March 2006

Kaiser South Sacramento Medical Center Expansion

Draft Environmental Impact Report Appendices

State Clearinghouse Number: 2005102127

PREPARED FOR:
City of Sacramento

PREPARED BY:
RBF CONSULTING

DRAFT ENVIRONMENTAL IMPACT REPORT APPENDICES

KAISER SOUTH SACRAMENTO MEDICAL CENTER EXPANSION

Appendix A

Notice of Preparation, Initial Study and Public Comments

Notice of Preparation

DEVELOPMENT SERVICES
DEPARTMENT

CITY OF SACRAMENTO
CALIFORNIA

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SECOND FLOOR
SACRAMENTO, CA
953824

PLANNING
916-808-2762
FAX: 916-566-3968

DATE: October 28, 2005

TO: Interested Persons

FROM: Dana Allen, Environmental Project Manager

SUBJECT: NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE KAISER PERMANENTE SOUTH SACRAMENTO MEDICAL CENTER EXPANSION (P04-185)

PUBLIC REVIEW PERIOD: OCTOBER 28, 2005 THROUGH NOVEMBER 28, 2005

Introduction

The City of Sacramento Development Services Department is the lead agency for the preparation of an Environmental Impact Report (EIR) for the above referenced project located in the City of Sacramento. The document is being prepared in compliance with the California Environmental Quality Act (CEQA).

The EIR will evaluate the potential environmental impacts of the proposed project, and recommend mitigation measures, as required. The Project EIR will be prepared in compliance with CEQA Guidelines, Section 15161. The EIR will evaluate the potential impacts of the proposed expansion of the Kaiser Permanente South Sacramento Medical Center.

CEQA Section 15082 states that, once a decision is made to prepare an EIR, the lead agency (the City of Sacramento) must prepare a Notice of Preparation (NOP) to inform all responsible agencies that an EIR will be prepared. The NOP must also be sent to each governmental agency expected to be involved in approving or funding elements of the project. The purpose of the NOP is to provide sufficient information describing the project and the potential environmental effects to enable the agencies to make a meaningful response regarding the scope and content of the information to be included in the EIR.

Project Area

The entire project area is located on approximately 48.5 acres bounded by Bruceville Road to the northeast, Valley Hi Drive to the west, and Wyndham Drive to the south (see Figure 1, Location Map). The existing Kaiser Permanente Medical Center is located on the proposed project site at 6600 Bruceville Road. Further east of the project site is State Route 99. Land uses to the north include retail and commercial offices, to the south and west multi-family residential land uses and a childcare center, and to the east State Route 99. The site is identified by Assessor's Parcel Numbers (APNs) 117-0170-061, 117-0170-066, 117-0170-074, and 117-0170-075.

Project Background

On October 26, 1982, the Sacramento City Council granted the necessary discretionary planning entitlements for Kaiser Foundation to establish a major medical center within the South Sacramento community. The first phase included a five-story hospital and a two-story medical office building (MOB1). Along with construction of a second medical office building (MOB 2) in 1991, the City of Sacramento approved a Master Plan with a planning horizon to 2003. The Master Plan called for twelve phases of growth, and the first nine have lead to the current campus. The tenth phase, the construction of a medical office building (MOB 4) occurred on a new site located south of the campus at the corner of Bruceville Road and Wyndham Drive (P02-075). The eleventh phase, expansion of the D.B. Moore Building for inpatient psychiatric care, was dependent on the regional decision whether or not to outsource this care. However, the delivery of care within the Sacramento area has evolved over the last ten years and inpatient psychiatric care is now subcontracted. Thus, the D.B. Moore psychiatric building was downgraded to medical office occupancies. The twelfth phase was proposed to be an expansion of the hospital nursing units and was initially intended to be developed above the recent Emergency Department addition. However, Kaiser decided to terminate completion of the twelfth phase. Nevertheless, the continued evolution of the Medical Center is based on the City's zoning and general development standards.

Project Description

The proposed project would add the following structures to the project site, thereby increasing the entire Kaiser Medical Center to approximately 793,500 square feet:

- An approximately 158,000 square-foot Hospital Tower (basement plus five levels above grade) south of the existing hospital building, containing 96 new medical surgery beds, 20 new intensive care beds, and 20 intensive care beds relocated from the existing hospital. Additionally, one existing medical surgery bed would be eliminated form the existing hospital, resulting in a total of 115 new hospital beds;
- A two-story, approximately 57,000 square foot Outpatient Surgery Center (OSC) with a six-room surgery suite constructed west of the new Hospital Tower;
- A five-story approximately 882 space parking structure on the north side of the campus along Bruceville Road. In addition, surface parking lots on the west side of the campus would be constructed to maintain City and Kaiser Permanente parking requirements;
- An addition to the Central Utility Plant consisting of a new single-story approximately 4,000 square foot chiller addition to support the hospital expansion;
- A single-story,10,000 square foot Emergency Department (ED) addition east of the existing ED for possible trauma services;
- A two-story 15,000 square foot addition to outpatient services on the west side of the existing MOB 1; and
- An emergency helicopter landing pad as part of the new trauma center.

Additional site upgrades include the realignment of segments of the campus ring road, the addition of dedicated pick-up and drop-off zones, the addition of ingress and egress drives, and the improvement of on-site way-finding (see Figure 2, Site Plan)

Possible Project Approvals and/or Entitlements Required:

- Special Permit (Major) Modification for Outpatient Surgery Center and Hospital Expansion;
- Special Permit for Helipad; and
- Lot Line Adjustment to abandon easements that are no longer used or needed.

Project Objectives

The expansion of the Kaiser Permanente South Sacramento Medical Center would meet the needs of the growing South Sacramento community. The project sponsor proposes to provide additional inpatient bed and preoperative services. The current bed demand for the South Sacramento Medical Center is 128.7 beds and is expected to increase to 185.2 beds by 2007. With a present capacity of 162 beds (102 medical surgical, 20 intensive care, 29 post partum, and 8 neo-natal intensive care), the existing facility is anticipated to be undersized by 12.5 percent by the end of 2007. The proposed project would also address regulatory requirements, provide greater site and strategic flexibility, and resolve existing space deficits. Finally, the project sponsor proposes to provide an emergency helicopter landing pad as part of a new trauma center.

Other Agency Actions

Implementation of the Project may require one or more actions by the following agencies:

- City of Sacramento
- California Department of Transportation
- Sacramento County Health Department
- State of California Office of State Hospital Planning and Development (OSHPD) Permit (for Hospital and Central Utility Plant)
- Federal Aviation Administration (FAA) Permit (for Helipad)

Project Schedule

After certification of the EIR, which is currently anticipated to be mid-2006, construction is anticipated to take approximately three years. Construction is scheduled to begin in late 2006 with the expansion completed in late 2009, all subject to funding and approvals. Construction would occur in phases: the first phase – construction of new parking lots and new parking structure; the second phase – upgrading and expanding the Central Utility Plant as well as realignment of the southerly segment of the ring road; and the third and final phase – near simultaneous construction of the Outpatient Surgery Center and Hospital Addition. Expected dates for licensing and occupancy are June 2007 for site work and July 2009 for buildings.

Environmental Effects

The City has reviewed the proposed Kaiser Permanente South Sacramento Medical Center Expansion, and determined that an EIR should be prepared. At this time, it is anticipated that the following environmental issues will be evaluated as part of the environmental review. Some of the issues identified may be analyzed in the Initial Study. Issues requiring in-depth analysis will be evaluated in the EIR.

Traffic: The EIR will assess the potential transportation impacts associated with existing conditions and with the proposed project. The proposed project would modify vehicle circulation and reconfigure existing parking lots. On-site parking would be modified to accommodate the proposed project. Mitigation measures will be developed, if possible and feasible, for transportation impacts. All mitigation measures will reflect City policies and practices, and will consider phasing, feasibility, and the availability of right-of-way. The analysis will include a review of the proposed project's potential impacts on the pedestrian, bicycle, and transit systems.

Air Quality: Potential air quality impacts of the project, including those associated with both project construction and operation (both stationary and mobile source emissions) will be evaluated.

Cumulative Impacts: The EIR will assess the project's cumulative impacts of the project for each of the environmental issues evaluated in the EIR.

Alternatives

The EIR will also examine a range of feasible alternatives to the proposed project. Feasible alternatives will be defined by the City based on the Initial Study, EIR analysis, public community meetings, and public comments received on the NOP.

Submitting Comments

To ensure that the full range of project issues of interest to responsible government agencies and the public are addressed, comments and suggestions are invited from all interested parties. Written comments or questions concerning the project EIR should be directed to the environmental project manager at the following address by **5:00 p.m. on November 28, 2005**:

Dana Allen, Senior Planner
City of Sacramento , Development Services Department
2101 Arena Blvd. Second Floor
Sacramento, CA 95834
(916) 808-2762
(916) 566-3968 fax

All comments must include full name and address in order for staff to respond appropriately.

