the commenter in FEIS Section 5.2.6 was added at the request of Sonoma County but is not evidence of a “nexus” between casino operations and domestic violence.

Regarding the methodology for calculating fiscal impacts to the County, please see Responses to Comments 2.9.26, 2.10.6, 2.10.26, 2.10.27, 2.10.28, and 2.10.37.

Regarding the City of Rohnert Park Special Enforcement Unit (SEU) and potential impacts to crime, please see FEIS Section 4.7.1; Appendix II; and Appendix FF, Responses to Comments 2.9.2, 2.9.7, and 2.9.10. As noted in the responses to comments, the Tribe has continued to fund the SEU at the request of the City of Rohnert Park, even though it is not currently obligated to do so under the MOU between the City and the Tribe. The FEIS in no way “acknowledges that the project would result in a 95% increase in drug arrests...” The City of Rohnert Park Resolution in FEIS Appendix II acknowledges that “the SEU has been extremely successful in reducing criminal activity in Rohnert Park as noted by the 36% decrease in burglaries and the 95% increase in drug arrests.” The City of Rohnert

Park resolution reports the situation following the negotiation of the MOU between the City and the Tribe and the Tribe's recent willingness to voluntarily continue these donations. If the use of these funds to make drug arrests by the City is burdening County treatment programs, the County should encourage the City to reduce drug arrests to manageable levels, utilize City programs for substance abuse treatment, and/or compensate the County for increased treatment costs.

G-1.14 Comment noted. Please see FEIS Section 5.2.3 for mitigation for indoor air quality impacts, which are not limited to segregation of smokers from non-smokers. Please also see FEIS Section 4.4.2 and FEIS Appendix FF, Responses to Comments 2.6.8 and 2.6.16.

G-1.15 The customer survey mitigation measure has been revised as recommended in Section 6.0 of the ROD. Regarding alcohol use at the casino, please see FEIS Appendix FF, Responses to Comments 2.9.2, 2.9.7, 2.9.14, and 2.9.30. Mitigation measure W on FEIS page 5-69 clearly states that the Tribe's internal monitoring program would support enforcement of the incidence of parties involving minors. Underage drinking is a common occurrence at such parties. Thus, utilizing the internal monitoring program for reducing the incidence of these parties would also serve to reduce the incidence of underage drinking. Regarding potential impacts to crime, including prostitution, please see FEIS Appendix FF, Responses to Comments 2.9.1, 2.9.2, 2.9.3, 2.9.7, and 2.9.8. Mitigation measure Y on FEIS page 5-69 has been revised as recommended in Section 6.0 of the ROD.

G-1.16 Responses have been provided for similar Sonoma County comments within Appendix FF of the FEIS, under Response to Comments 2.13.2, 2.13.5, and 2.13.11. The comment is noted with regards to jurisdictional authority of Sonoma County on land within the Rohnert Park sphere of influence. Development proposed on non-trust land outside of city limits is subject to Sonoma County approval. However, in the anticipation of annexation, Rohnert Park has adopted land use plans for areas within its sphere of influence. The referenced statement in FEIS Appendix FF, Response to Comment 2.13.2 that the City of Rohnert Park retains approval authority within its sphere of influence is not correct until this area is annexed by the City. However, the same response notes that "...the majority of the Wilfred site is currently located within the unincorporated County and that development on non-trust lands outside of the City of Rohnert Park located within the unincorporated County would be subject to County approval." Thus, a full reading of the response clarifies any misconceptions that might be made after only a partial reading. Furthermore, although the FEIS does not reflect the recent update to the Sonoma County General Plan, the analysis of land use and

agricultural impacts within the FEIS was completed under the assumption that the Wilfred site was designated for agricultural purposes as determined through designation as Diverse and Land Extensive Agriculture by Sonoma County. As noted in both the DEIS and the FEIS, the Proposed Project would not be consistent with local land designations for the Wilfred Site. This conclusion remains unchanged after the recent Sonoma County General Plan update. Thus, there is no need to revise or supplement the FEIS, as stated in Response to Comment G-1.1.

Please refer to FEIS Response to Comment 2.22.1 regarding visual impacts from the Proposed Project. As stated in FEIS Section 2.0, the Proposed Project includes a 2-story casino and an 8-story hotel. Please see Response to Comment G-1.1 regarding Variant H-sub1, which would reduce the height of the hotel to 6 stories. Wilfred Site development would occur in close proximity to existing developments in Rohnert Park (see FEIS Figure 3.8-9), including a Home Depot, a WalMart, a Target, a movie theatre, several hotels, a business park with several large light industrial operations, and dozens of other commercial establishments.

Information describing the meeting of requirements within the Sonoma County Right-to-Farm Ordinance is located within Section 4.8 of the FEIS. A response to similar comments on the Right-to-Farm Ordinance can found under FEIS Appendix FF, Responses to Comments 2.13.13 and 2.20.6. Please refer to FEIS Appendix FF, Response to Comments 2.20.3, 2.20.5, and 2.20.7 to find responses to differing claims of site soil quality and claims of incorrect FEIS analysis of localized and Sonoma County agricultural impacts. As stated in Response to Comment 2.20.5, “it should also be emphasized that the Wilfred Site, Stony Point Site, and Lakeville Site are currently utilized for non-irrigated pasturelands, and there is no prior history of intensive agriculture practices for high value crop production at these locations. It is projected that, while it may be possible to achieve such yields on the sites, the local conditions make each of the sites undesirable for such uses.”

- G-1.17** As noted in FEIS Appendix FF, Response to Comment 2.14.1, improvements would serve to mitigate cumulative impacts rather than creating excess capacity for future unplanned growth. FEIS Appendix FF, Response to Comment 2.14.2 does not make any claims or presumptions that the proposed project is “similar in size and scope and has the same growth-inducing potential as the development contemplated by the Northwest Area Specific Plan.” Nor does the response claim that the project is “really no different than the development contemplated by the Specific Plan.” Instead this response and Section 4.11.1 of the FEIS independently assess the potential for commercial growth inducement considering existing and

planned development in the area, in addition to the nature of the development that would occur on-site under the Proposed Project. Please see Response to Comment G-1.1 regarding Variant H-sub1, which would be reduced in size and scope when compared to the Proposed Project.

- G-1.18** Regarding potential stormwater and wastewater discharges to the Bellevue-Wilfred Flood Control Channel, please see FEIS Appendix FF, Responses to Comments 2.5.8, 2.5.9, 2.5.10, 2.5.11, 2.5.22, 2.5.23, 2.5.31, 2.5.33, 2.5.34, 2.5.35, 2.5.42, 2.5.44.

Regarding potential impacts to the floodplain, please see FEIS Appendix FF, Responses to Comments 2.5.2, 2.5.27, 2.5.30, 2.5.31, 2.5.32, 2.5.33, 2.5.43, 2.5.45, and 2.5.46. As noted in Responses to Comments 2.5.2 and 2.5.45, the proposed commercial development area under the proposed project would be located within Zone X, which is considered a 500-year floodplain, although shallow flooding could occur during a 100-year flood. FEIS Appendix C and Sections 4.3 and 4.12 fully analyze potential flooding impacts, even during a 500-year storm event.

Regarding mitigation for stormwater and flood storage impacts, Response to Comment 2.5.2 includes the following response:

“As stated in **Appendix C** of the FEIS, Alternatives A and H have been revised to include two detention basins (as is proposed in the DEIS for Alternatives B-E). The first detention basin would be located on the northeastern corner of the site near the development area and would be sized to limit the post project runoff due to the new impervious areas to the pre-project peak runoff levels. The second detention basin is located in the southern portion of the site in an area bounded by the Bellevue-Wilfred Channel on the West, Hinebaugh Creek on the East and Rohnert Park Expressway on the South. This basin is sized to more than offset the encroachment in the Zone X non-regulated floodplain by the proposed fill.”

The FEIS currently addresses the impacts of all proposed development to wetland areas (see FEIS Sections 4.5 and 4.12). As noted in FEIS Sections 4.5 and 5.2.4, a U.S. Army Corps of Engineers Clean Water Act Section 404 permit would be required before the fill of any wetlands. Please also see FEIS Appendix FF, Response to Comment 2.7.3 regarding impacts to wetlands. Please see Response to Comment G-1.1 regarding Variant H-sub1, which has a reduced footprint when

compared to the Proposed Project and has been designed to move the wastewater treatment plant to avoid impacts to the wetland area referenced by the commenter.

Please see FEIS Appendix FF, Response to Comment 2.5.11 regarding the irrigation efficiency factors utilized in FEIS Appendix D.

- G-1.19** Mitigation Measure W has been included in Section 6.0 of the ROD which requires its implementation if feasible. As noted by the commenter, the FEIS acknowledges that if full implementation of Measure W is infeasible, a significant and unavoidable impact would remain. Thus, the FEIS is not relying on this measure to reduce potentially significant air quality impacts to a less than significant level if it proves to be infeasible to implement. Please see Response to Comment G-1.1 regarding Variant H-sub1, which would result in reduced impacts to air quality.

Regarding the potential emissions of diesel particulate matter (DPM), please see FEIS Appendix FF, Responses to Comments 2.6.5, 2.6.18, and 2.6.19. As noted in Response to Comment 2.6.5, mitigation recommended by the Bay Area Air Quality Management District (BAAQMD) for emissions of DPM was added to FEIS Section 5.2.3. The BAAQMD CEQA guidelines state that the BAAQMD does not have a recommended methodology for quantifying DPM emission. Also, the BAAQMD, City of Rohnert Park, and the State of California do not have a health risk threshold (level) for DPM; therefore any quantification of DPM emissions would not result in a reasonable assessment of the health risk due to DPM. However, the FEIS does present the risk of DPM impacts and provides mitigation which reduces any potential risk during construction and operation of the Proposed Project; thus, meeting NEPA requirements.

- G-1.20** As noted by commenter, a quantitative construction noise assessment was conducted that considered temporary noise impacts at the sensitive receptors (see FEIS Section 4.10.1 and Appendix R). The daytime operational limitation for pile driving, which has the potential to be disruptive to sleep, does not include any feasibility qualification.

Regarding the noise analysis methodology, please see FEIS Appendix FF, Responses to Comments 2.12.6 and 2.12.11. Regarding noise mitigation measures, please see FEIS Appendix FF, Response to Comment 2.12.7. Please see Response to Comment G-1.1 regarding Variant H-sub1, which would result in reduced noise impacts when compared to the Proposed Project.

- G-1.21** Please see FEIS Appendix FF, Responses to Comments 2.22.1, 2.22.2, 2.22.6, and 2.22.8. Please also see Response to Comment G-1.16.

G-2 – UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION IX

- G-2.1** According to the USEPA’s comment letter on the DEIS (FEIS Appendix AA, Letter G-29), “the DEIS did not evaluate a reduced intensity alternative on the Wilfred site, and this is the basis for our ‘2’ rating above.” Thus, the NIGC proceeded to include a full analysis in the FEIS of Alternative H, a reduced intensity alternative on the Wilfred site. It is noted that the USEPA commended the “thoroughness of study, a good range of alternatives, avoidance of wetlands, and substantial mitigation measures.” All mitigation measures contained in the DEIS are included in the ROD.

Several new and expanded mitigation measures were added to the FEIS in response to public comments on the DEIS, including comments by the USEPA. In particular, in response to comments concerning water usage and groundwater impacts, water conservation mitigation measures were added to FEIS Section 5.2.2 that would result in an estimated water savings of 12,800 gallons per day. Mitigation measures were also added to FEIS Section 5.2.2 that include contributions to a water conservation and conjunctive use programs to supplement the City of Rohnert Park’s and the Sonoma County Water Agency’s (SCWA) water conservation and reclamation programs in order to offset groundwater pumping. Please also see FEIS Appendix FF, Responses to Comments 2.5.3, 2.5.4, 2.5.13, 2.5.14, and 2.5.20. Regarding wetland impacts, a mitigation measure was added to FEIS Section 5.2.4 recommending redesigning the parking areas in consultation with the U.S. Army Corps of Engineers (USACE) in order to further reduce wetland impacts (also see FEIS Appendix FF, Response to Comment 2.7.3). Thus, with the mitigation measures added to the FEIS and contained in Section 6.0 of the ROD requiring offsetting of groundwater impacts and further avoidance of wetland impacts, the post-mitigation impacts of Alternative A will be the same or very similar to Alternative H.

Please see Response to Comment G-1.1 regarding Variant H-sub1, which would result in additional reductions to groundwater impacts and biological resources impacts, including wetlands and special status species. For instance, water demand has been reduced by 23 percent from 165 gallons per minute (gpm) under Alternative A to 127 gpm under Variant H-sub1 (note that Alternative H would pump 30 percent less groundwater than Alternative A, at 115 gpm). In addition, in response to this comment, the Variant H-sub1 site plan has been reconfigured with

a smaller surface parking lot and a relocated wastewater treatment plant, resulting in a substantial reduction in impacts to wetlands, including complete avoidance of the wetland areas referenced by the commenter.

- G-2.2** Comment noted. The Tribe plans to continue to aggressively pursue an off-site wastewater treatment connection.
- G-2.3** Please see Response to Comment G-2.5. The understanding of the USEPA noted in this comment is accurate.
- G-2.4** As recommended, a mitigation monitoring and enforcement plan has been included in the ROD (Attachment 6), pursuant to 40 C.F.R. 1505.2(c). Mitigation Measures adopted within the NIGC's ROD for the Preferred Alternative have been incorporated into Section 6.0 of the NIGC's Decision Package. All adopted mitigation measures will be monitored and enforced pursuant to Federal law, tribal ordinances, and agreements between the Tribe and applicable governmental authorities. The Tribe's MOUs are enforceable through the Tribe's grant of a waiver of sovereign immunity which allows the City of Rohnert Park and Sonoma County to seek relief in State Court to enforce both the mitigation provisions and the waiver of sovereign immunity. Finally, NIGC has the authority and ability to enforce the Tribe's gaming regulations with powers that include closure of the gaming operation. Please see Response to Comment G-1.1 regarding Variant H-sub1.
- G-2.5** The commenter correctly states the history of the EPA's action on the current State Implementation Plan (SIP) for 1-hour ozone. However, as stated by the commenter, the SIP emissions inventory that is used in determining conformity was approved by the EPA. Another element of conformity is the attainment status of the region in which the project is being built. Since the EPA action did not approve the attainment demonstration of the region, the assumption of nonattainment is valid and no revisions are required to the FEIS or the conformity determination.
- Regarding the characterization of the 8-hour ozone standard, the conformity determination concludes (as does the commenter) that the status of 8-hour ozone is nonattainment. With respect to the BAAQMD not attaining the new 2008 8-hour ozone standard, the stricter standard would not change the nonattainment status of the region, as assumed in the conformity determination. The analysis and conclusion in the conformity determination would be unaffected since the attainment status would remain unchanged regardless of what standard is used. Please see Response to Comment G-1.1.