Initial Study

KAISER PERMANENTE SOUTH SACRAMENTO MEDICAL CENTER EXPANSION (P04-185)
INITIAL STUDY

This Initial Study has been required by the Planning and Building Department, Environmental Planning Services, 2101 Arena Boulevard, 2nd Floor, Sacramento, CA 95834 and prepared by RBF Consulting, pursuant to Title 14, Section 15070 of the California Code of Regulations and the Sacramento Local Environmental Regulations (Resolution 91-892) adopted by the City of Sacramento.

ORGANIZATION OF THE INITIAL STUDY

This Initial Study is organized into the following sections:

SECTION I - BACKGROUND: Page 2 - Provides summary background information about the project name, location, sponsor, and when the Initial Study was completed.

SECTION II - PROJECT DESCRIPTION: Page 4 - Includes a detailed description of the proposed project.

SECTION III - ENVIRONMENTAL CHECKLIST AND DISCUSSION: Page 6 - Contains the Environmental Checklist form together with a discussion of the checklist questions. The Checklist Form is used to determine the following for the proposed project: 1) "Potentially Significant Impacts," which identifies impacts that may not be mitigated with the inclusion of mitigation measures; 2) "Potentially Significant Impacts Unless Mitigated," which identifies impacts that could be mitigated with incorporation of mitigation measures; and 3) "Less Than Significant Impacts," which identifies impacts that would be less than significant and do not require the implementation of mitigation measures.

SECTION IV - ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: Page 50 - Identifies which environmental factors were determined to have either a "Potentially Significant Impact" or "Potentially Significant Impact Unless Mitigated," as indicated in the Environmental Checklist.

SECTION V - DETERMINATION: Page 51 - Identifies the determination of whether impacts associated with development of the proposed project are significant, and what, if any, added environmental documentation may be required.

ATTACHMENTS: Vicinity Map; Site Plan

APPENDICES: The Acoustics and Vibrations Group, Noise Impact Study, December 8, 2004; The Acoustics and Vibrations Group, Response to Questions Letter, July 14, 2005; RBF Consulting Memorandum from Maria Cadiz to Darcy Kremin, Re: Noise Analysis, August 17, 2005; RBF Consulting Memorandum from Maria Cadiz to Darcy Kremin, Re: Vehicular Noise Analysis, October 6, 2005; Site Tree Inventory, Lionakis Beaumont Design Group, Inc., November 30, 2004; and North Central Information Center, Records Search, October 19, 2005.

SECTION I - BACKGROUND

File Number, Project Name: P04-185, Kaiser Permanente South Sacramento Medical Center Expansion

Project Location: The project site is located within an existing medical center campus (approximately 48.5 acres) at 6600 Bruceville Road in the South Sacramento Community Plan area, APNs 117-0170-061, 117-0170-066, 117-0170-067, 117-0170-074 and 117-0170-075. Refer to Attachment 1, Vicinity Map.

Project Sponsor and Contact Persons:

Giles Popish
Senior Project Manager
Kaiser Foundation Health Plan, Inc.
6600 Bruceville Road
Sacramento, CA 95823
(916) 525-3033

Project Planner:

Ellen Marshall, Associate Planner
Development Services Department
City of Sacramento
915 I Street, 3rd Floor
Sacramento, CA 95814
(916) 808-5851

Environmental Planner:

Dana Allen, Senior Planner
Development Services Department
Environmental Planning Services
City of Sacramento
2101 Arena Boulevard, 2nd Floor
Sacramento, CA 95834
(916) 808-2762

Date Initial Study Completed: October 21, 2005

INTRODUCTION

The following Initial Study has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Sections 15000 et seq.). The City of Sacramento is the lead agency for the preparation of this Initial Study for the Kaiser Permanente South Sacramento Medical Center Expansion proposed by the Kaiser Foundation.

The City has determined that an Environmental Impact Report (EIR) is the appropriate environmental document for the proposed project. This environmental review examines project effects which are identified as potentially significant effects on the environment or which may be substantially reduced or avoided by the adoption of revisions or conditions to the design of project specific features. It is believed at this time that the project would result in potentially significant air quality and transportation/circulation impacts.

This analysis incorporates by reference the general discussion portions of earlier environmental documents (CEQA Guidelines Section 15150(a)). These documents are available for public review at the City of Sacramento, Development Services Department, 2101 Arena Boulevard, 2nd Floor, Sacramento, and include the following:

- South Sacramento Community Plan (SSCP), 1986; and
- City of Sacramento General Plan Update Draft Environmental Impact Report (SGPU DEIR), 1987.

The City is soliciting views of interested persons and agencies on the content of the environmental information presented in this document. Due to the time limits mandated by state law, your response must be sent at the earliest possible date, but no later than the 30-day review period ending November 28, 2005.

Please send written responses to:

Dana Allen, Senior Planner
Development Services Department
Environmental Planning Services
City of Sacramento
2101 Arena Boulevard, 2nd Floor
Sacramento, CA 95834
FAX (916) 566-3968
dallen@cityofsacramento.org

SECTION II - PROJECT DESCRIPTION

PROJECT LOCATION

The project site is located within an existing medical center campus (approximately 48.5 acres) at 6600 Bruceville Road in the South Sacramento Community Plan area. The site is bordered to the north by retail and commercial offices, to the south and west by multi-family residential land uses and a childcare center, and to the east by State Route 99. The site is identified as Assessor's Parcel Numbers (APNs) 117-0170-061, 117-0170-066, 117-0170-067, 117-0170-074 and 117-0170-075.

PROJECT BACKGROUND

On October 26, 1982, the Sacramento City Council granted the necessary discretionary planning entitlements for Kaiser Foundation to establish a major medical center within the South Sacramento community. The first phase included a five-story hospital and a two-story medical office building (MOB 1). Along with construction of a second medical office building (MOB 2) in 1991, the City of Sacramento approved a Master Plan with a planning horizon to 2003. The Master Plan called for twelve phases of growth, and the first nine have lead to the current campus. The tenth phase, the construction of a medical office building (MOB 4) occurred on a new site located south of the campus at the corner of Bruceville Road and Wyndham Drive (P02-075). The eleventh phase, expansion of the D.B. Moore Building for inpatient psychiatric care, was dependent on the regional decision whether or not to outsource this care. However, the delivery of care within the Sacramento area has evolved over the last ten years and inpatient psychiatric care is now subcontracted. Thus, the D.B. Moore psychiatric building was downgraded to medical office occupancies. The twelfth phase was proposed to be an expansion of the hospital nursing units and was initially intended to be developed above the recent Emergency Department addition. However, Kaiser decided to terminate completion of the twelfth phase. Nevertheless, the continued evolution of the Medical Center is based on the City's zoning and general development standards.

PROJECT PURPOSE

To meet the needs of the growing South Sacramento community, the project sponsor seeks to provide additional inpatient bed and preoperative services. The current bed demand for the South Sacramento Medical Center is 128.7 beds and is expected to increase to 185.2 beds by 2007. With a present capacity of 162 beds (102 medical surgical, 20 intensive care, 29 post partum, and 8 neo-natal intensive care), the existing facility is anticipated to be undersized by 12.5 percent by the end of 2007. The proposed project would meet Kaiser's bed and surgical needs through 2012. The proposed project would also address regulatory requirements, provide greater site and strategic flexibility, and resolve existing space deficits.

PROJECT DESCRIPTION

The proposed project would add the following structures to the project site, thereby increasing the entire Kaiser Medical Center to approximately 793,500 square feet:

- An approximately 158,000-square-foot Hospital Tower (basement plus five levels above grade) south of the existing hospital building, containing 96 new medical surgery beds, 20 new intensive care beds, and 20 intensive care beds relocated from the existing hospital.

Additionally, one existing medical surgery bed would be eliminated from the existing hospital, resulting in a total of 115 new hospital beds;

- A two-story, approximately 57,000-square-foot Outpatient Surgery Center (OSC) with a six-room surgery suite constructed west of the new Hospital Tower;
- A five-story approximately 882-space parking structure on the north side of the campus along Bruceville Road. In addition, surface parking lots on the west side of the campus would be constructed to maintain City and Kaiser Permanente parking requirements;
- An addition to the Central Utility Plant consisting of a new single-story approximately 4,000-square-foot chiller addition to support the hospital expansion;
- A single-story, 10,000-square-foot Emergency Department (ED) addition east of the existing ED for possible trauma services;
- A two-story 15,000-square-foot addition to outpatient services on the west side of the existing MOB 1; and
- An emergency helicopter landing pad (Helipad) as part of the new trauma center.

Additional site upgrades include the realignment of segments of the campus ring road, the addition of dedicated pick-up and drop-off zones, the addition of ingress and egress drives, and the improvement of on-site way-finding. Refer to Attachment 2, Site Plan.

The project includes the following City entitlements:

- **Special Permit (Major) Modification** for Outpatient Surgery Center and Hospital Expansion;
- **Special Permit** for Helipad; and
- **Lot Line Adjustment** to abandon easements that are no longer used or needed.

In addition, certain project components would be reviewed and permitted by other public agencies as follows: 1) the proposed Central Utility Plant addition, Emergency Department addition and Hospital Tower would be reviewed and permitted through the Office of Statewide Health Planning and Development (OSHPD); 2) the proposed Outpatient Surgery Center would be reviewed and permitted by the City; however, the City would provide OSHPD with a letter certifying that the building was built per OSHPD 3 requirements; and 3) the proposed Helipad would require an Airspace Determination from the Federal Aviation Administration (FAA), and a Heliport Site Approval Permit from the California Department of Transportation (Caltrans), Division of Aeronautics; however, the Sacramento Area Council of Governments would first review the plans for consistency with the Airport Land Use Commission criteria regarding safety, noise and land-use considerations. The remaining project components, including the parking structure, outpatient services addition, and all site work would be reviewed and permitted by the City.

SECTION III – ENVIRONMENTAL CHECKLIST AND DISCUSSION

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
1. LAND USE *Would the proposal:* A) Result in a substantial alteration of the present or planned use of an area?			✓
B) Affect agricultural resources or operation (e.g., impacts to soils or farmlands, or impact from incompatible land uses?)			✓

ENVIRONMENTAL SETTING

The project site is currently a large hospital campus and is located in the South Sacramento Community Plan Area (SSCP).

The 1988 General Plan designates the site Public/Quasi-Public-Miscellaneous. The site is zoned Hospital with Review Special Classification (H-R). The SSCP designates the site Hospital Zone. The site is bordered on the north by the retail and commercial offices, to the south and west by multi-family residential, and to the east by State Route 99.

STANDARDS OF SIGNIFICANCE

For the purposes of this analysis, an impact is considered significant if the project would substantially alter an approved land use plan that would result in a physical change to the environment. Impacts to the physical environment resulting from the proposed project are discussed in subsequent sections of this document.

ANSWERS TO CHECKLIST QUESTIONS

QUESTION A

The proposed project would be consistent with the General Plan and South Sacramento Community Plan land use designations of Hospital use. Therefore, the proposed project would not result in a substantial alteration of present or planned uses in the area and, therefore, would have a less than significant impact on land uses.

QUESTION B

The project site has been developed for over 20 years as a hospital campus and is surrounded by other urban uses. There is no agricultural land associated with the project site; therefore, the proposed project would have a less than significant impact on agricultural resources or operations.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to land use.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
2. <u>POPULATION AND HOUSING</u> *Would the proposal:* A) Induce substantial growth in an area either directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?			✓
B) Displace existing housing, especially affordable housing?			✓

ENVIRONMENTAL SETTING

The project site is located in an area surrounded by existing development and is designated for hospital use. The area around the project site is developed with transportation, multi-family housing, and commercial uses.

STANDARDS OF SIGNIFICANCE

For the purposes of this analysis, an impact is considered significant if the project would induce substantial growth that is inconsistent with the approved land use plan for the area or displace existing affordable housing.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A AND B

The proposed project would be expand an existing medical center in a developed area consistent with the General Plan and SSCP. The project would help serve a growing residential population, but would not directly or indirectly induce substantial growth on its own. In addition, there is no existing housing that would be displaced by the project. Therefore, no impacts would occur.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to population and housing.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
3. SEISMICITY, SOILS, AND GEOLOGY Would the proposal result in or expose people to potential impacts involving: A) Seismic hazards?			✓
B) Erosion, changes in topography or unstable soil conditions?			✓
C) Subsidence of land (groundwater pumping or dewatering)?			✓
D) Unique geologic or physical features?			✓

ENVIRONMENTAL SETTING

The project site lies at an elevation of approximately 20 feet above mean sea level (msl) on historic floodplains that have been altered to allow for agricultural and urban uses. The surface geology within the project area consists of Pleistocene Alluvium (Victor Formation). The soil type in the project vicinity is depicted as San Joaquin-Galt, which is defined as moderately deep, well-drained soils that are underlain by cemented hardpan, and moderately well-drained soils that have a clayey texture (SGPU DEIR, T-2, 5).

The project site is located in the central portion of the Great Valley geomorphic province of California. The Great Valley lies between the Sierra Nevada Range to the east and the California Coast Ranges to the west. The geological formations of the Great Valley are typified by thick sequences of alluvial sediments (up to two-mile depth) deposited during the filling of a large ancient basin (Wallace Kuhl, 1994). No geologic features such as faults or Alquist-Priolo special studies zones are known to occur in or near the project area. Development within this area is subject to potential damage from earthquake ground shaking at a maximum intensity of VIII on the Modified Mercali Scale (SGPU DEIR, T-3, 16).

The project site is currently covered with buildings, concrete sidewalks, landscaping and asphalt parking lots, with the exception of Parking Lots 14 and 15 (Refer to Attachment 2, Site Plan), which are covered with gravel. The proposed project would convert those two parking lots to asphalt in accordance with current City standards.

STANDARDS OF SIGNIFICANCE

For the purposes of this analysis, an impact is considered significant if it allows a project to be built that will either introduce geologic or seismic hazards by allowing the construction of the project on such a site without protection against those hazards.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A - D

The proposed project would result in the exposure of people to geologic or seismic hazards. All structures built would be constructed to current Uniform Building Code standards, which would minimize the potential for damage due to ground shaking. The project site has already been developed and, therefore, would involve minimal grading and compaction of the site.

Some erosion may occur as a result of the minimal grading of the site. Soils are especially prone to erosion from storm water runoff that occurs during or immediately after construction. All grading and erosion control would be conducted in compliance with the requirements of Chapter 15.88 (Grading, Erosion and Sediment Control) of the Sacramento City Code. This Chapter would require the project sponsor to show erosion and sediment control methods on the project improvement plans. These plans would also be required to show methods to control urban runoff pollution from the project site during construction.

According to the project engineer, test borings up to 60 feet in depth did not encounter groundwater, and historical information indicates that groundwater is between 53 and 66 feet deep.[1] Since groundwater is significantly below the finished floor elevation and grade level of the proposed project, construction would not require groundwater pumping or dewatering. There are no recognized unique geologic features or physical features that would be impacted by construction of the proposed medical center expansion. Therefore, related impacts on area soils and earth conditions would be less than significant.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to seismicity, soils and geology.

[1] David A. Wilson, Division Manager – Site Development, Mark Thomas & Company, Inc., E-mail communication to Mike Monson, Project Director, Lionakis Beaumont Design Group, Inc., October 18, 2005.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
4. <u>WATER</u> Would the proposal result in or expose people to potential impacts involving: A) Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?			✓
B) Exposure of people or property to water related hazards such as flooding?			✓
C) Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity)?			✓
D) Changes in currents, or the course or direction of water movements?			✓
E) Change in the quantity of ground waters, either through direct additions or withdrawal, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capability?			✓
F) Altered direction or rate of flow of groundwater?			✓
G) Impacts to groundwater quality?			✓

ENVIRONMENTAL SETTING

Surface Water/Drainage. The aquifer system underlying the City is part of the larger Central Valley groundwater basin. The Sacramento, American and Cosumnes Rivers are the main surface water tributaries that drain much of Sacramento and recharge the aquifer system. Surface inflows to the east of the City limits and deep percolation of precipitation and surface water applied to irrigated agricultural land recharge the aquifer system. The project site is adjacent to the channelized Union House Creek.

Water Quality. The City's municipal water is received from the American and Sacramento Rivers. The water quality of the American River is considered very good. The Sacramento River water is also considered to be of good quality, although higher sediment loads and extensive irrigated agricultural land upstream of Sacramento tend to degrade the water quality. During the spring and fall, irrigation tailwaters are discharged into drainage canals that flow to the river. In the winter, runoff flows over these same areas. In both instances, flows are highly turbid and introduce large amounts of herbicides and pesticides into the drainage canals, particularly rice field herbicides in

May and June. The aesthetic quality of the river is changed from relatively clear to turbid from irrigation discharges.

Water quality of the drainage tributaries is also affected by other pollutants, such as runoff from urban storm drains and illegal dumping in creeks and drainageways (SGPU DEIR, W-11). Therefore, to maintain high quality, it is imperative to reduce sedimentation and erosion into the tributaries. The Sacramento General Plan Update Draft Environmental Impact Report (SGPU DEIR) includes a number of precautionary construction measures to maintain water quality. These measures include: minimizing surface disturbance as much as possible; placing mulch and reseeding/revegetating disturbed areas; enforcing strict on-site soil handling rules; collection and removal of pollutants such as petroleum products from the job site; maintaining riparian vegetation to the maximum extent feasible; using appropriate sanitation to avoid bacterial and nutrient contamination; and preparation of a spill prevention plan in the event of an accidental materials spill (SGPU DEIR, W-16, 17). The State Water Resources Control Board (SWRCB) has primary responsibility for protecting the quality of surface and groundwaters within the City. The SWRCB's efforts are generally focused on preventing either the introduction of new pollutants or an increase in the discharge of existing pollutants into bodies of water that fall under its jurisdiction. The proximity of the Sacramento and American Rivers to the project site and the existence of both a shallow water table and deep aquifer beneath the area keep the SWRCB interested in activities in the area.

Flooding. The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRM) that delineate flood hazard zones for communities. The project site is currently within an area designated Zone X by a Letter of Map Revision (LOMR) to the City's FIRM (dated July 6, 1998), issued by FEMA on May 22, 2000. This zone is applied to areas of the City, which are outside of the 100-year and 500-year flood hazard area.