The commenter is correct there is a typo regarding 40 CFR 93.155 (d). As assumed by the commenter, the correct reference should be 40 CFR 93.155 (b). However, no revisions to the conformity determination are necessary given that the underlying reference to 40 CFR 93.155 (which does not contain a subpart d) is accurate.

G-3 – CITY OF PETALUMA- WATER RESOURCES AND CONSERVATION DEPARTMENT

G-3.1 Mitigation Measure 5.2.2Y does not propose actually extending a water line to the Lakeville site, but attempting to supplement existing municipal water supplies to ease groundwater pumping pressures in the region. As stated on FEIS page 5-9, after mitigation, Alternative F impacts would be less than significant. Mitigation Measure 5.2.2CC.f. simply requires that well owners be notified of the compensation program for drawdown impacts to their wells so that they will be on notice to seek compensation if they notice an impact to their well caused by pumping of the project. This mitigation requirement and the compensation program described in Mitigation Measure 5.2.2CC are unrelated to potential seawater intrusion impacts. Pursuant to Mitigation Measure 5.2.2CC, a well owner would of course be owed compensation if seawater intrusion caused by Alternative F caused their well to become unusable. However, seawater intrusion is governed by the much more stringent Mitigation Measure 5.2.2AA, which is designed to insure that seawater intrusion does not occur and that if it is found to occur that measures be taken immediately to halt the intrusion. Mitigation Measure 5.2.2 is specific and enforceable in requiring the Tribe to “sign a legally binding agreement, prior to opening the hotel/casino resort to the public, agreeing not to operate their facility in such a way to cause seawater intrusion and agreeing to comply with the terms of a seawater intrusion elimination plan as described above should signs of seawater intrusion be detected.” The seawater intrusion elimination plan includes monitoring and consultation with the San Francisco Bay Regional Water Quality Control Board, the U.S. Geological Services, and Sonoma County.

G-4 – NATIVE AMERICAN HERITAGE COMMISSION

G-4.1 Comment noted.

G-5 – CITY OF PETALUMA – COMMUNITY DEVELOPMENT DEPARTMENT

- G-5.1** Regarding impacts to US-101, Lakeville Highway, and the Old Redwood Highway interchange, please see FEIS Appendix FF, Response to Comment 2.11.3. Regarding impacts to Stony Point Road, please see FEIS Appendix FF, Responses to Comments 2.11.4, 2.11.5, 2.11.19, and 2.11.25. Regarding the concerns stated by Sonoma County regarding US-101 mitigation, please see Response to Comment G-1.5. The commenter's preference for the selection of a reduced intensity alternative is noted for the record. Regarding the reduction of traffic impacts under Variant H-sub1, please see Responses to Comments G-1.1 and G-1.2.

G-6 – CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

- G-6.1** Comment noted. Please see FEIS Appendix FF, Response to Comment 2.11.6.
- G-6.2** Regarding the consideration of bottleneck effects on US-101, please see FEIS Appendix FF, Response to Comment 2.17.6. Contributions to planned improvements to US-101 are included in FEIS Section 5.2.7. FEIS Section 5.2.7 also includes alternative mitigation measures should additional traffic lanes on US-101 prove to be infeasible. Regarding the reduction of traffic impacts under Variant H-sub1, please see Responses to Comments G-1.1 and G-1.2.
- G-6.3** Comment noted.

G-7 – OFFICE OF THE GOVERNOR – LEGAL AFFAIRS

- G-7.1** Please see FEIS Appendix FF, Response to Comment 2.2.10.
- G-7.2** Please see FEIS Appendix FF, Responses to Comments 2.13.9, 2.13.11, and 2.20.2. Legal Affairs Secretary Andrea Hoch raised the question in her May 1, 2006, letter to Andrea Lord, Staff Attorney, NIGC, whether the Williamson Act contract restrictions have been addressed. They have. As Ms. Hoch accurately observed, "the portion of the property on which the Tribe proposes to build the gaming facility is not subject to a Williamson Act contract, . ." The land that is subject to the Williamson Act will remain subject to the Williamson Act after the land is in trust. On February 14, 2009, the Tribe adopted General Council Resolution 09-03-GC which committed the Tribe to "comply with the land use restrictions of the Williamson Act for those land that are subject to a Williamson Act . . . until such time, if ever, that the Williamson Act contract term expires; . . ." To ensure the enforceability of this commitment, the Tribe also "expressly grants a limited

waiver of sovereign immunity in favor of the County of Sonoma” for Williamson Act enforcement purposes (see ROD Attachment 1).

G-8 – CITY OF PETALUMA

- G-8.1** Comment noted. Please refer to Response to Comment G-1.1.
- G-8.2** Please refer to Response to Comment G-3.1 for responses to similar comments received in the March 24, 2009 City of Petaluma Water Resources and Conservation Department letter.
- G-8.3** Please refer to Response to Comment G-5.1 for responses to similar comments received in the March 26, 2009 City of Petaluma Community Development Department letter.

G-9 – RINCON VALLEY FIRE PROTECTION DISTRICT

- G-9.1** Please see Response to Comment G-1.10.

G-10 – CALIFORNIA GOVERNOR’S OFFICE OF PLANNING AND RESEARCH

- G-10.1** Please see Response to Comment G-4.1, as the comment letter from the Native American Heritage Commission was received on March 10, 2009.

G-11 – UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION IX

- G-11.1** Despite the environmental benefits of Variant H-sub1 when compared to Alternative A and even when compared to some aspects of Alternative H, the NIGC agrees that Alternative H along with the No Action Alternative remain the environmentally preferable alternatives per 40 C.F.R. 1505.2(b). Although Alternatives D and H are reasonable alternatives, they are less financially viable than Alternative A or Variant H-sub1, particularly in light of the current economic recession.
- G-11.2** Comment noted.
- G-11.3** With the exception of a few mitigation measures which are not applicable to Variant H-sub1, all mitigation measures recommended for Alternative A have been included in the ROD. Regarding the development of a mitigation monitoring and enforcement plan, please see Response to Comment G-2.4. As stated at the April

28, 2009 meeting, the Tribe's intent remains to utilize recycled water whether wastewater treatment occurs on-site or off-site (this is also required by FEIS Section 5.2.2). This commitment is not needed in the ROD for Variant H-sub1, however, for it does not include an off-site wastewater treatment option. Regarding Williamson Act protections, please see Response to Comment G-7.2. Finally, a mitigation measure has been added to Section 6.11 of the ROD, requiring that the Tribe pursue LEED certification for the hotel component of the project.

G-12 – JARED HUFFMAN, CALIFORNIA ASSEMBLYMEMEBER

- G-12.1** Please see Response to Comment B-6.1. As noted in the Biological Opinion (FEIS Appendix JJ), California Tiger Salamander habitat would be impacted only on portions of the site proposed for development and outside of the 100-year floodplain, not the entire site. Note further that impact to habitat does not equate to the incidental taking of salamanders. The Biological Opinion contains measures that would minimize the taking of salamanders during construction on-site.

BUSINESS AND NON-GOVERNMENT AGENCY COMMENTS

B-1 – STOP THE CASINO 101

- B-1.1** Please see Responses to Comments G-1.1 through G-1.21.
- B-1.2** Regarding the adequacy of mitigation and the applicability of the California Environmental Quality Act (CEQA), please see FEIS Appendix FF, Responses to Comments 2.2.9, 2.5.48, 2.7.11, 2.11.44, and 2.16.3.
- B-1.3** The Bellevue-Wilfred Channel is typically referred to as a flood control channel, but it has many uses, one of which is to convey drainage from agricultural operations throughout the region, including the Wilfred and Stony Point Sites. Regarding the use of fertilizers, please see FEIS Appendix FF, Response to Comment 2.5.9.
- B-1.4** Responses to Comments on the DEIS submitted by the O.W.L. Foundation and the USEPA are contained in FEIS Appendix FF. In addition, please see Response to Comment G-2.1.

- B-1.5** Please see FEIS Appendix FF, Responses to Comments 2.5.1, 2.5.3, 2.5.4, 2.5.20, and 2.16.3. Additional groundwater mitigation measures were added to FEIS Section 5.2.2 in addition to the one measure cited by the commenter. The timing provisions in Mitigation Measure 5.2.2CC are appropriate because this mitigation measure is meant to mitigate for impacts to surrounding wells caused by interference drawdown. Interference drawdown caused by the Proposed Project will not increase over time. Groundwater levels may decrease over time, however due to other factors such as the operation of neighboring agricultural wells. The timing restriction ensures a nexus between the mitigation measure and the impact of the on-site well operation. In order to demonstrate an impact caused by the pumping of the Tribe's well, a baseline groundwater elevation at a neighboring well must be established prior to the operation of the Tribe's well. Please see Response to Comment G-2.1 regarding the reduced groundwater impacts of Variant H-sub1.
- B-1.6** Please see FEIS Appendix FF Responses to Comments 2.5.11 and 2.5.23.
- B-1.7** Please see FEIS Appendix FF, Responses to Comments 2.2.2, 2.2.5, 2.2.6, 2.2.7, and 2.2.8.

B-2 – ALAN TITUS, ROBB & ROSS

- B-2.1** Please see FEIS Appendix FF, Responses to Comments 2.2.9, 2.2.10, and 2.2.15. The Erie County decision does not require that issues of jurisdiction be settled prior to the NEPA analysis, which as noted in the Appendix FF responses referenced above, would be contrary to the basic requirements of NEPA. Instead, the decision holds that issues of jurisdiction be settled prior to agency action (in Erie County the action at issue was approval of a Gaming Ordinance). The NIGC will issue a ROD on the FEIS only after making a final agency determination on the Tribe's management contract with SC Sonoma Management LLC pursuant to IGRA. As part of a determination to approve the contract, the NIGC must determine that the gaming contemplated under the contract will occur on Indian lands over which the Tribe exercises jurisdiction. The NIGC must further determine that such Indian lands would be eligible for the gaming contemplated under the contract pursuant to Section 20 of IGRA. Thus, in taking final agency action to approve the management contract, the NIGC must properly consider "the applicability of Section 20 of the IGRA" and provide "an explanation of the basis for its determinations." *Citizens Against Casino Gaming in Erie County v. Kempthorne*, 471 F.Supp.2d 295, 327 (2007).

In his April 18, 2008 determination letter to take the lands comprising the Wilfred Site into trust for the Tribe (see ROD Attachment 2), the Assistant Secretary of Indian Affairs explained that “[a] determination on whether the property to be acquired will be eligible for gaming under the Indian Gaming Regulatory act (IGRA) has not been made because such a determination is unnecessary when the Secretary’s decision on whether to acquire the land in trust is not discretionary, but mandated by an act of Congress.” The Memorandum of Understanding between the National Indian Gaming Commission and the Department of the Interior referenced by the commenter was (i) not in effect at the time of the decision, (ii) did not contemplate a mandatory trust acquisition; and (iii) provided a mechanism for the BIA to refer Indian lands requests to NIGC and vice-versa. Finally, the law does not support commenter’s contention that the state would continue to exercise jurisdiction over land use and gambling on lands acquired for the Tribe pursuant to the Graton Rancheria Restoration Act. Once in trust, the lands will become part of the Tribe’s reservation pursuant to that Act. 25 U.S.C. § 1300n-3(c). The state does not exercise civil regulatory jurisdiction over land use and gambling on reservations in California. *See California v. Cabazon Band of Mission Indians*, 480 U.S. 202, 214 and 222 (1987).

B-3 – DAVID GRUNDMAN, RECLAIMING OUR ENVIRONMENTAL RIGHTS (ROER)

B-3.1 NEPA does not require that a printed version of the FEIS be made available for public review. Nonetheless, printed versions of the FEIS were made available at the Rohnert Park - Cotati Regional Library and at the Santa Rosa Central Library. Furthermore, the FEIS was made available at <http://www.gratoneis.com> a little over a week prior to the publication of the Notice of Availability in the federal register by the NIGC and USEPA (a CD and a copy of the notice was also mailed out to all interested parties at that time). Thus, an electronic version of the FEIS was made available for review for greater than 30 days. Regarding the formatting of the CD, please see FEIS Appendix FF, Response to Comment 2.1.3. Comments on water supply, wastewater, solid waste, police, and fire are responded to as addressed in detail, below.

B-3.2 As summarized in FEIS Section 2.2.8, “Elements of the proposed on-site water facilities include two on-site wells (one for continuous supply and one for redundancy in case of malfunction or maintenance of the primary well), an iron and manganese treatment plant, a steel water storage tank, and a water distribution pump system.” FEIS Section 2.2.8 also makes clear that the City of Rohnert Park would not supply water to the proposed project. Regarding the City of Rohnert

Park's ability to ramp up production of its water supply wells in the future, please see FEIS Appendix FF, Response to Comment 2.5.48. Regarding the potential for the on-site wells to cause the migration of groundwater MTBE plumes, please see FEIS Appendix FF, Responses to Comments 2.5.7, 2.5.12, and 2.21.4. Please see Response to Comment G-2.1 regarding the reduced groundwater impacts of Variant H-sub1.

B-3.3 Comment noted. Note that under the Variant H-sub1, sprayfield disposal areas and seasonal storage ponds would be reduced in size and no wastewater discharge into the Laguna de Santa Rosa would occur. Please see Response to Comment G-1.1.

B-3.4 A change in the Sonoma County solid waste-recycling rate does not impact the analysis within the FEIS. Solid waste impacts are discussed in Section 4.9 of the FEIS. The FEIS states that solid waste generation would be considered an insignificant contribution to the waste stream. Mitigation measures B through I in Section 5.2.8 of the FEIS have been created to provide methods of on-site waste reduction during construction and operation. Please see Response to Comment G-1.1.

B-3.5 The analysis of the demand for fire protection services would not change regardless of the need for additional services in the community. The FEIS Section 4.9 includes an analysis of this demand and Sections 5.2.6 and 5.2.8 include mitigation measures that would ensure that this demand is fully mitigated regardless of the other demands placed on the local fire department. Please see Response to Comment G-1.1.