Groundwater. The project site is located within the Sacramento River Hydrologic Basin, as defined by the California Department of Water Resources. Groundwater elevation measurements in the vicinity of the project site have fluctuated from approximately 58 feet to 71 feet below the ground surface (Wallace-Kuhl and Associates, 1994).

STANDARDS OF SIGNIFICANCE

Water Quality. For purposes of this environmental document, an impact is considered significant if the proposed project would substantially degrade water quality and violate any water quality objectives set by the State Water Resources Control Board, due to increased sediments and other contaminants generated by consumption and/or operation activities.

Flooding. Substantially increase exposure of people and/or property to the risk of injury and damage in the event of a 100-year flood.

ANSWERS TO CHECKLIST QUESTIONS

QUESTION A

The proposed project would not change the existing absorption rate, drainage pattern or rate and amount of surface runoff because the area of impervious surface on the site would not change. The project site currently has an on-site surface drainage system consisting of bioswales and storm drains that connect to the City's storm drain system. The project proposes an on-site detention system to capture stormwater and treat it before it enters the City's storm drain system. The system would consist of several bioswales and a City-approved water quality vault below the landscape area between the proposed parking structure and Bruceville Road on the northeast corner of the project site. Therefore, the proposed project would have a less than significant impact.

QUESTION B

Due to the location of the project site in Zone X, implementation of the project would not expose people and/or property to water-related hazards such as flooding. Therefore, the proposed project would have a less than significant impact.

QUESTION C

Construction related activities have the potential to impact water quality. Fuel, oil, grease, solvents and other chemicals used in construction activities have the potential to create toxicity problems if allowed to enter a waterway. Construction activities are also a source of various other materials including trash, soap and sanitary wastes.

Construction activities associated with the proposed project would include removal of any excess soil, grading and compacting soil, and trenching for the buildings, parking lots, parking structure and landscaping. The degree of construction related impacts to water quality is partially determined by the duration of the various construction activities and rainfall distribution. Due to low summer rainfall, summer construction activities would decrease sediment and other pollutant levels that may impact water quality. Furthermore, project improvement plans would be required to comply with the City's Grading, Erosion, and Sediment Control Ordinance (Chapter 15.88). Additionally, since the project site is over one acre, the project sponsor would be required to comply with the State's National Pollution Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity. To comply with the NPDES Permit, the project sponsor would need to file a Notice of Intent with the SWRCB and prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to construction. The SWPPP must include Best Management Practices (BMPs), such as drop inlet protection devices, vegetation erosion control measures (i.e., mulching, grassy swales, or seeding/planting), physical stabilization and sediment control measures or equally effective BMPs, which would protect receiving waters from potential discharges of contaminants and soil during construction. The bioswales and underground vault described above in response to Question A are considered BMPs because they would filter the storm water before it enters the City's storm drainage system.

Therefore, water quality impacts would be less than significant.

QUESTION D

The proposed project would not change the current or course or direction of water movements, because the project site is currently paved and covered with structures and does not contain a stream, river or creek.

QUESTIONS E, F AND G

The project site is entirely developed and covered with impervious surface. The proposed project would not change the quantity of groundwater by directly adding or withdrawing water or by intercepting an aquifer or affecting the groundwater recharge capacity because the project would not change the total amount of paved surface on the site. In addition, excavation for the proposed project would not reach the groundwater table during construction, and dewatering would not be required. Because the City is an urbanized area and largely covered in impervious surfaces, groundwater recharge to the local aquifers is through open space land uses surrounding the City and from the American and Sacramento Rivers. The proposed project would not alter the direction or rate of flow of groundwater, because the site is currently paved and the project would not change the amount of impervious surface. The proposed project would not affect groundwater quality because the site conditions that affect groundwater quality, such as pollutants filtering into the groundwater from the surface, would not change after project implementation.

The proposed project would be served through the City's water supply system, which relies entirely on Sacramento and American River water. The proposed project would not use groundwater resources during project operation. Therefore, the proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of local groundwater table level.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts on water resources.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
5. AIR QUALITY *Would the proposal:* A) Violate any air quality standard or contribute to an existing or projected air quality violation?	✓		
B) Exposure of sensitive receptors to pollutants?	✓		
C) Alter air movement, moisture, or temperature, or cause any change in climate?			✓
D) Create objectionable odors?			✓

ENVIRONMENTAL SETTING

The project area is located in the Sacramento Valley, which is bounded by the Sierra Nevada on the east and the Coast Range on the west. Prevailing winds in the project area originate primarily from the southwest. These winds are the result of marine breezes coming through the Carquinez Straits and diminish during the winter months; winds from the north occur more frequently at this time.

Air quality within the project area and surrounding region is largely influenced by urban emission sources. As there are minimal industrial emissions, these sources originate primarily from automobiles. Home fireplaces also contribute a significant portion of the air pollutants, particularly during the winter months. Air quality hazards are caused primarily by carbon monoxide (CO), particulate matter (PM_{10}), and ozone. In 1998, the Sacramento area was within U.S. Environmental Protection Agency (EPA) attainment standards for all pollutants except ozone, which exceeded state standards on 42 days of the year. Although the Sacramento Metropolitan Air Quality Management District (SMAQMD) is a non-attainment area for PM_{10}, it has not exceeded state or federal standards since 1991 (California Air Resources Board, 1999).

REGULATORY REQUIREMENTS

Air quality in the area surrounding the proposed project is regulated by the EPA, the California Air Resources Board (CARB), and SMAQMD. These agencies develop rules and regulations to meet the goals or directives imposed on them through legislation. Since many air pollution problems are regional in nature, the federal government sometimes designates multi-county areas as "Nonattainment Areas." Because it covers a large area, a nonattainment area can be composed of several different air districts. This designation means that individual local agencies must work together to solve regional air pollution problems. The Sacramento Ozone Nonattainment Area includes all of Sacramento County and parts of Yolo, Solano, Sutter and Placer Counties.

Federal

The EPA is the federal agency responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. The EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs.

Clean Air Act

The Federal Clean Air Act (CAA), as amended, establishes air quality standards for several pollutants. These standards are divided into primary standards and secondary standards. Primary standards are designed to protect public health, and secondary standards are intended to protect public welfare from effects such as reduced visibility, soiling, nuisance, and other forms of damage. The CAA requires that regional plans be prepared for nonattainment areas illustrating how the federal air quality standards could be met. The CARB approved the most recent revision of the SIP in 1994, and it was approved by the EPA in 1996. The SIP consists of a list of reactive organic gas (ROG) and nitrogen oxide (NO_x) control measures for demonstrating future attainment of ozone standards.

Ozone Standards

The federal eight-hour ozone standard was established in response to human health studies indicating that longer ozone exposures at lower levels also resulted in adverse health effects, including coughing, increased asthma attacks, chronic lung inflammation, decreased lung function, and decreased lung defenses against bacterial infections. The federal eight-hour and the state's one- and eight-hour ozone standards apply. The Sacramento area has already been designated as "serious" for the eight-hour standard.

Federal Ozone Attainment Plan

The Sacramento Valley Air Basin (SVAB) is subject to a Federal Ozone Attainment Plan (the Sacramento Area Regional Ozone Attainment Plan). This plan was adopted by five air districts in the Sacramento area in order to build upon existing state and local air quality programs. The Plan contains adopted measures, implementation and adoption schedules for new measures, emission inventories, modeling results, contingency measures, and emissions reduction demonstrations that guide reduction of emissions in the Sacramento Region. The region has an attainment date of June 2013 for the eight-hour standard. Currently, the eight-hour attainment plan is scheduled to be adopted by April 2007.

State

California Clean Air Act

The California Clean Air Act (CCAA) of 1988 requires nonattainment areas to achieve and maintain the state ambient air quality standards by the earliest practicable date and local air districts to develop plans for attaining the state ozone, carbon monoxide, sulfur dioxide and nitrogen dioxide standards. In compliance with the CCAA, the SMAQMD prepared and submitted the 1991 Air Quality Attainment Plan (AQAP) to mainly address Sacramento County's nonattainment status for ozone and carbon monoxide (CO), and although not required, PM_{10}.

Toxic Air Contaminants

Regulation of Toxic Air Contaminants (TACs) is achieved through federal and state controls on individual sources. The 1990 federal CAA Amendments offer a comprehensive plan for achieving significant reduction in both mobile and stationary source emissions of certain designated Hazardous Air Pollutants

The Air Toxics Hot Spots Information and Assessment Act of 1987 (Assembly Bill [AB] 2588), California Health and Safety Code Section 44300 et seq, provides for the regulation of over 200 air toxics and is the primary air contaminant legislation in California. The purpose of AB 2588 is to identify and inventory toxic air emissions and to communicate the potential for adverse health effects to the public.

AB 1807, enacted in September 1983, sets forth a procedure for the identification and control of TACs in California. AB 1807 defines a TAC as an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. The CARB prepares identification reports on candidate substances under consideration for listing as TACs.

The CARB has recently identified diesel particulate matter as a toxic air contaminant under the AB 1807 program. Diesel particulate matter is emitted into the air via heavy-duty diesel trucks, construction equipment and passenger cars. In October 2000, the CARB released the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. This plan identifies diesel particulate matter as the predominant TAC in California and proposes methods for reducing diesel emissions.

Local

SMAQMD

The SMAQMD is the primary agency responsible for planning to meet federal and state ambient air quality standards in SVAB. In order to demonstrate the area's ability to eventually meet the federal ozone standards, the SMAQMD, along with the other air districts in the nonattainment area, maintain the region's portion of the SIP for ozone. The SVAB's part of the SIP is a compilation of regulations that govern how the region and state will comply with the CAA requirements to attain and maintain the federal ozone standard. The compilation of rules that comprises the Sacramento Nonattainment Area's portion of the SIP is contained in a document called the Sacramento Area Regional Ozone Attainment Plan. The most recent update of the Plan was adopted on November 15, 1994. Currently, the SMAQMD is working to update the 1994 Plan in recognition of the new federal eight-hour standard for ozone. This process is currently ongoing.

For PM_{10}, the other criteria pollutant of concern for the Sacramento Region, Sacramento currently meets the federal standard, but has not yet been officially re-designated to attainment by the EPA. Since monitoring data shows that the PM_{10} standard is being met in practice, no PM_{10} plan exists in the SMAQMD.

Local Air District Rules

The SMAQMD has several rules that relate to the proposed project, including regulations on air contaminant discharges, fugitive dust, architectural coatings, adhesives and sealants, and limits on NO_x and CO emissions from institutional facilities.

STANDARDS OF SIGNIFICANCE

Ozone and Particulate Matter. An increase of either ozone precursor, NO_x or ROG, above 85 pounds per day for short-term effects (construction) would result in a significant impact and an increase of PM_{10} above 275 pounds per day would result in a significant impact and require mitigation. An increase of either ozone precursor, NO_x or ROG, above 65 pounds per day for long-term effects (operation) would result in a significant impact (as revised by SMAQMD, March 2002).

Carbon Monoxide. The pollutant of concern for sensitive receptors is carbon monoxide (CO). Motor vehicle emissions are the dominant source of CO in Sacramento County (SMAQMD, 1994). For purposes of environmental analysis, sensitive receptor locations generally include parks, sidewalks, transit stops, hospitals, rest homes, schools, playgrounds and residences. Carbon monoxide concentrations are considered significant if they exceed the one-hour state ambient air quality standard of 20.0 parts per million (ppm) or the eight-hour state ambient standard of 9.0 ppm (state ambient air quality standards are more stringent than their federal counterparts).

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A AND B

The existing medical center does not incinerate waste on-site, nor would any component of the proposed project. However, the project may contribute to an existing air quality violation and result in the exposure of sensitive receptors to pollutants. These potentially significant impacts will be studied in the EIR to be prepared for the project.

QUESTION C

The project would not result in the alteration of air movement, moisture, or temperature, or in any change in climate, either locally or regionally. Therefore, a less than significant impact would result.

QUESTION D

Construction equipment and materials may emit odors perceptible to residents within the project vicinity. However, any construction-related odors would be localized to the immediate vicinity of construction operations, and would be temporary (occurring only during active construction). Operation of the project would not create permanent objectionable odors, including the chiller addition. Therefore, the impact would be less than significant.

MITIGATION MEASURES

Mitigation measures for potentially significant impacts will be identified in the EIR to be prepared for the project.

FINDINGS

The proposed project may result in potentially significant air quality impacts.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
6. TRANSPORTATION/CIRCULATION Would the proposal result in: A) Increased vehicle trips or traffic congestion?	✓		
B) Hazards to safety from design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			✓
C) Inadequate emergency access or access to nearby uses?			✓
D) Insufficient parking capacity on-site or off-site?			✓
E) Hazards or barriers for pedestrians or bicyclists?			✓
F) Conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			✓
G) Rail, waterborne or air traffic impacts?			✓

ENVIRONMENTAL SETTING

Roads. The project site is situated between Bruceville Road and Wyndham Drive, and bordered by Valley Hi Drive to the west. Wyndham Drive is an east-west, two-lane facility. Bruceville Road is a north-south, four-lane facility. Valley Hi Drive is a four-lane facility. Bruceville Road connects with State Route 99. State Route 99 provides regional access to the project site.

Regional Transit. Regional Transit is the major public transportation service provider within Sacramento County providing 20 miles of light rail service and fixed-route bus service on 65 routes. Light rail service and many of the bus routes are currently oriented to the downtown area. Two bus routes operate on Wyndham Drive (#55 and #56). Route 55 provides service between Cosumnes River College and Florin Mall Monday through Friday. It also provides services on Sunday and holidays specifically from Kaiser Hospital to Florin Mall. Route 56 provides service between Elk Grove and Downtown Sacramento on weekdays and Saturdays.

Bikeways. Class II, on-street bike lanes exist on Wyndham Drive and Valley Hi Drive. Also, a future bike lane is planned on Bruceville Road, per the 2010 City/County Bikeway Master Plan, 1995, as amended.

Parking. Multiple (17) on-site surface parking lots currently serve the project site providing approximately 2,040 spaces including approximately 55 handicap accessible spaces.

STANDARDS OF SIGNIFICANCE

Roadway Traffic. An impact is considered significant for roadways or intersections when the project causes the facility to change from LOS C or better to LOS D or worse. For facilities that are, or will be worse than LOS C without the project, an impact is also considered significant if the project: 1) increases the average delay by five seconds or more at an intersection, or 2) increases the volume to capacity ratio by .02 or more on a roadway.

Bikeways. An impact is considered significant if implementation of the project will disrupt or interfere with existing or planned bicycle or pedestrian facilities or result in an unsafe condition for bicyclists.

Regional Transit. An impact is considered significant if the project will cause transit boardings to increase beyond the crush load a transit vehicle or it the project will cause a ten percent or greater increase in travel time along any route.

Parking. A significant impact to parking would occur if the anticipated parking demand of the project exceeds the available or planned parking supply.

ANSWERS TO CHECKLIST QUESTIONS

QUESTION A

The proposed project would result in increased vehicle trips and traffic congestion. This impact would be potentially significant and will be studied in the EIR to be prepared for the project.

QUESTIONS B AND C

The proposed project would conform to the City's Street Design and Procedures Manual, which includes standards for driveways, curbs and gutters, stopping site distance, and streetscape landscaping and improvements to ensure a safe roadway facility with a functional use for vehicles, bicycles and pedestrians. Also, the City's Design Standards (Sacramento Municipal Code Section 16.40) requires design features that minimize the potential for accidents in parking structures, such as including designated access drives, internal maneuvering and queuing areas, vertical clearance for convenience, safety and efficient circulation. The proposed project would conform to the standards of the Municipal Code and would not substantially increase hazards due to a design feature or incompatible use.

In addition, the proposed project would conform to the standards of the Sacramento Fire Protection District for roadways and vertical clearance to ensure adequate emergency access to the project site. Therefore, impacts would be less than significant.

QUESTIONS D AND E

The proposed project would construct a new five-story, 882-space parking structure, which would add 540 new spaces to the campus. There are currently 2,040 parking spaces on the project site, although nine spaces would be removed to accommodate expansion of MOB 1. The resulting number of parking spaces would total 2,575, which would meet Kaiser's development standards and exceed the number of spaces (2,074) required by the City. The new parking structure would be located adjacent to the area of largest demand, the medical office buildings.

A traffic control plan during construction would ensure a less than significant impact on parking capacity and hazards for pedestrians or bicyclists.

QUESTIONS F AND G

The bus routes that currently travel on Wyndham Drive would not be re-routed. During construction, a traffic control plan would be in place to avoid obstruction of transit operations. The existing bus stops would not need to be relocated during or after construction. Project plans include a pedestrian walkway from the bus stops on Wyndham Road to the entrance of the building.

Current bicycle routes on Valley Hi Drive and Wyndham Road, and a future route on Bruceville Road would not be obstructed during construction because a traffic control plan would be in place to avoid conflicts with bicyclists and pedestrians. Bicycle parking would be located within the parking lot for staff and patients.

As a requirement under City of Sacramento Code Chapter 18.12, each work site with 100 or more employees must submit a Transportation Management Plan (TMP) with Transportation Systems Management measures for the specific site. Such measures include designated parking for carpoolers and bike racks. The goal of this chapter is to encourage 35 percent of peak period commuters to use alternative travel modes, by means other than a single-occupant vehicle during peak periods. The 35 percent alternative mode goal applies to the total number of employees commuting during peak periods from all sites of the major employers. The project sponsor has prepared an updated TMP, which includes the proposed hospital expansion and would be approved by the City prior to issuance of building permits.