B-3.6 The FEIS provides a thorough and accurate discussion of impacts to law enforcement services in Sections 4.9, 4.11, and 4.12. Refer to FEIS Section 5.2.6 (A and B) of the FEIS for a discussion of ongoing payment and MOU agreements regarding law enforcement impacts. Section 5.2.8 Mitigation Measures P through Z provide specific law enforcement provisions. Please refer to FEIS Appendix FF, Response to Comments 2.9.2 for a response to impacts of crime.

Appendix N, Section 4.7 and Section 4.9 of the FEIS states that, absent an agreement stating otherwise, the Sonoma County Sheriff's Department would provide law enforcement services to the development of federal trust land per Public Law 83-280 (18 U.S.C. § 1162, 28 U.S.C. § 1360).

B-3.7 Please see Responses to Comments B-3.1 through B-3.6.

B-4 – STOP THE CASINO 101

B-4.1 It is not clear why the commenter believes that their earlier comments on the DEIS were not answered in detail or in writing pursuant to the requirements of NEPA. As explained in FEIS Appendix FF: “Although the National Environmental Policy Act (NEPA) only requires that substantive comments be attached to a Final EIS (40 C.F.R. § 1503.4(b)), all comment letters have been included in Appendices AA – EE. Each comment was assessed and considered both individually and collectively. Substantive comments are summarized below by issue area. Responses to each summarized comment are also included below.” Thus, all substantive comments were summarized by issue area and responded to in detail in FEIS Appendix FF (which is over 400 pages in length). The responses to comments contained in the FEIS fully meet the requirements for NEPA responses in the CEQ NEPA Regulations (40 CFR 1503.4).

B-4.2 Please see Responses to Comments B-1.7 and B-2.1.

B-5 – STOP THE CASINO 101

B-5.1 Please see FEIS Appendix FF, Response to Comment 2.11.6.

B-6 – STOP THE CASINO 101

B-6.1 Please see FEIS Appendix FF, Responses to Comments 2.7.1 and 2.7.9. FEIS Section 3.5 acknowledges the presence of California Tiger Salamander (CTS) habitat on the Wilfred Site, as does the Biological Opinion (BO), which was issued by the U.S. Fish & Wildlife Service (USFWS) in compliance with Section 7 of the Endangered Species Act on February 3, 2009 (see FEIS Appendix JJ). The BO recounts the litigation history of the legal action cited by the commenter in detail. The Tribe is required to comply with the requirements of the Endangered Species Act independent of any NEPA requirements. Therefore, CTS mitigation will be undertaken pursuant to the requirements of the Endangered Species Act, as directed by the USFWS.

Regarding the comment that the NIGC should wait to issue a ROD until a critical habitat map is delineated and presumably a supplemental NEPA document can be prepared, please see Response to Comment G-1.1. The FEIS Section 4.5 acknowledges that a significant impact to CTS would occur. Even if a portion of the Wilfred Site were designated as critical habitat, this would not constitute significant new information requiring the supplementation of the FEIS. NEPA does not require that lead agencies withhold decisions on proposed actions in order

to wait for information that may not be available at the time that the decision is to be made (40 C.F.R. 1502.22).

INDIVIDUAL COMMENTS

I-1 – PAUL D. STUTRUD

- I-1.1** In response to commenter concerns regarding an allegedly deficient FEIS CD and issues regarding the number of FEIS copies at the Rohnert Park – Cotati Regional Library, a printed copy of the FEIS was sent to Mr. Paul D. Stutrud. However, due to the limited production of printed copies due to the high cost of production, an additional printed copy was not sent to the commenter’s attorney, as requested. However the commenter’s attorney, John F. Hudson, was sent a CD copy of the FEIS.

I-2 – EUNICE EDGINGTON

- I-2.1** Please see FEIS Appendix FF, Responses to Comments 2.2.2, 2.2.5, 2.2.6, 2.2.7, and 2.2.8. Please also see Responses to Comments B-1.7 and B-2.1. The commenter is misinterpreting the Carcieri decision, which does not apply to the Department of the Interior’s decision to take land into trust for the benefit of the Tribe. The Carcieri decision applies to actions by the Department of the Interior to take land into trust under the Indian Reorganization Act of 1934 (25 U.S.C. 461 et seq.). *Carcieri v. Salazar*, 129 S. Ct. 1058 (2009). The Carcieri decision does not apply to actions mandated by Congress under the Graton Rancheria Restoration Act (25 U.S.C. 1300n et seq.).

Regarding the Tenth Amendment comment, a decision to take the land into trust would not violate the Constitution. The Tenth Amendment provides that “powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.” (U.S. Const. amend. X) Since the power to regulate Indians affairs has been directly delegated to Congress by the Constitution, the acquisition of land for the benefit of a tribe does not violate the Tenth Amendment. See, e.g., *Cotton Petroleum Corp. v. New Mexico*, 490 U.S. 163, 192 (1989) (“The central function of the Indian Commerce Clause is to provide Congress with plenary power to legislate in the field of Indian affairs.”); see also *New York v. United States*, 505 U.S. 144, 156 (1992) (“If a power is delegated to Congress in the Constitution, the Tenth Amendment expressly disclaims any reservation of that power to the States . . .”).

I-3 – MARILEE MONTGOMERY

- I-3.1** The commenter has been sent all letters requested. Individual comments received from the non-profit group, Laguna de Santa Rosas Foundation, are included for public reference at the Graton NEPA website located at <http://www.gratoneis.com>. Comments received during the scoping periods can be found in the Scoping Report (August 2004), the Supplemental Scoping Report (February 2006), and comments received during the DEIS comment period are located in the FEIS, all of which are also available for public reference at the Graton NEPA website.

I-4 – DAN MONTE

- I-4.1** An analysis of potential impacts to climate change from greenhouse gas emissions is included within FEIS Sections 4.4 and 4.12. Mitigation Measures BBB through JJJ within FEIS Section 5.2.3 shall provide for project design features and prevention methods to decrease project related greenhouse gas emissions. Please also see FEIS Appendix FF, Response to Comment 2.6.2. Regarding Variant H-sub1 and the accuracy of the trip generation estimates in the FEIS, please see Response to Comment G-1.2.
- I-4.2** Commenter concerns regarding the potential for negative impacts to local businesses have been analyzed in the FEIS Sections 3.7 and 4.7, as well as responded to in FEIS Appendix FF, Response to Comment 2.9.5. Analysis of project related crime and law enforcement provisions are within FEIS Sections 4.7, 4.9, and 4.12. Responses to similar comments can be found in FEIS Appendix FF, Responses to Comments 2.9.2, 2.9.8, 2.9.10, 2.9.14, 2.9.24, and 2.10.6. Responses to comments regarding the potential for traffic impacts along Petaluma Hill Road and Stony Point Road are located within FEIS Appendix FF, Responses to Comments 2.11.4, 2.11.18, and 2.11.46.

Analysis of the California Tiger Salamander and other native biological species can be found in FEIS Sections 3.5 and 4.5, with specific responses to previous comments found under FEIS Appendix FF, Responses to Comments 2.7.1 through 2.7.21. Analysis on area groundwater resources can be found in FEIS Sections 3.3 and 4.3. Please also see FEIS Appendix FF, Responses to Comments 2.5.1, 2.5.3, 2.5.4, and 2.5.5.

Regarding reduced environmental impacts under Variant H-sub1, please also see Responses to Comments G-1.1, G-1.2, and G-2.1. Variant H-sub1 would also result in reduced impacts to the California Tiger Salamander.

I-5 – LINDA M. LONG

- I-5.1** As stated in FEIS Appendix FF, Response to Comment 2.11.2, “The traffic study and DEIS relied on traffic forecast information provided by the Sonoma County Transportation Authority and Caltrans which was considered to be sources for the most reliable data, including at the Wilfred Interchange. Additional information regarding the Wilfred Interchange project was obtained from Caltrans including the Initial Study and Environmental Assessment, and subsequent revisions to the planned design. All have been incorporated into the analysis. Data from other sources was considered to be second hand and less comprehensive.”

FEIS Appendix FF, Response to Comment 2.11.20 includes responses to Ms. Long’s comments regarding the need for an expanded range of traffic analysis.

Regarding the reduced size and traffic impacts of Variant H-sub1, please see Responses to Comments G-1.1 and G-1.2.

ATTACHMENT 6

Mitigation Monitoring and Enforcement Plan

GRATON RANCHERIA CASINO AND HOTEL PROJECT

MITIGATION MONITORING AND ENFORCEMENT PLAN

INTRODUCTION

The Council on Environmental Quality (CEQ) directs all federal agencies to include in an Environmental Impact Statement (EIS) the appropriate means to mitigate any adverse environmental impacts (40 C.F.R. 1502.16(h)). CEQ also requires that a Mitigation Monitoring and Enforcement Plan (MMEP) be adopted and summarized in the Record of Decision (ROD) (40 C.F.R. 1505.2(c)). The National Indian Gaming Commission (NIGC) is the lead agency for National Environmental Policy Act (NEPA) compliance purposes. Mitigation Measures adopted within the NIGC's ROD for the Preferred Alternative have been incorporated into this MMEP in a manner consistent with the CEQ NEPA Regulations and with the draft CEQ Guidance for NEPA Mitigation and Monitoring issued on February 18, 2010.

MITIGATION MONITORING OVERVIEW

This MMEP has been developed to guide mitigation compliance before, during, and after implementation of the NIGC's Preferred Alternative. The mitigation measures described below in **Table 1** were developed through the analysis of potential impacts within the Final EIS (FEIS) and in ROD Attachment 3. As specified in **Table 1**, responsibility for ensuring compliance with mitigation measures lies with various agencies, including the NIGC, United States Fish and Wildlife Service (USFWS), United States Army Corps of Engineers (USACE), California Department of Transportation (Caltrans), and the United States Environmental Protection Agency (USEPA) as indicated in the description of each measure. The MMEP provides:

- Requirements for compliance of the mitigation measures specifically created to mitigate impacts;
- Identification of responsible parties;
- Identification of implementing party;
- Timing of mitigation measure implementation.

Where applicable, mitigation measures will be monitored and enforced pursuant to Federal law, tribal ordinances, and agreements between the Tribe and appropriate governmental authorities, as well as the ROD. Requests for mitigation status updates will be responded to consistent with the requirements of the CEQ NEPA Regulations.

TABLE 1

MITIGATION MONITORING AND ENFORCEMENT PROGRAM FOR THE PREFERRED ALTERNATIVE

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<i>Geology and Soils</i>			
<p>A. The following mitigation measures shall be implemented to result in a less than significant impact to the development from expansive soils:</p> <ul style="list-style-type: none"> a. For structures with a light to moderate bearing load (one to three stories), a shallow, spread footing foundation system would be sufficient to provide support under expansive soil conditions (see FEIS Appendix K for more details and optional systems). However, a shallow foundation system shall be designed to reduce the potential for seasonal moisture variation under the buildings by providing continuous perimeter strip footings that extend below the depth of seasonal moisture variation (typically 18 inches or deeper). b. For structures with a high bearing load, either a post-tensioned concrete slab, or heavily reinforced structural mat slab (shallow foundation systems), or a deep foundation system such as a drilled piers would be necessary to provide support under expansive soil conditions (see FEIS Appendix K for more detail). Shallow system designs applied to high bearing load structures will also be designed to reduce the potential for seasonal moisture variation. c. To mitigate impacts to pavement caused by expansive soil, one or a combination of the following measures shall be required: <ul style="list-style-type: none"> i. Removal and replacement with non-expansive soils. ii. Lime treatment of soils. iii. Design of pavement sections to withstand potential swelling pressures. 	NIGC	Tribe	Planning Phase Construction Phase
<p>B. All structures shall be designed in compliance with the California Building Code (CBC) Building Code (Article VI Chapter 6.04) current at the start of construction such that risks to the health or safety of workers or members of the public from earthquake hazards are reduced to a less-than-significant level.</p>	NIGC	Tribe	Planning
<i>Water Resources</i>			
<p>A. During construction, surface water quality shall be protected by using BMPs as listed in the Erosion Control recommendations found in FEIS Appendix C. These BMPs would be included in the Stormwater Pollution Prevention Plan (SWPPP) to be filed with the USEPA.</p>	USEPA	Tribe	Planning Construction
<p>B. A stormwater sampling and monitoring program shall be developed and implemented to assess the quality of surface water entering and leaving development sites. At a minimum, sampling sites shall include: a location upstream at an elevation above all proposed development; and a location downstream of all development, yet at an interception point prior to surface waters entering the Laguna de Santa Rosa. Analyses shall include total suspended solids (TSS), oils</p>	USEPA NIGC	Tribe	Planning Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
and grease.			
C. Application of fertilizer shall be limited to the minimum amount necessary and shall be adjusted for the nutrient levels in the water used for irrigation. Fertilizer shall not be applied immediately prior to anticipated rain.	USEPA NIGC	Tribe	Operation Phase
D. The garbage bin area shall be covered. Any runoff or drainage from the garbage bin area shall be directed to the sewer system and treated by the WWTP.	USEPA NIGC	Tribe	Planning Construction Operation
E. Landscape irrigation shall be adjusted based on weather conditions and shall be reduced or eliminated during the wet portion of the year in order to prevent excessive runoff.	NIGC	Tribe	Planning Construction Operation
F. In order to maintain the water balance described in Section 4.3.1 of the FEIS, a minimum of 50 gallon per minute (gpm) of treated wastewater shall be designated for use by the casino and hotel.	NIGC	Tribe	Planning Construction
G. The WWTP shall be staffed with operators who are qualified to operate the plant safely, effectively, and in compliance with all permit requirements and regulations. The operators shall have qualifications similar to those required by the State Water Resources Control Board Operator Certification Program for municipal wastewater treatment plants. This program specifies that for tertiary level wastewater treatment plants with design capacities of 1.0 million gallons per day (MGD) or less, the chief plant operator must be a Grade III operator. Supervisors and Shift Supervisors must be Grade II operators. An Operations and Maintenance Program must be followed by the plant operators. Emergency preparedness shall include all appropriate measures, including a high level of redundancy in the major systems.	NIGC USEPA	Tribe	Planning Construction Operation
H. Existing on-site wells shall be abandoned and sealed. On the Wilfred Site, two wells shall be abandoned and capped.	USEPA BIA	Tribe	Planning Construction
I. In order to offset the groundwater used by implementation of the project, the Tribe shall implement one or more of the following measures:	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>a. The Tribe shall work with the City of Rohnert Park and Sonoma County Water Agency (SCWA) to allocate and deliver more surface water, aiding in the City's compliance with the City's settlement with the South County Resource Preservation Committee.</p> <p>b. The Tribe may work with and compensate the City and/or SCWA to implement a water conservation program and/or a conjunctive water use program. The program shall (1) assess existing and potential sources of reclaimed wastewater within SCWA's service area, and determine potential points of use for the reclaimed wastewater, and/or (2) supplement the City's and/or SCWA's existing water conservation programs to identify and implement additional conservation measures within City and/or SCWA service areas. The program(s) shall incorporate reclaimed water use and/or conservation to an extent that would completely offset groundwater pumping associated with the selected project Alternative.</p> <p>c. The Tribe shall participate in the creation of or create an off-site artificial recharge project, such as purchasing a groundwater well in the sub-basin and retiring the well from service in order to offset a portion of the groundwater used by implementation of the project (in lieu recharge).</p>		<p>City of Rohnert Park</p> <p>SCWA</p>	<p>Construction</p>
<p>J. The Tribe shall cooperate with the conduct of the ongoing Joint USGS/SCWA Study of the Santa Rosa Plain Groundwater Sub-basin by providing its Groundwater Study and any aquifer testing and monitoring data compiled during the EIS mitigation phase. In addition, the Tribe shall join other stakeholders in participating in the <i>Cooperative Agreement to Provide Funding and Support Information for Santa Rosa Plain Groundwater Study</i> for Years 4 and 5 of the study and future supplemental studies, subject to the agreement of the other stakeholders in the Tribe's participation. If added to the agreement, the Tribe shall provide funding of an equitable share that is proportionate with other participating non-tribal stakeholders, and that considers its fraction of the municipal groundwater demand in the Santa Rosa Plain Groundwater Basin (currently about 1.8%). In addition, the Tribe shall participate in the identification and implementation of reasonable measures or action plans developed through the study, in the same manner as participating non-tribal stakeholders, and in proportion to its contribution to any basin decline identified by the study.</p>	<p>NIGC</p>	<p>Tribe</p> <p>USGS</p> <p>SCWA</p>	<p>Planning</p> <p>Construction</p> <p>Operation</p>
<p>K. As part of the Tribe's MOU with the City of Rohnert Park, the Tribe will contribute to help establish or support ongoing water conservation measures city-wide in Rohnert Park.</p>	<p>City of Rohnert Park</p>	<p>Tribe</p> <p>Rohnert Park</p>	<p>Planning</p> <p>Construction</p> <p>Operation</p>
<p>L. Water conservation measures including use of reclaimed water for landscape watering, cooling tower makeup water, and toilets shall be implemented. In addition, the following water conservation measures shall be adopted (resulting in a water savings of approximately 12,800</p>	<p>NIGC</p>	<p>Tribe</p>	<p>Planning</p>

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>gallons per day for the full size casino/hotel alternatives):</p> <ol style="list-style-type: none"> Check steam traps and ensuring return of steam condensate to boiler for reuse. Limit boiler blowdown and adjusting for optimal water usage. Use low flow faucets and/or aerators in casino and hotel. Use low flow showerheads in hotel. Encourage voluntary towel re-use by hotel guests. Use pressure washers and water brooms instead of hoses for cleaning. Use garbage disposal on-demand in restaurant. Incorporate a re-circulating cooling loop for water cooled refrigeration and ice machines in restaurants. Serve water to customers only upon request at restaurants. Use air-cooled units in central plant. Use low volume spray rinse valve for pre-cleaning dishes. Use low volume dishwasher. Operate dishwashers with full loads only. Use high pressure/low flow spray rinsers with automatic shut off for pot washing. Reuse dishwasher wastewater for low-grade purposes such as pre-washing and garbage disposals. Use self-contained (connectionless) vegetable steamers. Reduce flow to minimum necessary in scrapper troughs, wash down, and frozen food thawing. Use air-cooled ice machines. 			<p>Construction</p> <p>Operation</p>
<p>M. The Tribe shall implement a groundwater monitoring program preceded by a pump test (see FEIS Appendix G for a detailed description of the recommended pump test and monitoring program) as soon as feasible after project approval and preferably at least one year before opening of the project facilities to the public (to allow for baseline monitoring). The pump test shall include at least one shallow monitoring well located in close proximity to the Laguna de Santa Rosa in order to verify that pumping associated with the Preferred Alternative will not affect the Laguna de Santa Rosa.</p>	<p>NIGC</p> <p>USEPA</p>	<p>Tribe</p>	<p>Planning</p> <p>Construction</p> <p>Operation</p>
<p>N. The Tribe shall implement a program to compensate neighboring well owners for impacts to well operation based on interference drawdown caused by project pumping. The actual amount of interference drawdown associated with the project shall be estimated from the proposed pumping test and groundwater level monitoring program (see above and FEIS Appendix G). At least one year of baseline data and one year of data after project pumping begins should be collected prior to implementation of the following well impact compensation program:</p> <ol style="list-style-type: none"> Well Usability (Impacts 1 and 2) – The tribe shall reimburse the owners of wells that become unusable within three years of the onset of project pumping for a portion of the prevailing, customary cost for well replacement, rehabilitation or deepening. The mitigation method for which reimbursement is made shall be the lowest-cost customary and reasonable method to restore the lost well capacity. The percentage of the cost reimbursed by the tribe shall 	<p>NIGC</p>	<p>Tribe</p>	<p>Planning</p> <p>Construction</p> <p>Operation</p>

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>depend upon the degree to which the impact is caused by project pumping vs. pumping by other wells. Reimbursement shall be for replacement in-kind; that is, for a well of similar construction, but deepened so as to restore the lost well capacity. A depreciation allowance shall be subtracted from the reimbursement amount for wells or pumps that have condition issues. In order to be eligible, the well owner must provide the Tribe with documentation of the well location and construction (diameter, depth, screened interval, pump type, etc.), and that the well was constructed and usable before project pumping was initiated.</p> <p>b. Diminished groundwater level near or below pump intake (Impact 3) – The Tribe shall reimburse the owners of wells with pumps that require lowering within three years of the onset of project pumping for a portion of the prevailing, customary cost for this service. The percentage of the cost reimbursed by the Tribe shall take into consideration the degree to which the impact is caused by project pumping vs. pumping by other wells, and the degree to which a well's capacity may have been reduced in the absence of project pumping due to shallow placement of the pump intake. Replacement discharge piping shall not be reimbursed, and replacement of pumps shall not be reimbursed unless the pump was damaged due to project-related interference drawdown. In order to be eligible, the well owner must provide the Tribe with documentation of the well location and construction, including pump intake depth, and that the well was constructed and usable before project pumping was initiated. The Tribe must be made aware of the cost reimbursement claim prior to lowering of the pump intake, so that the need for possible well deepening, replacement or rehabilitation can be assessed. At the Tribe's discretion, compensation may be paid toward well deepening, replacement, or rehabilitation in lieu of toward lowering the pump intake.</p> <p>c. Increased Electrical and Maintenance Cost (Impact 4) – The Tribe shall reimburse well owners pumping more than 100 acre-feet/year for their additional annual electrical costs at the prevailing electrical rate based on the following formula:</p> <p>KW/hr/year = $\frac{\text{gallons Pumped/year} \times (\text{feet of interference drawdown})}{1,621,629}$</p> <p>In order to qualify for reimbursement, the well owner must provide proof of the actual annual volume of water pumped and/or the electrical usage associated with the pumping. As an alternative to annual payments, a one-time lump sum payment of a mutually agreeable amount could be made.</p> <p>d. No reimbursement would be made available for wells installed after operation of the project wells commences.</p> <p>e. For any of the above impacts, the Tribe may choose at its discretion to provide the well owner with a connection to a local public or private water supply system in lieu of the above mitigation measures, at reduced cost in proportion to the extent the impact was caused by project pumping.</p> <p>f. The known owners of identified wells within two miles of the project pumping well(s) shall be</p>			

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>notified of the well impact compensation program outlined above before project pumping begins.</p> <p>g. The Tribe shall contract with a third party, such as Sonoma County, to oversee this well impact compensation program.</p>			
<p>O. The proposed storm water detention basin shall retain a portion of the storm water runoff, where it will percolate into the ground, if possible without compromising primary stormwater flow control objectives.</p>	NIGC	Tribe	<p>Planning</p> <p>Construction</p> <p>Operation</p>
Air Quality			
<p>A. The generation of construction-related PM₁₀ and PM_{2.5} emissions would cause a less-than-significant impact. However, Basic Control Measures and Enhanced Control Measures from Table 2 of the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines - Assessing the Air Quality Impacts of Projects and Plans are recommended as mitigation during construction.</p> <p>a. The Tribe shall designate an on-site Air Quality Construction Mitigation Manager (AQCMM) who shall be responsible for directing compliance with mitigation measures for the construction project.</p> <p>b. Basic Control Measures shall include the following:</p> <ul style="list-style-type: none"> i. Water all active construction areas at least twice daily. ii. Cover all truckloads hauling soil, sand, and other loose materials or require all truckloads to maintain at least two feet of freeboard. iii. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers to all unpaved access roads, parking areas and staging areas at construction sites. iv. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites. v. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. <p>c. Enhanced Control Measures shall include the following:</p> <ul style="list-style-type: none"> i. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). ii. Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.) 	NIGC	Tribe	Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<ul style="list-style-type: none"> iii. Limit traffic speeds on unpaved roads to 15 mph. iv. Install sandbags or other erosion control measures to prevent silt runoff to public roadways. v. Replant vegetation in disturbed areas as quickly as possible. vi. Use of construction entrances to reduce soil/dust transport off-site. vii. Time-staged construction shall be used to avoid dust/open soils. 			
<p>B. The generation of ROG, NO_x, PM₁₀, and diesel particulate matter emissions from construction equipment would cause a less-than-significant impact. However, implementation of the following basic measures are recommended during construction in order to further reduce the effects from construction activities:</p> <ul style="list-style-type: none"> a. To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies b. All diesel-fueled engines used in construction shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel. c. All construction diesel engines, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-ignition engines, unless certified by the AQCMM that such an engine is not available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 (or newer) engines will be used preferentially. Older engines will only be used if the AQCMM certifies that compliance is not feasible. d. All diesel fueled engines used in construction shall have clearly visible tags or other suitable means of identification showing that engine meets the above requirements e. Idle time shall be minimized to five minutes when the equipment is not in use, unless safety requirements or manufacturers specifications indicate that more time is required. f. Heavy duty diesel equipment shall be maintained in optimum running condition. 	NIGC	Tribe	Construction
<p>C. In coordination with the regional transportation agency, such as the Sonoma County Transit, the Golden Gate Transit, and the potential Sonoma Marin Area Rail Transit (SMART) rail, the Tribe shall provide the following to support regularly-scheduled community transit or shuttle service to and from the nearest mutually-acceptable major transit node:</p> <ul style="list-style-type: none"> d. Transit shelter benches, e. Street lighting, 	NIGC	Tribe	<p>Planning</p> <p>Construction</p>

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<ul style="list-style-type: none"> f. Route signs and display, and g. Bus turnouts. 			
<p>D. The Tribe shall implement feasible travel demand management (TDM) measures for a project of this type. These measures shall include, but are not limited to:</p> <ul style="list-style-type: none"> a. Designation of an on-site TDM coordinator. b. Provisions to encourage bicycle commuting. Bicycle lanes and parking areas will be provided wherever appropriate and feasible. c. Provision of transit use incentives, provision of information, printed schedules and commuter promotions. d. Carpool incentives, such as monetary or other rewards will be made available to employees. e. Installation of secure bicycle parking facilities at commercial areas. 	NIGC	Tribe	Planning Construction Operation
<p>E. Buses and other commercial diesel-fueled vehicles shall comply with the California Air Resource Board's (CARB) Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (California Code of Regulations, Title 13, Division 3, Article 1, Chapter 10, Section 2485), which requires that the driver of any diesel bus shall not idle for more than five minutes at any location, except in the case of passenger boarding where a ten minute limit is imposed, or when passengers are onboard. Furthermore, the Tribe shall provide a "Drivers Lounge" for bus and truck drivers to discourage idling.</p>	NIGC	Tribe	Planning Construction Operation
<p>F. Where feasible, the Tribe shall use alternative fuels for casino vehicles.</p>	NIGC	Tribe	Construction Operation
<p>G. The Tribe shall encourage and facilitate the use of 'carpools' for construction workers and facility employees; tour buses for casino patrons to reduce vehicular use and air pollution.</p>	NIGC	Tribe	Construction Operation
<p>H. The Tribe shall maintain all vehicles to manufacturer's specifications.</p>	NIGC	Tribe	Construction Operation
<p>I. The Tribe shall ensure that buildings are oriented to take advantage of solar heating and natural cooling, and use passive solar designs.</p>	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
J. The Tribe shall ensure use of solar, low-emission, central, or tankless water heaters and install wall insulation that shall exceed Title 24 requirements.	NIGC	Tribe	Planning Construction
K. If mechanical ventilation is included in the parking structure design, the exhaust shall be vented in a direction away from inhabited areas. Directing the exhaust away from inhabited areas would reduce the impacts of parking structure-generated CO to a less-than-significant level.	NIGC	Tribe	Planning Construction Operation
L. The Tribe shall ensure that all shift changes occur during non-peak hours.	NIGC	Tribe	Operation
M. A minimum of 20 percent of landscape maintenance equipment used by the Tribe shall be electric and outlets shall be provided on the exterior of all buildings for this use.	NIGC	Tribe	Planning Construction Operation
N. A final Conformity Determination has been issued (see FEIS Appendix W) based upon evidence of conformance with the State Implementation Plan (SIP) for NOX and CO through the purchase of 149 tons of NOX Emission Reduction Credits (ERCs). The ERCs will be purchased in the BAAQMD pursuant to an enforceable contract to purchase the ERCs before the start of construction (see FEIS Appendix W, Addendum 1).	NIGC USEPA	Tribe	Planning
O. Regional air quality impacts would be reduced, but not to a level that is less than significant for ROG, NO _x , or PM ₁₀ with the addition of Mitigation Measures 6.3 A-M. However, with the implementation of Mitigation Measure 6.3N, NO _x impacts are less than significant. With the implementation of Mitigation Measure 6.3P, ROG and PM ₁₀ impact would be less than significant, assuming Mitigation Measure P is cost and technologically feasible and appropriate mitigation programs are available within the air basin (see Table 1). If Mitigation Measure P is not implemented; then a significant and unavoidable impact to air quality would remain.	NIGC	Tribe	Planning Construction Operation
P. One or more of the following measures will be implemented to reduce ROG and PM ₁₀ emissions to less than 15 tons per year and PM _{2.5} to less than 100 tons per year. a. Pave or resurface unpaved roadway(s) or roadway(s) in a deteriorated state within the San Francisco Bay Area Air Basin, which have a minimum daily vehicle count of 100 vehicles. b. Contribute to a program to retrofit residential fireplaces that do not meet USEPA certification	NIGC	Tribe	Planning Construction Operation