The project site is not within an airport land use plan or within two miles of a public airport or private airport. Therefore, the proposed project would not result in a safety hazard for people residing or working in the project area. The proposed Helipad would be used for emergency purposes and would be designed as required by the Department of Transportation, Federal Aviation Administration, Helicopter Design Advisory Circular 150/5390-2, and Title 21, Division of Aeronautics. In addition, it would be designed to support a minimum of 10,000 pounds. The project would be required to obtain a Heliport Site Approval Permit from Caltrans Division of Aeronautics, which would include a review of flight approach and departure paths. Compliance with the requirements of the permit and design standards from the above agencies would ensure that the Helipad would not pose a substantial risk to people in the area.

Existing emergency vehicle routes would remain the same with project implementation. Currently, emergency vehicles enter the medical center from the east off Bruceville Road, between Parking Lots 5 and 8. This entrance is also used most by visitors and staff to the medical offices, and would not change with project implementation. The helicopter routes would most likely follow State Route 99 and enter the medical center from the east. Emergency vehicle and helicopter routes would not pose a substantial risk to people in the area.

The project would not conflict with adopted policies supporting alternative transportation nor result in rail, waterborne or air traffic impacts. Therefore, the proposed project would have a less than significant impact.

MITIGATION MEASURES

Mitigation measures for potentially significant impacts will be identified in the EIR to be prepared for the project.

FINDINGS

The proposed project may result in potentially significant transportation/circulation impacts.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
7. <u>BIOLOGICAL RESOURCES</u> Would the proposal result in impacts to: A) Endangered, threatened or rare species or their habitats (including, but not limited to plants, fish, insects, animals and birds)?			✓
B) Locally designated species (e.g., heritage or City street trees)?			✓
C) Wetland habitat (e.g., marsh, riparian and vernal pool)?			✓

ENVIRONMENTAL SETTING

Information in this section was obtained from the Site Tree Inventory prepared by Lionakis Beaumont Design Group, Inc., dated November 30, 2004 (see Appendix), and a search of the 2005 California Natural Diversity Database (CNDDB) by RBF Consulting on October 18, 2005.

The project site is completely developed with minimal landscaping and located in an urbanized area. The site is bordered to the north and east by Bruceville Road, to the south by Wyndham Drive, and to the west by Valley Hi Drive. Vegetation on the site consists of turf areas and ornamental shrubs, and over 1,100 ornamental trees. Trees on the site include 245 Japanese hackberry (*Celtis sinensis*), 218 northern red oak (*Quercus rubra*), 95 Chinese pistachio (*Pistacia chinensis*), 56 Italian alder (*Alnus cordata*), 48 interior live oak (*Quercus wisilzenii*), 36 coast redwood (*Sequoia sempervirens*), 13 European white birch (*Betula pendula*), 11 Japanese maple (*Acer palmatum*), 7 valley oak (*Quercus lobata*), and 4 stone pine (*Pinus pinea*), among others. Most of the trees range between 6-12 inches in diameter, with the largest trees (Italian alder and stone pine) up to 24 inches.

Trees on the interior of the project site, outside the City's right-of-way, would not be subject to the City's Tree Ordinance, as defined by City Ordinance Chapter 12.56, Trees Generally, and Chapter 12.64, Heritage Trees (discussed below). However, the proposed project could require the removal of, or result in damage to, street trees, which would require compliance with the ordinance.

Urban wildlife near the site is limited to badger (*Taxidea taxus*). The CNDDB query revealed recorded occurrences of the following within the Florin 7.5-minute topographic quadrangles (which includes the project site):

- Four special status plants: dwarf downingia (*Downingia pusilla*), Boggs Lake hedge (*Gratiola heterosepala*), legenere (*Legenere limosa*), and Sanford's arrowhead (*Sagittaria sanfordii*);
- One special status tree: Northern California black walnut (*Juglans hindsii*);
- Four special status birds: tricolored blackbird (*Agelaius tricolor*), borrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), and white-tailed kite (*Elanus leucurus*);
- Four special status invertebrates: vernal pool fairy shrimp (*Branchinecta lynchi*), midvalley fairy shrimp (*Branchinecta mesovallensis*), vernal pool tadpole shrimp (*Lepidurus packardi*), and California linderiella (*Linderiella occidentalis*);
- Two special status vertebrates: northwestern pond turtle (*Emys marmorata marmorata*), and giant garter snake (*Thamnophis gigas*);
- One special status fish: Sacramento splittail (*Pogonichthys macrolepidotus*); and
- One sensitive habitat: Northern hardpan vernal pool.

All of the above species have specific habitat requirements that are not present on the project site. Because the site is developed, it provides no forging habitat for any of the birds or any nesting habitat for burrowing owls. The nearest occurrence of Swainson's hawk is five miles from the project site. Given the absence of forging habitat and the high disturbance associated with the urban setting, it is unlikely that the large trees on the site could serve as nesting sites for Swainson's hawk.

SPECIAL-STATUS SPECIES

Definitions of Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized in some fashion by federal, state or other agencies as deserving special consideration. Some of these species receive specific legal protection pursuant to federal or state endangered species legislation. Others lack such legal protection but have been characterized as "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities and special districts to meet local conservation objectives. These species are referred to collectively as "special-status species," following a convention that has developed in practice but has no official sanction. The various categories encompassed by the term are presented below:

- Plants or animals listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (ESA) (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [FR] [proposed species]);

- Plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);

- Plants or animals designated as "special concern" (former C2 candidates) by Region 1 of the U.S. Fish and Wildlife Service (USFWS);

- Plants or animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
- Plants that meet the definitions of rare and endangered under CEQA (State CEQA Guidelines, Section 15380);
- Plants considered under the California Native Plant Society (CNPS) to be "rare, threatened or endangered in California" (Lists 1A, 1B, and 2 in CNPS 2001);
- Plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2001), which may be included as special-status species on the basis of local significance or recent biological information;
- Animal species of special concern to California Department of Fish and Game (CDFG); and
- Animals fully protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

HABITATS AND VEGETATION COMMUNITIES

Most of the site is covered by impervious surfaces (buildings, parking lots) with minimal landscaping. Landscaping is comprised primarily of non-native trees such as beech, oak, alder and Japanese hackberry.

WETLANDS AND WATERS OF THE U.S.

The U.S. Army Corps of Engineers (ACOE) has primary federal responsibility for administering regulations that concern "waters of the U.S.," including wetlands, within the project area. The ACOE requires that a permit be obtained if a project proposes placing structures within, over or under navigable waters and/or discharging dredged or fill material into waters of the U.S. below the ordinary high-water mark in non-tidal waters. The Environmental Protection Agency (EPA), USFWS, National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries), and local regulatory agencies provide comment on ACOE permit applications.

The state's authority in regulating activities in waters of the U.S. resides primarily with the CDFG and the State Water Resources Control Board (SWRCB). CDFG provides comments on ACOE permit actions under the Fish and Wildlife Coordination Act. CDFG is also authorized under the California Fish and Game Code Sections 1600-1607 to develop mitigation measures and enter into Streambed Alteration Agreements (SAA) with applicants who propose projects that would obstruct the flow of, or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams. The SWRCB, acting through the Regional Water Quality Control Board (RWQCB), must certify that an ACOE permit action meets state water quality objectives (Section 401, Clean Water Act).

California Fish and Game Code Sections 1600-1607 require the notification of CDFG for any activity that could affect the bank or bed of any stream that has value to fish and wildlife. Upon notification, the CDFG has the responsibility to prepare an SAA, in consultation with the project sponsor.

In a jurisdictional sense, there are two definitions of a wetland: one definition adopted by the ACOE (the federal agency with jurisdiction over wetlands) and a separate definition adopted by the State of California. Under normal circumstances, the federal definition of wetlands requires three wetland identification parameters (hydrology, soils and vegetation) to be met, whereas the state adopted definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by the CDFG consists of the union of all areas that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present. The CDFG does not normally have direct jurisdiction over wetlands unless they are subject to jurisdiction under an SAA or they support state-listed endangered species; however, the CDFG has trust responsibility for wildlife and habitats pursuant to California law.

MIGRATORY BIRD TREATY ACT

The federal Migratory Bird Treaty Act regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 Code of Federal Regulations (CFR) Section 10.13. This international treaty for the conservation and management of bird species that migrate through more than one country is enforced in the United States by the USFWS. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50 CFR 20. The Migratory Bird Treaty Act was amended in 1972 to include protection for migratory birds of prey (raptors).

FISH AND GAME CODE – SECTIONS 3503, 3503.5, 3513

Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Fish and Game Code 3503.5 protects all birds-of-prey (raptors)_and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act.

HERITAGE TREES

City Code Chapter 12.64 (Heritage Trees) defines Heritage Trees as trees meeting any of the following conditions:

(1) Any species with a trunk circumference of one hundred inches or more, which is of good quality in terms of health, vigor of growth, and conformity to generally accepted horticultural standards of shape and location for its species;
(2) Any native *Quercus* species, *Aesculus californica*, or *Platanus racemosa* having a circumference of 36 inches or greater when a single trunk, or a cumulative circumference of 36 inches or greater when a multi-trunk;
(3) Any tree 36 inches or greater in circumference or greater in a riparian zone; and
(4) Any tree, grove of trees, or woodland trees designated by resolution of the City Council to be of special historical or environmental value, or of significant community benefit.