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>standards within the San Francisco Bay Area Air Basin.</p> <ul style="list-style-type: none"> c. Purchase low emission buses to replace older municipal or school buses used within the San Francisco Bay Area Air Basin. d. Purchase hybrid vehicles to replace existing governmental fleet vehicles within the San Francisco Bay Area Air Basin. e. Purchase and install on-site or within the San Francisco Bay Area Air Basin; a photovoltaic array, wind powered energy, and/or other form(s) of renewable energy. f. Contribute a fair share percentage to the synchronization of traffic signals within the San Francisco Bay Area Air Basin. g. Purchase Emission Reduction Credits if available from sources within the San Francisco Bay Area Air Basin. 			
<p>Q. The WWTP shall be constructed with comprehensive odor control facilities, including the injection of odor control oxidants at the sewage lift station and construction of a covered headworks with odor scrubber at the WWTP.</p>	NIGC	Tribe	<p>Planning</p> <p>Construction</p>
<p>R. Spray drift from the WWTP or spray disposal field shall be monitored daily during operation by qualified personnel. Spray drift from these two sources shall not be allowed to migrate out of the plant's property boundaries. In the event that spray drift emanating from sprayfield does migrate outside of the property boundaries, operational measures shall be taken to eliminate offsite drift of spray.</p>	<p>NIGC</p> <p>USEPA</p>	Tribe	Operation
<p>S. Spray field irrigation will cease when winds exceed 30 mph.</p>	<p>NIGC</p> <p>USEPA</p>	Tribe	Operation
<p>T. Proposed commercial land uses (e.g., loading docks) that have the potential to emit toxic air emissions shall be located as far away as feasibly possible from existing and proposed sensitive receptors in accordance with CARB's Air Quality and Land Use Handbook. In addition, loading docks will provide refrigeration trucks with electrical outlets. Truck using the loading docks shall not idle for more than five minutes.</p>	NIGC	Tribe	<p>Planning</p> <p>Construction</p> <p>Operation</p>
<p>U. Air intakes associated with the heating and cooling system for buildings shall not be located next to potential TAC-emitting locations (e.g., loading docks) in accordance with CARB's Air Quality and Land Use Handbook.</p>	NIGC	Tribe	<p>Planning</p> <p>Construction</p>

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
V. The Tribe shall ensure that ventilation of outdoor air is consistent with American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Standard 62-1999 ¹ under all operating conditions.	NIGC	Tribe	Planning Construction Operation
W. To limit public exposure to environmental tobacco smoke, the Tribe shall provide non-smoking areas, or "smoke-free zones" in the casino gaming area	NIGC	Tribe	Planning Construction Operation
X. The Tribe shall provide non-smoking rooms in the hotel.	NIGC	Tribe	Planning Construction Operation
Y. The Tribe shall ensure that comfort levels are acceptable to most occupants, and be consistent with ASHRAE Standard 55-1992 ² , under all operating conditions.	NIGC	Tribe	Planning Construction Operation
Z. Signage shall be prominently displayed alerting patrons and employees of areas that permit smoking, noting that environmental tobacco smoke has been found to be deleterious to health, and noting the availability of a brochure(s) describing the health effects of exposure environmental tobacco smoke.	NIGC	Tribe	Operation
AA. A brochure(s) describing the health effects of exposure to environmental tobacco smoke shall be made available to casino patrons in common areas that permit smoking.	NIGC	Tribe	Operation

¹ ASHRAE Standard 62-1999, *Ventilation for Acceptable Indoor Air Quality*, is the generally accepted standard for commercial buildings in the United States.

² ASHRAE Standard 55-1992, *Thermal Environmental Conditions for Human Occupancy*, identifies many factors that influence thermal comfort and the perception of thermal conditions. Among them are temperature, radiation, humidity, air movement, vertical, and horizontal temperature differences, temperature drift, personal activity, and clothing.

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
BB. Prospective employees shall be informed, prior to their hire, that indoor smoking is permitted in portions of the buildings where they may be employed.	NIGC	Tribe	Operation
CC. Prospective employees shall be given a brochure(s) describing the health effects of exposure to environmental tobacco smoke.	NIGC	Tribe	Operation
DD. The Tribe shall ensure that significant expected sources of pollutant emissions are isolated from occupants using physical barriers, exhausts, and pressure controls.	NIGC	Tribe	Planning Construction
EE. The Tribe shall ensure that outdoor air entering the building is protected from contamination from local outdoor sources and from building exhausts and sanitation vents.	NIGC	Tribe	Planning Construction
FF. The Tribe shall ensure that provisions are made for easy access to heating, ventilation, and air conditioning (HVAC) equipment requiring periodic maintenance.	NIGC	Tribe	Planning Construction
GG. The Tribe shall ensure that occupant exposure to construction contaminants is minimized using protocols for material selection, preventive installation procedures, and special ventilation and pressure control isolation techniques.	NIGC	Tribe	Planning Construction Operation
HH. The Tribe shall ensure the use of low-emitting building products pursuant to Integrated Waste Management Board's Section 01350 where feasible.	NIGC	Tribe	Planning Construction
II. The Tribe shall plant trees and vegetation on-site or fund such plantings off-site. The addition of photosynthesizing plants would reduce atmospheric CO ₂ , because plants use CO ₂ for elemental carbon and energy production. Trees planted near buildings would result in additional benefits by providing shade to the building; thus reducing heat absorption, reducing air conditioning needs and saving energy.	NIGC	Tribe	Planning Construction
JJ. The Tribe shall ensure use of solar, low-emission, central, or tankless water heaters and install wall insulation that shall exceed Title 24 requirements.	NIGC	Tribe	Planning Construction
KK. The Tribe shall use energy efficient appliances in the hotel and casino.	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
			Construction
LL. Environmentally preferable materials shall be used to the extent practical for construction of facilities.	NIGC	Tribe	Planning Construction
MM. The Tribe shall install a photovoltaic cell array(s) on the roof of the proposed parking garage and/or the roof(s) of other on-site structures, if feasible. The installation of photovoltaic (PV) on-site would reduce dependence on Pacific Gas and Electric (PG&E) electricity. PV cells convert energy from the sun into electrical energy with no emission of green house gases (GHGs); thus, the indirect GHG emissions would be reduced.	NIGC	Tribe	Planning Construction
NN. The Tribe shall enroll in the ClimateSmart program that is offered to PG&E customs to reduce their indirect GHG emissions form electrical generation to zero. PG&E provides electricity uses with the opportunity to become "carbon neutral" under the ClimateSmart program.	NIGC	Tribe	Planning Construction
OO. The Tribe shall purchase CO2e offsets to reduce or eliminate GHG impacts, where feasible.	NIGC	Tribe	Planning Construction
PP. The Tribe shall increase the recycling goal noted in Mitigation Measure 5.2.8d from 25 to 50 percent.	NIGC	Tribe	Operation
Biological Resources			
A. For impacts to wetlands or other waters of the U.S., authorization from the USACE is required. Replacement of directly affected wetlands will be at a ratio approved by the USACE. Clean Water Act Section 401 water quality certification will also be required from the USEPA.	USACE USEPA	Tribe	Planning Construction
B. Wetland mitigation shall be accomplished through creation/restoration of seasonal wetlands onsite and/or within an open space preserve. This creation/restoration will provide an increase in the inventory of seasonal wetlands for the area. The proposed 1.5:1 ratio of seasonal wetland restoration/creation to impacted acreage is expected to be sufficient to satisfy the ratio of replacement to impacted acreage required by regulatory agencies based on wetland functions and values present on the Wilfred Site. A detailed mitigation plan shall be designed that includes monitoring and reporting requirements, responsibilities, performance success criteria, reporting procedures and contingency requirements.	USACE USEPA	Tribe	Planning Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>C. A plan shall be developed and implemented to conserve ecological resources in the southern portion of the Wilfred Site. The plan shall address management activities to ensure maintenance of breeding, refugial, and dispersal habitats for California tiger salamander (CTS); and should provide a grazing regimen that will conserve populations of Sonoma sunshine and Burke's goldfields. The current mitigation ratios for listed plants species on the Santa Rosa Plain as required in the Programmatic Biological Opinion are based on the presence of suitable versus occupied habitat, and the potential for presence of Burke's goldfields and Sonoma sunshine; or Sebastopol meadowfoam. The site is considered to be occupied if surveys conducted using the USFWS protocol determined presence of the plants, or if the site had listed plants in the past. Protocol botanical inventories for federal listed plants on the Santa Rosa Plain consist of a minimum of three site visits per year and a minimum of two years of negative survey data within three years of project proposal submission to substantiate a negative finding. Under the Programmatic Biological Opinion, seasonal wetlands such as those present on the Wilfred Site and that are within the range of the three listed plants species are considered suitable habitat for the listed plants even if intensive surveys fail to locate their presence. This provision is necessary because seed banks are often persistent; some plant species may not produce seedlings for many years until conditions are appropriate.</p>	<p>NIGC</p> <p>USFWS</p>	<p>Tribe</p>	<p>Planning</p>
<p>D. Development impacts on CTS aestivation habitat on the Wilfred Site have been evaluated in a USFWS Biological Opinion, issued a on February 3, 2009. This approved BO requires mitigation for CTS aestivation habitat at a ratio of 1:1 within 1.3 miles of a known breeding site. And 3:1 for projects that are within 500 feet of an adult occurrence.</p> <p>With impacts to 81.13 acres of CTS habitat, Variant H-sub1 would require the purchase of 88.84 acres in a mitigation bank or of farmland purchase and placement under a conservation easement. Impacts to CTS aestivation habitat shall be mitigated off-site and shall consist of purchase of CTS credits from an approved mitigation bank or purchase of farmland providing suitable habitat for CTS (where CTS are known to occur) and placement of the land under conservation easement.</p> <p>At least a 50-foot buffer shall be maintained between wetlands and sprayfields. Mitigation plans shall also include relocation of CTS from development areas (including locations of created wetlands), the use of biological monitors on a daily basis during construction and or excavation activities, and fencing to exclude the CTS from entering the construction zone. Prior to construction work beginning each morning, the biological monitor will check equipment for animals and CTS under construction equipment and stored pipes. The biological monitor shall also check all steep-walled holes and trenches greater than one foot in depth for any CTS. The biological monitor shall remove CTS as needed from equipment and construction-related features (i.e., trenches, holes, etc.). Purchase of credits at an off-site mitigation bank may be implemented if determined to be appropriate by the USFWS during the Section 7 consultation process.</p>	<p>USFWS</p>	<p>Tribe</p>	<p>Planning</p> <p>Construction</p> <p>Operation</p>
<p>E. A pre-construction survey for burrowing owls shall be conducted to ensure impacts to burrowing</p>	<p>NIGC</p>	<p>Tribe</p>	<p>Planning</p>

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>owls, if present in the construction area, do not occur during the nesting season. The pre-construction survey shall be conducted within 30 days prior to initiation of construction activity. If active burrows are found prior to the nesting season, passive relocation measures shall be provided for each burrow in the area of the Wilfred, Stony Point site or Lakeville Site, as appropriate, that is rendered biologically unsuitable. Passive relocation measures shall include the creation of two natural or artificial burrows for each burrow rendered biologically unsuitable. Daily monitoring shall be implemented until the owls have been relocated to the new burrows. This measure will reduce potential impacts to burrowing owls. Other mitigation measures may be implemented in lieu of the proposed mitigation, including avoidance or passive relocation with one-way doors, as outlined in the "Staff Report on Burrowing Owl Mitigation" (CDFG, 1995).</p>			Construction
<p>F. Pre-construction surveys for nesting birds shall be conducted within 30 days prior to initiation of construction activity. If feasible, construction and tree removal (grubbing, vegetation removal) should be timed to take place during late summer months and through winter, ideally from September through February, to avoid impacting nesting birds and other sensitive wildlife species. The approximate nesting season extends from February to September, with a peak nesting period between March through June. If construction or grubbing activities are to take place between late February and late June, a pre-construction survey shall be performed by a qualified biologist to identify any active nests or other special-status species, at least two weeks prior to the start of construction. If bird nests are found, appropriate buffer zones shall be established around all active nests to protect nesting adults and their young from construction disturbance. Through direct consultation with wildlife agency staff, the size of buffer zones shall be determined based on site conditions and species involved. If impacts to nests are unavoidable, consultation shall continue with specific agency guidelines followed for relocation. If construction is delayed for more than two weeks, a second survey shall be performed.</p>	<p>NIGC USFWS</p>	<p>Tribe</p>	<p>Planning Construction</p>
<p>G. All grading and clearing shall be conducted after April 15 and before October 15 of any year, depending on rainfall and/or site conditions to minimize erosion. Access roads and routes will be limited, as well as the construction staging area, to the minimum size required to achieve the goals of the project. A speed limit of 15 mph on dirt roads shall be maintained. These practices will limit erosion and dust borne particles.</p>	<p>NIGC USEPA</p>	<p>Tribe</p>	<p>Planning Construction</p>
<p>H. During construction, vegetation shall only be cleared from the permitted construction footprint and necessary lay-down and assembly areas. Areas cleared of vegetation, pavement, or other substrates shall be stabilized as quickly as possible and BMPs applied (erosion fencing, straw and other material applied to soils) to prevent erosion and runoff that could affect steelhead fish in the Laguna de Santa Rosa.</p>	<p>NIGC USEPA</p>	<p>Tribe</p>	<p>Construction</p>
<p>I. Hazardous materials including fuels, oils, solvents, etc., shall be stored in sealed containers in a designated location at a minimum of 200 feet from aquatic environments. All fueling and</p>	<p>NIGC</p>	<p>Tribe</p>	<p>Construction</p>

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
maintenance of equipment shall be conducted at a minimum of 200 feet from aquatic environments.	USEPA		Operation
J. All food items and food-related trash shall be sealed in containers prior to leaving the construction site at the end of the workday; these items shall be removed from the site once every three days. This measure will limit attraction of wildlife and eliminate trash pollution in the Laguna de Santa Rosa.	NIGC	Tribe	Construction
K. Where appropriate, vegetation removed as a result of project activities shall be replaced with native species that are of value to local wildlife. Native plants have a significant cultural value, are generally more valuable as wildlife food sources, and require less irrigation, fertilizers, and pesticides than exotic species.	NIGC	Tribe	Planning Construction Operation
L. Turn off as many exterior and interior lights as possible during the peak bird migration hours of midnight to dawn to reduce potential building collisions with migration birds.	NIGC	Tribe	Operation
M. Install downcast lights with top and side shields to reduce upward and sideways illumination. This will reduce potential disorientation affects from non-directed shine to birds and wildlife species.	NIGC	Tribe	Planning Construction Operation
N. The Tribe shall make feasible changes to the parking lot design, in consultation with the USACE, to reduce wetland fill.	USACE	Tribe	Planning Construction
Cultural Resources			
A. The Tribe will implement all mitigation measures concurred upon by the State Historic Preservation Officer (SHPO) during the Section 106 consultation process, including, but not limited to, the following: a. Site RPC-5 shall be avoided by all ground disturbing activity.	SHPO	Tribe	Planning
B. To avoid potential impacts to previously unknown cultural resources, including subsurface resources, the Tribe shall include the following requirements in construction contract specifications for the project: a. In the event of any inadvertent discovery of archaeological resources during construction-	NIGC	Tribe	Planning
	BIA		Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>related earth-moving activities, all such finds shall be subject to Section 106 of the National Historic Preservation Act (NHPA) as amended (36 CFR 800). Once the land has been taken into trust for the Tribe, the inadvertent discovery of archaeological resources is also subject to the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 et seq.) and the Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S.C. 470 aa-mm). Specifically, procedures for post review discoveries without prior planning pursuant to 36 CFR 800.13 shall be followed. The following shall apply to the inadvertent discovery of both archaeological or paleontological resources: All work within 50 feet of the find shall be halted until a professional archaeologist, or paleontologist as appropriate, can assess the significance of the find. If any find is determined to be significant by the archaeologist, or the paleontologist, then representatives of the Tribe and BIA shall meet with the archaeologist, or paleontologist, to determine the appropriate course of action.</p> <p>b. If human remains are discovered during ground-disturbing activities on Tribal lands, pursuant to NAGPRA, Section 10.4 Inadvertent Discoveries, the County coroner, the Tribal Official, and representatives from the BIA and NIGC shall be contacted immediately. No further disturbance shall occur until the County coroner, the Tribal Official, and the BIA and NIGC representatives have made the necessary findings as to the origin and disposition.</p>	SHPO		
<i>Socioeconomic Conditions and Environmental Justice</i>			
A. The Tribe shall provide annual payments of at least \$157,500 to Sonoma County to mitigate for fiscal impacts to Sonoma County. The County and the Tribe are free to negotiate payments greater than this amount; however, a MOU must at least provide for annual payments of \$157,500 in order to mitigate fiscal impacts to a less-than-significant level.	NIGC	Tribe	Operation
B. Given that Variant H-sub1 has a gaming component that is smaller than FEIS Alternatives A-C, but still larger than most in California, the same crime mitigation payments cited in FEIS Table 5-5 (Table 4 in Section 6.6 of the ROD) and the City of Rohnert Park MOU would apply. Thus, the Tribe shall provide annual payments of at least \$500,000 to the City of Rohnert Park and \$700,000 to Sonoma County and the additional neighboring cities (distributed per Table 4).	NIGC	Tribe	Operation
C. The Tribe shall provide at least \$250,000 per year to a problem gambling treatment and prevention program(s). In order to maximize the effectiveness of MOU payments to treatment and prevention programs, the organization that receives the payments for problem gambling treatment must serve the Sonoma County region, and be accessible to County residents.	NIGC	Tribe	Operation
D. The Tribe shall prominently display (including on any automatic teller machines (ATMs) located on-site) materials describing the risk and signs of problem and pathological gambling behaviors. Materials shall also be prominently displayed (including on any ATMs located on-site) that provide available programs for those seeking treatment for problem and pathological gambling disorders, including, but not limited to a toll-free hotline telephone number.	NIGC	Tribe	Planning Construction
E. The Tribe shall train employees to recognize domestic violence and sexual assault situations, display domestic violence hotline numbers, and work with local agencies in domestic violence and sexual assault prevention.	NIGC	Tribe	Planning Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
			Operation
F. The Tribe shall conduct annual customer surveys in an attempt to determine the number of problem and pathological gamblers and make this information available to City of Rohnert Park, Sonoma County, state or federal gaming regulators upon request.	NIGC	Tribe	Operation
G. The Tribe shall undertake responsible gaming practices that at a minimum require that employees be educated to recognize signs of problem gamblers, that employees be trained to provide information to those seeking help, and that a system for voluntary exclusion be made available.	NIGC	Tribe	Operation
H. ATMs shall be not be visible from gaming machines and gaming tables.	NIGC	Tribe	Planning Construction Operation
Transportation/Circulation			
A. Since Caltrans' funding is limited, the Tribe shall pay for a proportionate share of the remaining costs (if any) to implement the Caltrans high-occupancy vehicle (HOV) projects along US-101 between Wilfred Avenue and Old Redwood Highway, thereby assisting in a more expedited and timely construction schedule (near term).	NIGC	Tribe	Planning
B. The Tribe shall contribute a proportionate share of the costs to widen Wilfred Avenue from Redwood Drive to Langner Avenue to three lanes in the near term and five lanes in the long term (2020).	NIGC	Tribe	Planning Construction Operation
C. The Tribe shall support efforts to complete the US-101 HOV lane project so that it can become operational prior to the scheduled completion as estimated by Caltrans (near term).	NIGC	Tribe	Planning
D. The Tribe shall contribute a proportionate share of the remaining costs (if any) of the construction of the Wilfred Avenue interchange project, including HOV lanes, ramp metering, and auxiliary lanes and support efforts related to the completion of the project in a timely fashion (near term).	NIGC	Tribe	Planning
E. The ramp metering shall be adjusted to account for the additional project traffic at the Wilfred Avenue interchange in the long term (2020).	NIGC	Tribe	Planning Construction Operation
F. The Tribe shall contribute a proportionate share to the construction of an additional traffic lane in the southbound direction from Santa Rosa Avenue to Rohnert Park Expressway and from SR-116	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
to West Sierra Avenue (2020). The Tribe shall contribute a proportionate share to the construction of auxiliary lanes between Rohnert Park Expressway and SR-116 (2020).			Construction Operation
G. Should the above additional traffic lane mitigation on US-101 be infeasible or unavailable as mitigation in the near-term or long-term, the Tribe shall investigate other options to reduce traffic congestion on US-101, such as partial funding of the planned SMART commuter transit system and other regional transit programs.	NIGC	Tribe	Planning Construction Operation
H. A Traffic Management Plan (TMP) shall be prepared in accordance with standards set forth in the United State Department of Transportation (USDOT) Manual on Uniform Traffic Control Devices for Streets and Highways. The traffic management plan shall be submitted to each affected local jurisdiction and/or agency. Also, prior to construction, the Tribe shall work with emergency service providers to avoid obstructing emergency response service. Police, fire, ambulance, and other emergency response providers shall be notified in advance of the details of the construction schedule, location of construction activities, duration of the construction period, and any access restrictions that could impact emergency response services. The TMP shall include details regarding emergency service coordination. Copies of the TMP shall be provided to all affected emergency service providers.	NIGC	Tribe	Planning Construction
I. Flagging done in consultation with the California Highway Patrol (CHP), Caltrans, and the County's Sheriff's Department, shall be provided when necessary to assist with traffic control.	NIGC	Tribe	Construction
J. Importation of construction material shall be scheduled outside of the area wide commute peak hours.	NIGC	Tribe	Construction
K. Preferential carpool or vanpool spaces shall be provided at the site to encourage ridesharing by employees and patrons.	NIGC	Tribe	Planning Construction Operation
L. The Tribe shall sponsor charter buses from destinations such as Marin County and the North Bay.	NIGC	Tribe	Operation
M. The Tribe shall provide a shuttle between the casino and Rohnert Park transit hubs that would operate on a half hour rotational basis during busy hours and on a on call basis in the times when the frequency of employees and patrons arriving or leaving busy is low.	NIGC	Tribe	Operation
N. Where feasible, lane closures or obstructions associated with construction shall be limited to off-peak hours to reduce traffic congestion and delays.	NIGC	Tribe	Construction
O. Prior to construction, the Tribe shall work to notify all potentially affected parties in the immediate	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
vicinity of the Wilfred Site, as appropriate. Notification shall include a construction schedule, location of construction activities, the duration of construction period, and alternative access provisions.			
P. Emergency service providers shall be notified of the areas that have the greatest potential for unusual traffic delays as a result of construction activities. Specific detours shall be recommended to circumvent any area that might suffer traffic delays.	NIGC	Tribe	Planning Construction
Q. The Tribe shall coordinate with the Green Music Center during events that will generate high traffic levels. During that period, traffic control services at the Rohnert Park Expressway interchange may be necessary. Thus, the Tribe shall provide funding for special event traffic monitoring at the Rohnert Park Expressway interchange to identify conflicts during outdoor events generating high traffic levels. Should conflicts occur, the Tribe shall provide traffic management coordination between the project and the Green Music Center, in consultation with the CHP and Caltrans.	NIGC CHP Caltrans	Tribe CHP Caltrans	Operation
R. Debris along construction vehicle routes shall be monitored daily during construction and the roadways cleaned as necessary.	NIGC	Tribe	Construction
S. The Tribe shall contribute their fair share to bicycle and pedestrian facilities that will increase casino patronage. The Tribe shall consider bicycle and pedestrian circulation in the design of intersections and turning movements, and that adequate sidewalk facilities, striped crosswalks, and pedestrian countdown signals for elderly and disabled citizens be provided.	NIGC	Tribe	Planning Construction
T. The Tribe shall minimize the amount of construction fill transported on the surrounding street network by eliminating the off-site travel route except where necessary to obtain materials that cannot be obtained on-site. Potential options for eliminating off-site transport include moving fill material via conveyors across barriers such as creeks and ditches or installing temporary bridges for haul vehicles across the barriers.	NIGC	Tribe	Planning Construction
U. Construction material importation shall be scheduled outside of the area wide commute peak hours. Debris along the truck route caused by trucks should be monitored daily and the roadways shall be cleaned as necessary.	NIGC	Tribe	Construction
V. Roadways subject to fill truck traffic shall be assessed by an independent third party consultant prior to the start of construction and following the completion of construction. If the third party determines that roadway deterioration has occurred as a result of casino construction, the Tribe shall pay to have surrounding roadways resurfaced to restore the pavement to at least pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements. In any event, the Tribe shall fully fund the restructuring of Labath Avenue and Langner Avenue between Wilfred Avenue and Business Park Drive following construction to facilitate site access.	NIGC	Tribe	Planning Construction Operation

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
W. Even if Wilfred Avenue is not widened to increase capacity, due to the increased use of the roadway in combination with future cumulative traffic, the Tribe shall make a proportionate share contribution to roadway improvements along Wilfred Avenue from Redwood Drive to Stony Point Road, including widened shoulders and Class II bike lanes consistent with applicable standards.	NIGC	Tribe	Planning Construction
Public Services			
A. Construction waste shall be recycled to the fullest extent practicable by diverting green waste and recyclable building materials from the solid waste stream	NIGC	Tribe	Construction
B. Environmentally preferable materials shall be selected, to the extent practicable, for construction of facilities.	NIGC	Tribe	Planning Construction
C. A solid waste management plan shall be adopted by the Tribe that addresses recycling and solid waste reduction on-site. The plan shall have a goal of at least 25% diversion of materials from disposal, which includes reduction, recycling, and reuse measures.	NIGC	Tribe	Planning Construction Operation
D. The Tribe shall install a trash compactor for cardboard and paper products.	NIGC	Tribe	Planning Construction Operation
E. The Tribe shall install recycling bins throughout the facilities for glass, cans, and paper products.	NIGC	Tribe	Planning Construction Operation
F. Decorative trash and recycling receptacles shall be placed strategically throughout the area of the Wilfred Site, Stony Point site, or the Lakeville site, as appropriate, to encourage people not to litter at the facilities.	NIGC	Tribe	Planning Construction Operation
G. Security guards shall be trained to discourage on-site littering.	NIGC	Tribe	Operation
H. The Tribe shall pay all standard fees for trash collection and disposal.	NIGC	Tribe	Operation
I. Air conditioning and refrigeration systems shall utilize environmentally friendly refrigerants. Energy efficient chillers shall also be utilized.	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
			Construction Operation
J. The air handling systems shall utilize outside air economizer cycles to take advantage of ambient cooling when the outside air temperature is below 55 degrees F. Economizer cycles may be able to reduce cooling requirements by 20 to 30 percent.	NIGC	Tribe	Planning Construction Operation
K. For applicable alternatives, hotel and casino buildings shall be equipped with a direct digital energy management and control system to perform energy conservation measures, such as optimum start/stop, duty cycling, and demand limiting. This management system will ensure that the project will not consume any more energy than is necessary.	NIGC	Tribe	Planning Construction
L. The Tribe shall use energy efficient appliances where feasible.	NIGC	Tribe	Planning Construction
M. The Tribe shall make an agreement with the applicable City or County department to address inspection, maintenance, and operation of any swimming pools, spas, or hot tubs available to patrons. The terms of the agreement shall include design review of the swimming facilities, inspection of the swimming facilities prior to operation, and at least one annual inspection for seasonal swimming facilities or bi-annual inspections for year-round swimming facilities thereafter. The agreement shall include a commitment to comply with standards for design, maintenance, and operation similar to those followed by non-tribally owned businesses in the City or County, as applicable.	NIGC	Tribe City of Rohnert Park Sonoma County	Planning Construction Operation
N. The Tribe shall provide on-site security to reduce and prevent criminal and civil incidents.	NIGC	Tribe	Operation
O. The Tribe shall adopt employee training programs and policies relating to responsible beverage services with annual training, which would include, but not be limited to, checking patron identification and refusing service to those who have imbibed beyond their ability to function safely. The Tribe shall collaborate with law enforcement by warning intoxicated patrons not to drive and by reporting drunk drivers to the authorities	NIGC	Tribe	Operation
P. The Tribe shall support local law enforcement efforts in conducting DUI checkpoints and other programs known to reduce the impacts of alcohol on the community (support shall include fully funding at least one DUI checkpoint in the vicinity of the development monthly or less frequently at the discretion of local law enforcement providers).	NIGC	Tribe Sonoma County	Operation