None of the following activities are allowed unless a permit is first applied for by the property owner or person authorized by the property owner and granted by the Director of the Parks and Recreation Department, subject to appeal provisions:

(1) The removal of any Heritage Tree;
(2) Pruning of any Heritage Tree segment greater than twelve inches in circumference or the placement of any chemical or other deleterious substance by spray or otherwise on any heritage tree; or

(3) Disturbing the soil or placing any chemical or other deleterious substance or material on the soil within the drip line area of any Heritage Tree.

TREE PRESERVATION ORDINANCE

The City of Sacramento has adopted an ordinance to protect trees as a significant resource to the community. It is the City's policy to retain trees when possible regardless of their size. When circumstances will not allow for retention, permits are required to remove trees that are within City jurisdiction. Removal of, or construction around, trees that are protected by the Tree Preservation Ordinance are subject to permission and inspection by City arborists. The City of Sacramento Tree Service Division reviews project plans and works with City of Sacramento Public Works during the construction process to minimize impacts to street trees in the City.

STANDARDS OF SIGNIFICANCE

For purposes of this environmental document, an impact would be significant if any of the following conditions or potential thereof, would result with implementation of the proposed project:

- Creation of a potential health hazard, or use, production or disposal of materials that would pose a hazard to plant or animal populations in the area affected;
- Substantial degradation of the quality of the environment, reduction of the habitat, reduction of population below self-sustaining levels of threatened or endangered species of plant or animal;
- Affect other species of special concern to agencies or natural resource organizations (such as regulatory waters and wetlands); or
- Violate the Heritage Tree Ordinance (City Code Chapter 12.64.040).

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A - C

The CNDDB search identified 17 special-status plant and wildlife species occurring within the Florin quadrangle, none of which were recorded within the project site. As discussed above, only Swainson's hawk could potentially use the site for nesting. However the nearest recorded occurrence was approximately five miles from the project site.

According to the Tree Survey, no Heritage Trees are located on the project site. The project site may contain street trees, and the removal of those during project implementation would be subject to the City's Tree Ordinance. Therefore, the proposed project would have a less than significant impact on endangered, threatened or rate species or their habitat, wetlands or Heritage Trees.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts on biological resources.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
8. <u>ENERGY</u> Would the proposal result in impacts to: A) Power or natural gas?			✓
B) Use non-renewable resources in a wasteful and inefficient manner?			✓
C) Substantial increase in demand of existing sources of energy or require the development of new sources of energy?			✓

ENVIRONMENTAL SETTING

Gas. Gas service is supplied to the City of Sacramento and the project site by Pacific Gas and Electric (PG&E).

Electricity. Electricity is supplied to the City of Sacramento and the project site by the Sacramento Municipal Utility District (SMUD). A SMUD substation is located in the eastern portion (Lot 8) of the project site.

Underground Service Alert (USA). The City of Sacramento is a member of the USA one-call program. Under this program, a contractor is required to notify the USA 48 hours in advance of performing excavation work. A developer has the responsibility for timely removal, relocation, or protection of any existing utility services located on the site of any construction project.

STANDARDS OF SIGNIFICANCE

Gas Service. A significant environmental impact would result if a project would require PG&E to secure a new gas source beyond their current supplies.

Electrical Services. A significant environmental impact would occur if a project resulted in the need for a new electrical source (e.g., hydroelectric and geothermal plants).

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A, B, AND C

The project would consume fossil fuels during construction. All construction equipment would be maintained and tuned at the interval recommended by the manufacturers to ensure efficient use of fuel; however, construction activities related to the proposed project would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels, natural gas, and gasoline for automobiles and construction equipment.

The proposed project would require increased energy to operate the additional hospital facilities. However, the proposed project would include lighting and other energy conservation measures and would construct all structures with up-to-date energy-saving equipment. Lighting conservation efforts in new construction include installation of occupancy sensors to automatically turn off lights when not in use, lighting reflectors, electronic ballasts, and energy-efficient lamps. In addition, compliance with all applicable building codes, planning policies, and standard conservation features, would ensure that all natural resources are conserved to the maximum extent possible.

Electricity for the proposed project would be provided by SMUD. SMUD has indicated that there would be sufficient capacity to supply the project and no new source of energy would be required.[2] Also, the 4,000-square-foot chiller addition to the Central Utility Plant would support the project's emergency energy needs.

PG&E has indicated that existing facilities in the area could adequately serve the proposed project and no new natural gas supplies would need to be obtained.[3]

Although resources would be permanently and continually consumed by the proposed project, the amount and rate of consumption of these resources would not result in the unnecessary, inefficient or wasteful use of energy. Therefore, the proposed project's impact to energy resources would be less than significant.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to energy resources.

[2] Richard Ramirez, Sacramento Municipal Utilities District, Personal communication, October 20, 2005.
[3] Dwayne LaMonde, Pacific Gas and Electric Company, Personal communication, October 20, 2005.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
9. HAZARDS *Would the proposal involve:* A) A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation)?			✓
B) Possible interference with an emergency evacuation plan?			✓
C) The creation of any health hazard or potential health hazard?			✓
D) Exposure of people to existing sources of potential health hazards?			✓
E) Increased fire hazard in areas with flammable brush, grass, or trees?			✓

ENVIRONMENTAL SETTING

The project site has been a developed with a medical center for over 20 years. There is no evidence of hazardous materials contamination on the project site. The medical center currently produces waste typical of a hospital, such as syringes, needles (hypodermic and sutures), used and contaminated biohazard tubing (IVs and catheters), scalpel blades, used gowns, gloves, swabs, razors, etc.

STANDARD REGULATORY REQUIREMENTS

Hazardous or contaminated materials may only be removed and disposed from the project site in accordance with the following provisions:

A. All work must be completed in accordance with the following regulations and requirements:

1. Chapter 6.5, Division 20, California Health and Safety Code.
2. California Administration Code, Title 22, relating to Handling, Storage, and Treatment of Hazardous Materials.
3. City of Sacramento Building Code and the Uniform Building Code, 1994 edition.

B. Coordination with the Sacramento County Environmental Management Department (SCEMD), Hazardous Materials Division is required, and all necessary applications shall be filed.

C. All hazardous materials must be disposed of at an approved disposal site and must only be hauled by a current California registered hazardous waste hauler using correct manifesting procedures and vehicles displaying a current Certificate of Compliance. The contractor must identify by name and address the site where toxic substances are to be disposed of. No payment for removal and disposal services must be made without a valid certificate from the approved disposal site that the material was delivered.

None of the aforementioned provisions are to be construed to relieve the contractor from the contractor's responsibility for the health and safety of all persons (including employees) and from the protection of property during the performance of the work. This requirement must be applied continuously and not be limited to normal working hours.

STANDARDS OF SIGNIFICANCE

For the purposes of this document, an impact is considered significant if the proposed project would:

- Expose people (e.g., residents, pedestrians, construction workers) to existing contaminated soil during construction activities;

- Expose people (e.g., residents, pedestrians, construction workers) to asbestos-containing materials; or

- Expose people (e.g., residents, pedestrians, construction workers) to existing contaminated groundwater during dewatering activities.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A AND C

As a medical facility, the project generates biohazards and minor amounts of toxic substances. Current procedure for disposal of medical waste includes: 1) sterilization of infectious and hazardous waste and incineration off-site; 2) radioactive waste is either held on-site to decay or transported to an appropriate facility; and 3) trash, including sterilized waste, is transported to the City of Sacramento's Kiefer Landfill. The Kaiser South Sacramento Medical Center is currently in compliance with all regulatory agency requirements for the handling of hazardous materials, such as the requirements of the State Department of Toxic Substance Control (DTSC), California Occupational Safety and Health Administration (CalOSHA), California Department of Transportation (Caltrans), Federal Occupational Safety and Health Administration (OSHA), National Institute of Health (NIH), and City of Sacramento Fire and Police Departments. Additional waste created by the proposed project would be disposed of using the same procedures currently established and would be covered by the current hazardous waste disposal permits.

Hazardous materials would be used in varying amounts during construction and occupancy of the proposed project. Products and materials typically used during construction that could contain hazardous substances include paints, solvents, cements, glues and fuels. Exposure of construction workers, employees or visitors to hazardous materials could occur in the following manner: improper handling or use of hazardous materials or hazardous waste during construction or occupancy of the proposed project; transportation accident; environmentally unsound disposal methods; or fire, explosion or other emergencies.

Construction workers and future visitors and employees could be exposed to hazards associated with accidental releases of hazardous materials that could result in adverse health effects. Hazardous materials that could be present during building occupancy include the products previously listed above, based on the nature of the proposed project. However, all allowable uses would be subject to code requirements, as necessary, which would ensure compliance with applicable permits and inspections.

Hazardous materials regulations, which are codified in Titles 8, 22, and 26 of the California Code of Regulations (CCR), and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code, were established at the state level to ensure compliance with federal regulations to reduce the risk to human health and the environment from the routine use of hazardous substances. These regulations must be implemented by employers/businesses, as appropriate, and are monitored by the state (e.g., Cal OSHA in the workplace or DTSC for hazardous waste) and/or local jurisdictions (e.g., the City of Sacramento Fire Department and SCEMD).