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
Q. All parking areas shall be well lit and monitored by parking staff and/or security guards. This will aid in the prevention of auto theft and other related criminal activity.	NIGC	CHP Tribe	Planning Construction Operation
R. The Tribe shall provide traffic control with appropriate signage and the presence of peak-hour traffic control staff. This will aid in the prevention of off-site parking, which could create possible security and safety issues.	NIGC	Tribe	Operation
S. The Tribe shall pass an ordinance creating a standard policy that encourages responsible drinking and designated driver programs. As part of this policy, the employees serving alcohol shall undergo annual Responsible Beverage Service Training (RBST), also known as "server training." RBST educates managers, servers and sellers at alcohol establishments about strategies to avoid illegally selling alcohol to underage youth or intoxicated patrons. The goal of RBST is to decrease the number of illegal alcohol sales to underage youth and intoxicated patrons through education programs. Information provided in server training must at a minimum include: <ul style="list-style-type: none"> ▪ The importance of checking age identification of customers who appear to be under the age of 30. ▪ How to identify fake IDs and what to do once a fake ID is confiscated. ▪ How to recognize situations in which adults are buying alcohol for underage youth. ▪ How to refuse sales to individuals who may supply alcohol to underage youth. ▪ How to identify intoxicated customers. ▪ How to refuse service to underage youth and intoxicated customers. 	NIGC	Tribe	Planning Construction
T. To mitigate potential impacts to law enforcement resources, the Tribe shall adopt rules prohibiting anyone under 21 years of age from gambling, adopt employee training programs and policies relating to responsible beverage services with annual training, conduct background checks of all gaming employees, provide a full complement of security personnel at the site at all times, and adopt programs and policies which discourage gang members from visiting the gaming facilities.	NIGC	Tribe	Planning Construction Operation
U. Hotel management shall work collaboratively with school and law enforcement personnel to prevent the use of hotel rooms for parties involving minors and the hotel shall have an internal monitoring program to reduce the incidence of such parties	NIGC	Tribe	Operation
V. Areas surrounding the gaming facilities shall have "No Loitering" signs in place, shall be well lit and shall be patrolled regularly. This will aid in the prevention of illegal loitering and loitering behavior that could potentially lead to other criminal acts.	NIGC	Tribe	Planning Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
			Operation
W. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws. During construction, staging areas, building areas, and/or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fuel for combustion. To the extent feasible, the contractor shall keep these areas clear of combustible materials to maintain a firebreak.	NIGC	Tribe	Construction
X. The Tribe shall make reasonable provisions for adequate emergency, fire, medical, and related relief and disaster services for patrons and employees including the development of a disaster management plan.	NIGC	Tribe	Planning Construction Operation
Y. The Tribe shall use fire resistant construction materials and equip all enclosed buildings with automatic sprinkler systems. The automatic sprinkler systems shall be designed to meet or exceed the NFPA standards governing the different occupancies associated with the project structures.	NIGC	Tribe	Planning Construction
Z. The Tribe shall employ the most modern construction and fire-engineering techniques in their automatic fire containment system designs so that any fire encountered is contained to the room of origin.	NIGC	Tribe	Planning Construction
AA. Through the use of modern fire engineering technology, the Tribe shall create and maintain a facility equipped with early detection systems that assure an initial response time to any fire alarm (automatic, local, or report) within three minutes. These systems shall include automatic sprinkler systems in the occupied areas and smoke detection, along with automatic sprinkler systems, in the areas of the facility that are normally unoccupied, such as storerooms and mechanical areas.	NIGC	Tribe	Planning Construction
BB. If only one fire pump is provided, it will be either diesel, or provided with emergency power; thereby, meeting the requirements of the CFC, and the California Building Code (CBC).	NIGC	Tribe	Planning Construction
CC. Prior to operation, the Tribe shall enter into an agreement with a fire service provider to provide primary fire protection services.	NIGC	Tribe	Planning Construction
DD. Prior to operation, the Tribe shall enter into a contract with AMR or another entity for ambulance service.	NIGC	Tribe	Planning

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
			Construction
Noise			
A. On-site HVAC equipment shall be shielded to reduce noise.	NIGC	Tribe	Planning Construction Operation
B. To the extent feasible, HVAC equipment shall be located a significant distance from neighboring houses along Whistler Avenue, Wilfred Avenue, and Labath Avenue. Whenever an HVAC unit is to be placed within 125 feet of an existing residence, an acoustical analysis shall be required to demonstrate that the HVAC noise level does not exceed 45 dBA at the nearest residence.	NIGC	Tribe	Planning Construction
C. The Tribe shall fully fund the cost of installation of acoustically-rated, dual pane windows (with a minimum Sound Transmission Class (STC) rating of 30) and acoustically rated doors on the facades facing the noise source(s) to minimize noise effects for residences adjacent to Wilfred Avenue between Redwood Drive and Stony Point Road.	NIGC	Tribe	Planning Construction
D. The Tribe shall fully fund the cost for the construction of raised, landscaped berms or solid walls at least 8 feet in height in order to separate sources of unwanted noise (including on-site traffic circulation noise) from potential noise receptors along Wilfred Avenue. Should a wall be installed, it shall be attractively designed. Adjacent landowners and adjacent governmental jurisdictions shall be consulted with prior to finalizing the design of the berm or wall.	NIGC	Tribe	Planning Construction
E. Unnecessary vehicle idling shall be prevented during loading dock operations occurring between the hours of 10:00 PM and 7:00 AM.	NIGC	Tribe	Operation
F. Buses shall not be allowed to idle unnecessarily in areas adjacent to sensitive receptors. Bus parking areas shall also be located as far as feasible from sensitive receptors.	NIGC	Tribe	Operation
G. To the extent feasible, project construction shall not occur prior to 7:00 AM or after 10:00 PM.	NIGC	Tribe	Construction
H. Pile driving, should it take place, shall not occur prior to 9:00 AM or after 5:00 PM.	NIGC	Tribe	Construction
I. On-site wastewater treatment plant equipment shall be shielded or enclosed.	NIGC	Tribe	Planning Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
			Operation
J. Stationary noise-producing equipment such as compressors and generators shall be placed as far as practical from homes, and shielding shall be provided between any such equipment and homes when it is necessary to operate the equipment closer than 200 feet from a home.	NIGC	Tribe	Planning Construction Operation
Hazardous Materials			
A. In the event that contaminated soil and/or groundwater or other hazardous materials are encountered during construction-related earth-moving activities, all work shall be halted until a qualified individual can assess the extent of contamination. If contamination is determined to be significant, representatives of the Tribe shall consult with the USEPA to determine the appropriate course of action, including the development of a sampling plan and remediation plan if necessary.	NIGC USEPA	Tribe	Construction
B. To reduce the potential for accidental releases, fuel, oil, and hydraulic fluids shall be transferred directly from a service truck to construction equipment and shall not otherwise be stored onsite. Paint, paint thinner, solvents, cleaners, sealants, and lubricants used during construction shall be stored in a locked utility building, handled per the manufacturers' directions, and replenished as needed.	NIGC USEPA	Tribe	Planning Construction Operation
C. Personnel shall follow written standard operating procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving the hazardous materials, shall include the following: a. Refueling shall be conducted only with approved pumps, hoses, and nozzles. b. Catch-pans shall be placed under equipment to catch potential spills during servicing. c. All disconnected hoses shall be placed in containers to collect residual fuel from the hose. d. Vehicle engines shall be shut down during refueling. e. No smoking, open flames, or welding shall be allowed in refueling or service areas. f. Refueling shall be performed away from bodies of water to prevent contamination of water in the event of a leak or spill. g. Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents. h. Should a spill contaminate any soil, the soil shall be put into containers and disposed of in accordance with local, state, and federal regulations. i. All containers used to store hazardous materials shall be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas shall be inspected monthly.	NIGC USEPA	Tribe	Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<p>Results of inspections shall be recorded in a logbook that shall be maintained on-site.</p> <p>j. Staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fuel for combustion. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.</p> <p>k. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order.</p>			
D. The amount of hazardous materials used in project construction and operation shall be kept at the lowest required volumes.	NIGC USEPA	Tribe	Construction Operation
E. The least toxic material capable of achieving the intended result shall be used to the extent practicable. Non-toxic alternatives shall include garden care products and organic non-toxic cleaners when feasible.	NIGC USEPA	Tribe	Construction Operation
F. A hazardous materials and hazardous waste minimization program shall be developed, implemented, and reviewed annually by the Tribe to determine if additional opportunities for hazardous materials and hazardous waste minimization are feasible, for both project construction and operation.	NIGC USEPA	Tribe	Planning Construction Operation
G. Use of pesticides and toxic chemicals shall be minimized to the greatest extent feasible in landscaping; or less toxic alternatives shall be used.	NIGC USEPA	Tribe	Operation
H. In addition to mitigation described under FEIS Section 5.2.2, the following mitigation shall be implemented: During the groundwater monitoring and pump tests, the potential for the vertical and lateral migration of contaminants from nearby leaking underground storage tank (LUST) sites shall be evaluated (see Appendix Z of the FEIS for detailed recommendations). The pumping test conducted shall include taking water level measurements in wells that are screened in the Lower Intermediate Zone, Upper Intermediate Zone, and uppermost portion of the saturated zone to verify the conclusions based on historical well hydrographs, refine the drawdown model for the Site, and evaluate the potential for contaminant migration using a typical wellhead protection approach. Implementation of the above measures will reduce any potential impacts to less than significant.	NIGC USEPA	Tribe	Construction

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
I. Material Safety Data Sheets (MSDS) will be available to casino and emergency personnel and to janitors that identify emergency procedures, safe handling and storage practices. A Hazardous Materials Business Plan for the WWTP will be prepared to addresses emergency response and employee training in first aide in the event a spill of citric acid and sodium hypochloride occurs that compromises the chemical storage containment vessels.	NIGC USEPA	Tribe	Planning Construction Operation
J. A Waste Water Contingency Plan shall be prepared for the WWTP prior to construction that shall identify potential system failures and containment measures. These containment measures shall be made part of the WWTP design to ensure no untreated wastewater will be released from the WWTP in the event of a system failure.	NIGC USEPA	Tribe	Planning Construction Operation
K. Prior to demolition of any residential structures on the Wilfred site, an asbestos consultant will be hired by the Tribe to determine if Asbestos Containing Materials (ACMs) and lead based paints are present within the residential structures. If ACMs are present within the residential structures, the Tribe shall comply with any federal NESHAP laws requiring BMPs to be employed during demolition as well as recommendations from the asbestos consultant for the removal and disposal of demolition debris that contain lead based paints and ACMs. Recommendations shall at a minimum include BMPs such as applying water to the structures before, during, and after demolition.	NIGC USEPA	Tribe	Planning
Aesthetics			
A. Design elements shall be incorporated into the project to minimize the impact of buildings and parking lots on the viewshed. These elements include: a. Incorporation of landscape amenities to complement buildings and parking areas, including setbacks, raised landscaped berms and plantings of trees and shrubs (see Noise Mitigation Measures) b. Use of earth tones in paints and coatings, and native building materials such as stone.	NIGC	Tribe	Planning Construction
B. To minimize the impacts of light and glare: a. Placement of floodlights on buildings shall be set so as not to cast trespassing light off-site. b. Uplighting of structures has a high potential for off-site light spillage and shall be minimized by limiting uplighting to the main casino and hotel facades and prohibiting uplighting of the parking structure and ancillary structures. Any uplighting of the main casino and hotel facades shall be directly focused on the structures. c. Shielding, such as with a horizontal shroud, shall be used for all outdoor parking lot lighting so as to ensure it is downcast.	NIGC	Tribe	Planning Construction Operation

MITIGATION MONITORING AND ENFORCEMENT PROGRAM

MITIGATION MEASURE*	RESPONSIBLE AGENCY	IMPLEMENTING ENTITY	TIMING
<ul style="list-style-type: none"> d. Timers shall be utilized so as to minimize lighting after a certain hour. e. Signs and facades shall be tastefully designed, without the use of obtrusive light emitting devices such as neon lights or flashing lights. f. All exterior glass shall be non-reflective low-glare glass. 			
LEED Certification			
A. The Tribe shall pursue LEED Certification for the hotel component of the project.	NIGC	Tribe	Planning Construction

* Mitigation measures are included in this table in summary form for the NIGC's current Preferred Alternative (Alternative H-sub1). Thus, the lettering and organization of individual mitigation measures may not conform with the lettering and organization of mitigation measures in the FEIS or the ROD.

ATTACHMENT 7

PM_{2.5} Technical Memorandum



ANALYTICAL ENVIRONMENTAL SERVICES

TECHNICAL MEMORANDUM

DATE: JANUARY 22, 2010

SUBJECT: COMPARISON OF SURROGATED PM_{2.5} EMISSION ESTIMATES TO URBEMIS MODELING RESULTS FOR THE GRATON CASINO AND HOTEL PROJECT.

An air quality analysis was performed for the Proposed Project and Alternatives in the Draft and Final Environmental Impact Statement (EIS) for the Graton Rancheria Casino and Hotel Project using the Urban Emissions (URBEMIS) model that was current at the time of the analysis. This model did not provide emission estimates for particulate matter 2.5 microns in size (PM_{2.5}). Therefore, particulate matter 10 microns in size (PM₁₀) was used as a surrogate to estimate PM_{2.5} emissions. Specifically, 99.2 percent of PM₁₀ emissions were used to estimate PM_{2.5} emissions, which was consistent with the California Air Resource Board's speciation profile of gasoline powered engine emissions.

The most recent version of URBEMIS now includes PM_{2.5} emission estimates for construction and operation for various land uses. Therefore, to confirm that surrogated PM_{2.5} emissions are not underestimating actual impacts, the most recent URBEMIS air quality model was used to estimate PM_{2.5} emissions for the Proposed Project (Alternative A) and the Preferred Alternative (Variant H-sub1). These PM_{2.5} emission estimates were then compared to the surrogated PM_{2.5} emissions (**Table 1**). URBEMIS output files are included as **Attachment A**.

TABLE 1			
REPRESENTATIVE PM_{2.5} SURROGATED AND MODELED EMISSIONS			
Alternative/ Phase	Surrogated PM_{2.5}	Modeled PM_{2.5}	Percent Over-Estimated by Surrogated Calculation
	tons per year		%
Alternative A			
Construction¹	4.2	1.28	69.5
Operation	141	30.29	79.5
Variant H-sub1			
Construction¹	0.89	0.28	68.5
Operation	138.49	26.33	80.9

¹ Based on the highest construction year emissions.
Source: URBEMIS, 2007; AES, 2009.

Table 1 compares the surrogated $PM_{2.5}$ emissions and the URBEMIS modeled $PM_{2.5}$ emissions. The Proposed Project and the Preferred Alternative were used as a representative sample of the other alternatives analyzed in the EIS. This is appropriate given that the other alternatives use the same equations within the URBEMIS model to determine PM_{10} and $PM_{2.5}$ and the same 99.2 percent of PM_{10} emissions was used to determine surrogated $PM_{2.5}$ emissions. Therefore, the modeled results as a percentage of surrogated emissions estimates will be proportionally similar for all alternatives. This is demonstrated by the similar results for the Proposed Project and Preferred Alternative, as shown in **Table 1**. The surrogated $PM_{2.5}$ emissions were found to be at minimum 69.5 percent greater than the modeled $PM_{2.5}$. This demonstrates that the surrogated $PM_{2.5}$ emission estimates are conservative in that they overestimate the amount of $PM_{2.5}$ emissions emitted for each alternative.

ATTACHMENT A

URBEMIS OUTPUT FILES

Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\equinn\Application Data\Urbemis\Version9a\Projects\Graton Alts. A, B, C,and F GHG.urb924

Project Name: Graton GHG - Alternatives A, B, C, and F

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>
2007 TOTALS (tons/year unmitigated)	0.90	0.38	1.28
2007 TOTALS (tons/year mitigated)	0.90	0.38	1.28
Percent Reduction	0.00	0.00	0.00
2008 TOTALS (tons/year unmitigated)	0.02	0.51	0.53
2008 TOTALS (tons/year mitigated)	0.02	0.51	0.53
Percent Reduction	0.00	0.00	0.00
2009 TOTALS (tons/year unmitigated)	0.01	0.48	0.49
2009 TOTALS (tons/year mitigated)	0.01	0.48	0.49
Percent Reduction	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	0.00

OPERATIONAL (VEHICLE) EMISSION
ESTIMATES

	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	30.29

SUM OF AREA SOURCE AND OPERATIONAL EMISSION
ESTIMATES

	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	30.29

Page: 1

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\equinn\Application Data\Urbemis\Version9a\Projects\Graton Alts. A, B, C,and F GHG.urb924

Project Name: Graton GHG - Alternatives A, B, C, and F

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>
2007 TOTALS (lbs/day unmitigated)	26.86	10.47	37.33
2007 TOTALS (lbs/day mitigated)	26.86	10.47	37.33
2008 TOTALS (lbs/day unmitigated)	0.13	3.91	4.04
2008 TOTALS (lbs/day mitigated)	0.13	3.91	4.04
2009 TOTALS (lbs/day unmitigated)	0.13	5.88	6.02
2009 TOTALS (lbs/day mitigated)	0.13	5.88	6.02

AREA SOURCE EMISSION ESTIMATES

	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	0.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	165.98

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	166.00

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>
Time Slice 6/1/2007-6/29/2007	1.50	3.14	4.64
Active Days: 21			
Demolition 06/01/2007-07/01/2007	1.50	3.14	4.64
Fugitive Dust	1.46	0.00	1.46
Demo Off Road Diesel	0.00	1.94	1.94
Demo On Road Diesel	0.04	1.19	1.24
Demo Worker Trips	0.00	0.00	0.00
Time Slice 7/2/2007-8/31/2007	26.74	6.31	33.04
Active Days: 45			
Mass Grading 07/01/2007-08/31/2007	26.74	6.31	33.04
Mass Grading Dust	26.73	0.00	26.73
Mass Grading Off Road Diesel	0.00	6.30	6.30
Mass Grading On Road Diesel	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.02
Time Slice 9/3/2007-9/28/2007	26.74	6.31	33.04
Active Days: 20			
Fine Grading 09/01/2007-10/01/2007	26.74	6.31	33.04
Fine Grading Dust	26.73	0.00	26.73
Fine Grading Off Road Diesel	0.00	6.30	6.30
Fine Grading On Road Diesel	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.02

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Time Slice 10/1/2007-10/1/2007	<u>26.86</u>	<u>10.47</u>	<u>37.33</u>
Active Days: 1			
Building 10/01/2007-09/30/2009	0.13	4.16	4.29
Building Off Road Diesel	0.00	3.10	3.10
Building Vendor Trips	0.05	0.98	1.04
Building Worker Trips	0.07	0.08	0.15
Fine Grading 09/01/2007-10/01/2007	26.74	6.31	33.04
Fine Grading Dust	26.73	0.00	26.73
Fine Grading Off Road Diesel	0.00	6.30	6.30
Fine Grading On Road Diesel	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.02
Time Slice 10/2/2007-12/31/2007	0.13	4.16	4.29
Active Days: 65			
Building 10/01/2007-09/30/2009	0.13	4.16	4.29
Building Off Road Diesel	0.00	3.10	3.10
Building Vendor Trips	0.05	0.98	1.04
Building Worker Trips	0.07	0.08	0.15
Time Slice 1/1/2008-12/30/2008	0.13	3.91	4.04
Active Days: 261			
Building 10/01/2007-09/30/2009	0.13	3.91	4.04
Building Off Road Diesel	0.00	2.92	2.92
Building Vendor Trips	0.05	0.91	0.96
Building Worker Trips	0.07	0.08	0.15

12/18/2009 4:16:04 PM

Time Slice 12/31/2008-12/31/2008	<u>0.13</u>	<u>3.91</u>	<u>4.04</u>
Active Days: 1			
Building 10/01/2007-09/30/2009	0.13	3.91	4.04
Building Off Road Diesel	0.00	2.92	2.92
Building Vendor Trips	0.05	0.91	0.96
Building Worker Trips	0.07	0.08	0.15
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00
Time Slice 1/1/2009-7/31/2009	0.13	3.68	3.80
Active Days: 152			
Building 10/01/2007-09/30/2009	0.13	3.67	3.80
Building Off Road Diesel	0.00	2.77	2.77
Building Vendor Trips	0.05	0.82	0.88
Building Worker Trips	0.07	0.08	0.15
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00

12/18/2009 4:16:04 PM

Time Slice 8/3/2009-9/30/2009	<u>0.13</u>	<u>5.88</u>	<u>6.02</u>
Active Days: 43			
Asphalt 08/01/2009-12/31/2009	0.01	2.21	2.22
Paving Off-Gas	0.00	0.00	0.00
Paving Off Road Diesel	0.00	2.12	2.12
Paving On Road Diesel	0.00	0.09	0.09
Paving Worker Trips	0.00	0.00	0.01
Building 10/01/2007-09/30/2009	0.13	3.67	3.80
Building Off Road Diesel	0.00	2.77	2.77
Building Vendor Trips	0.05	0.82	0.88
Building Worker Trips	0.07	0.08	0.15
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00
Time Slice 10/1/2009-12/31/2009	0.01	2.21	2.22
Active Days: 66			
Asphalt 08/01/2009-12/31/2009	0.01	2.21	2.22
Paving Off-Gas	0.00	0.00	0.00
Paving Off Road Diesel	0.00	2.12	2.12
Paving On Road Diesel	0.00	0.09	0.09
Paving Worker Trips	0.00	0.00	0.01
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00

12/18/2009 4:16:04 PM

Phase Assumptions

Phase: Demolition 6/1/2007 - 7/1/2007 - Type Your Description Here

Building Volume Total (cubic feet): 85162

Building Volume Daily (cubic feet): 16698

On Road Truck Travel (VMT): 927.67

Off-Road Equipment:

- 1 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
- 2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Fine Grading 9/1/2007 - 10/1/2007 - Default Fine Site Grading Description

Total Acres Disturbed: 25.62

Maximum Daily Acreage Disturbed: 6.4

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

- 2 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day
- 3 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day
- 2 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
- 2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
- 2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
- 3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Mass Grading 7/1/2007 - 8/31/2007 - Type Your Description Here

Total Acres Disturbed: 25.62

Maximum Daily Acreage Disturbed: 6.4

Fugitive Dust Level of Detail: Default

Page: 8

12/18/2009 4:16:04 PM

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

- 2 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day
- 3 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day
- 2 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
- 2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
- 2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day
- 3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Paving 8/1/2009 - 12/31/2009 - Default Paving Description

Acres to be Paved: 6.4

Off-Road Equipment:

- 2 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
- 2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day
- 3 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 10/1/2007 - 9/30/2009 - Default Building Construction Description

Off-Road Equipment:

- 3 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day
- 2 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day
- 3 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day
- 3 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 8 hours per day
- 2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 12/31/2008 - 12/31/2009 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

12/18/2009 4:16:04 PM

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>
Time Slice 6/1/2007-6/29/2007	1.50	3.14	4.64
Active Days: 21			
Demolition 06/01/2007-07/01/2007	1.50	3.14	4.64
Fugitive Dust	1.46	0.00	1.46
Demo Off Road Diesel	0.00	1.94	1.94
Demo On Road Diesel	0.04	1.19	1.24
Demo Worker Trips	0.00	0.00	0.00
Time Slice 7/2/2007-8/31/2007	26.74	6.31	33.04
Active Days: 45			
Mass Grading 07/01/2007-08/31/2007	26.74	6.31	33.04
Mass Grading Dust	26.73	0.00	26.73
Mass Grading Off Road Diesel	0.00	6.30	6.30
Mass Grading On Road Diesel	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.02

12/18/2009 4:16:04 PM

Time Slice 9/3/2007-9/28/2007	26.74	6.31	33.04
Active Days: 20			
Fine Grading 09/01/2007-10/01/2007	26.74	6.31	33.04
Fine Grading Dust	26.73	0.00	26.73
Fine Grading Off Road Diesel	0.00	6.30	6.30
Fine Grading On Road Diesel	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.02
Time Slice 10/1/2007-10/1/2007	<u>26.86</u>	<u>10.47</u>	<u>37.33</u>
Active Days: 1			
Building 10/01/2007-09/30/2009	0.13	4.16	4.29
Building Off Road Diesel	0.00	3.10	3.10
Building Vendor Trips	0.05	0.98	1.04
Building Worker Trips	0.07	0.08	0.15
Fine Grading 09/01/2007-10/01/2007	26.74	6.31	33.04
Fine Grading Dust	26.73	0.00	26.73
Fine Grading Off Road Diesel	0.00	6.30	6.30
Fine Grading On Road Diesel	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.02
Time Slice 10/2/2007-12/31/2007	0.13	4.16	4.29
Active Days: 65			
Building 10/01/2007-09/30/2009	0.13	4.16	4.29
Building Off Road Diesel	0.00	3.10	3.10
Building Vendor Trips	0.05	0.98	1.04
Building Worker Trips	0.07	0.08	0.15

12/18/2009 4:16:04 PM

Time Slice 1/1/2008-12/30/2008	0.13	3.91	4.04
Active Days: 261			
Building 10/01/2007-09/30/2009	0.13	3.91	4.04
Building Off Road Diesel	0.00	2.92	2.92
Building Vendor Trips	0.05	0.91	0.96
Building Worker Trips	0.07	0.08	0.15
Time Slice 12/31/2008-12/31/2008	<u>0.13</u>	<u>3.91</u>	<u>4.04</u>
Active Days: 1			
Building 10/01/2007-09/30/2009	0.13	3.91	4.04
Building Off Road Diesel	0.00	2.92	2.92
Building Vendor Trips	0.05	0.91	0.96
Building Worker Trips	0.07	0.08	0.15
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00
Time Slice 1/1/2009-7/31/2009	0.13	3.68	3.80
Active Days: 152			
Building 10/01/2007-09/30/2009	0.13	3.67	3.80
Building Off Road Diesel	0.00	2.77	2.77
Building Vendor Trips	0.05	0.82	0.88
Building Worker Trips	0.07	0.08	0.15
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00

12/18/2009 4:16:05 PM

Time Slice 8/3/2009-9/30/2009	<u>0.13</u>	<u>5.88</u>	<u>6.02</u>
Active Days: 43			
Asphalt 08/01/2009-12/31/2009	0.01	2.21	2.22
Paving Off-Gas	0.00	0.00	0.00
Paving Off Road Diesel	0.00	2.12	2.12
Paving On Road Diesel	0.00	0.09	0.09
Paving Worker Trips	0.00	0.00	0.01
Building 10/01/2007-09/30/2009	0.13	3.67	3.80
Building Off Road Diesel	0.00	2.77	2.77
Building Vendor Trips	0.05	0.82	0.88
Building Worker Trips	0.07	0.08	0.15
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00
Time Slice 10/1/2009-12/31/2009	0.01	2.21	2.22
Active Days: 66			
Asphalt 08/01/2009-12/31/2009	0.01	2.21	2.22
Paving Off-Gas	0.00	0.00	0.00
Paving Off Road Diesel	0.00	2.12	2.12
Paving On Road Diesel	0.00	0.09	0.09
Paving Worker Trips	0.00	0.00	0.01
Coating 12/31/2008-12/31/2009	0.00	0.00	0.00
Architectural Coating	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Architectural Coating 12/31/2008 - 12/31/2009 - Default Architectural Coating Description

For Residential Architectural Coating Measures, the Residential Exterior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

For Residential Architectural Coating Measures, the Residential Interior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>PM2.5</u>
Natural Gas	0.01
Hearth - No Summer Emissions	
Landscape	0.01
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	0.02

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>PM25</u>
Hotel	8.01
Casino	157.97
TOTALS (lbs/day, unmitigated)	165.98

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2020 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

<u>Summary of Land Uses</u>						
Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Hotel		2.72	rooms	300.00	816.00	24,850.92
Casino		39.43	1000 sq ft	408.00	16,087.44	489,935.95
					16,903.44	514,786.87

<u>Vehicle Fleet Mix</u>				
Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.0	0.0	100.0	0.0
Light Truck < 3750 lbs	12.6	0.0	98.4	1.6
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0

Vehicle Fleet Mix				
Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	40.6	59.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions						
	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	35.5	35.5	11.8	35.5	35.5
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5
Casino				5.0	2.5	92.5

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 11.8 miles

Home-based shop urban trip length changed from 7.3 miles to 35.5 miles

Home-based other urban trip length changed from 7.5 miles to 35.5 miles

Commercial-based commute urban trip length changed from 9.5 miles to 11.8 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 35.5 miles

Commercial-based customer urban trip length changed from 7.35 miles to 35.5 miles