By ensuring that the medical facility would comply with the above regulations, the City would reduce impacts associated with the potential for accidental release of hazardous materials during occupancy of the proposed project that would result in increased risk of exposure to accidental release of hazardous materials, and the potential for an increased demand for incident emergency response. This would be accomplished by ensuring that regulated activities (health and emergency care, medical offices, etc.) are managed in accordance with applicable regulations such as Hazardous Materials Release Plans and Inventories, the California Accidental Release Prevention (CalARP) Program, and the California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements.

Compliance with Title 26, Division 6, of the CCR, which would be monitored by the City, would reduce impacts associated with potential for accidental release during construction or occupancy of the project site and the potential for an increased demand for incident emergency response. Compliance with this regulation would ensure that hospital facilities where hazardous materials are used or stored adhere to regulations designed to prevent leakage and spills of material in transit and provide detailed information to clean-up crews in the event of an accident.

Workplace regulations addressing the use, storage and disposal of hazardous materials in Title 8 of the CCR apply to medical care facilities, businesses and public facilities in and adjacent to the project site. Compliance with these regulations would be monitored by the City of Sacramento Fire Department and the SCEMD when they perform inspections for flammable and hazardous materials storage. Other mechanisms in place to enforce the Title 8 regulations include compliance audits and reporting to local and state agencies. Implementation of the workplace regulations would further reduce the potential for hazardous materials release.

Implementation of Title 49, Parts 171-180, of the Code of Federal Regulations would reduce any impacts associated with the potential for accidental release during construction or occupancy of the proposed project or by transporters delivering hazardous materials to the project site or picking up hazardous waste. These regulations establish standards by which hazardous materials are currently transported, within and adjacent to the project site. Where transport of these materials occurs on roads, the California Highway Patrol (CHP) is the responsible agency for enforcement of regulations.

Implementation of and compliance with applicable federal and state laws and regulations that are administered and enforced by the SCEMD, and City of Sacramento Fire Department standards (local agency that implements applicable hazardous materials-related sections of the Uniform Fire Code and Uniform Building Code) would ensure that impacts associated with the routine use, storage and transportation of hazardous materials in the proposed project would be less than significant.

QUESTION B

The proposed expansion of the medical center would not interfere with existing emergency evacuation plans. Impacts would be less than significant.

QUESTION D

Given that the project site is completely developed, it is unlikely that the proposed medical center expansion would involve the exposure of people to existing sources of potential health hazards. Impacts would be less than significant.

QUESTION E

The project site is currently developed with landscaping that poses minimal fire hazards. Furthermore, the site is not located in a high fire hazard area. Therefore, the proposed project would involve no risk of fire hazards, and no impact would result.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts regarding hazards.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
10. NOISE *Would the proposal result in:* A) Increases in existing noise levels? Short-term Long Term		 ✓ ✓	
B) Exposure of people to severe noise levels? Short-term Long Term		 ✓ ✓	

ENVIRONMENTAL SETTING

Noise is defined as unwanted sound. Sound levels are usually measured and expressed in decibels (dB) with 0 dB being the threshold of hearing. Decibel levels range from 0 to 140. Typical examples of decibel levels would be a low decibel level of 50 dB for light traffic to a high decibel level of 120 dB for a jet takeoff at 200 feet.

Several rating scales have been developed to analyze the adverse effect of noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the volume of noise, as well as the time of day when noise occurs. Those that are applicable to this analysis are as follows:

- L_{eq}, the Equivalent Noise Level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

- L_{dn}, the DayNight Average Level, is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime.

- CNEL, the Community Noise Equivalent Level, is similar to the L_{dn} and represents the average of 24 hourly readings of equivalent levels (L_{eq}) based on an A-weighted decibel and adjusted upward to account for increased noise sensitivity in the evening and at night. However, the CNEL includes an adjustment for the early evening (7:00 p.m. to 10:00 p.m.) as well as for the nighttime (10:00 p.m. to 7:00 a.m.).

Because the proposed project would involve helicopter activity, the following rating scale would also be appropriate:

- Sound Exposure Level (SEL), the total noise energy from a single noise event. The SEL is a metric used to describe the amount of noise a person is exposed to from individual aircraft flyover. It is computed from measured dBA sound levels. The SEL value is the integration of all the acoustic energy contained within the event.

The major freeway within the project vicinity is State Route 99. The rights-of-way within the project area are considered minor arterials. The project area is not affected by noise from railroad or airport operations. Noise sources such as residential, light industrial and roadway activity contribute to overall ambient noise levels in the project area. Noise sensitive receptors on the project site are hospital patients. Off the project site, the adjacent single- and multi-family residences, and childcare facility are also considered sensitive noise-receptors.

REGULATORY REQUIREMENTS

State

Title 24 of the CCR codifies Sound Transmission Control requirements, which establish uniform minimum noise insulation performance standards for new medical facilities. Specifically, Title 24 states that interior noise levels attributable to exterior sources shall not exceed 45 dBA CNEL in any room of a new medical facility. These design specifications are required so that the interior noise levels will meet this standard for at least ten years from the time of building permit application.

Local

City of Sacramento General Plan

The City's General Plan establishes maximum acceptable interior and exterior noise level criteria for development that may impact sensitive receptors, such as residential units, senior housing, child care facilities, etc. The General Plan specifies a maximum interior noise level of 45 dB L_{dn}, and a maximum noise level of 60 dB L_{dn} in common outdoor use areas associated with multi-family developments.

Sacramento Municipal Code

The Sacramento Municipal Code also contains regulations concerning noise. These noise regulations are found in Title 8 – Health and Safety, Chapter 8.68 (Noise Control). Section 8.68.060 exempts noise sources from certain construction activities such as excavation, demolition, alteration or repair of any building or structure between 7:00 a.m. and 6:00 p.m. Monday through Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday.

STANDARDS OF SIGNIFICANCE

Thresholds of significance are those established by the Title 24 standards and by the City's General Plan Noise Element and the City Noise Ordinance. Noise and vibration impacts resulting from the implementation of the proposed project would be considered significant if they cause any of the following results:

- Exterior noise levels at the proposed project which are above the upper value of the normally acceptable category for various land uses (SGPU DEIR AA-27) caused by noise level increases due to the project;
- Residential interior noise levels of 45 L_{dn} or greater caused by noise level increases due to the project;

- Construction noise levels not in compliance with the City of Sacramento Noise Ordinance;
- Occupied existing and project residential and commercial areas are exposed to vibration peak particle velocities greater than 0.5 inches per second due to project construction;
- Project residential and commercial areas are exposed to vibration peak particle velocities greater than 0.5 inches per second due to highway traffic and rail operations; and
- Historic buildings and archaeological sites are exposed to vibration peak particle velocities greater than 0.25 inches per second due to project construction, highway traffic, and rail operations.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A AND B

Short Term: Construction of the proposed project would generate short-term noise impacts. However, as described above, Section 8.68.080 of the Sacramento Municipal Code exempts noise sources from construction-related activitiesduring specified hours.

Although construction noise is exempt from the City's Noise Ordinance, the project site is a sensitive receptor, and mitigation measures would ensure that proper noise attenuation for potential severe noise levels is provided on-site and to adjacent sensitive receptors. Implementation of mitigation measures would reduce impacts to sensitive receptors to a less than significant level.

Long Term: As described above, under the Sacramento Municipal Code Section 8.68.080, any mechanical device, apparatus or equipment related to or connected with emergency activities or emergency work are exempt from the provisions of noise ordinance . Therefore, operational noise generated by the Emergency Department, such as ambulance traffic, would be exempt. The proposed project would increase traffic along surrounding roadways, thereby, potentially increasing noise levels within the area. However, RBF Consulting analyzed the potential noise impacts from the increased traffic and found that traffic would increase ambient noise by 0.3 dBA or less (refer to Appendix). This would be a less than significant impact. The project sponsor has construction standards for its facilities, such as dual-pane windows, that would reduce long-term noise impacts to patients from increased vehicular traffic. Other operational noise on the project site would be created by stationary sources, such as air conditioning equipment, and would potentially impact the adjacent residential structures. Mitigation measures to provide for proper noise attenuation would reduce this impact to a less than significant level.

The proposed Helipad would be constructed to the east of the new trauma center. Refer to Attachment 1, Site Plan. The Helipad would be used to receive emergency (medivac) flights only and would receive no more than six emergency helicopter flights per month. Three potential flight paths would be used for the helicopter flights: 1) south above State Route 99, over MOB 3, and then directly to the landing pad east of the trauma center; 2) north above State Route 99, over Bruceville Road and then to the landing pad; and 3) due east of the landing pad (straight over Parking Lot 8).

The Acoustics & Vibration Group prepared a noise study, dated December 8, 2004, to estimate the potential long-term noise impacts of the Helipad. The noise study examined existing noise levels on the project site and in the off-site sensitive receptor areas, and calculated the potential for noise increases due to helicopter flights. The off-site current average, L_{eq}, sound levels were measured at outdoor activity areas of the multi-family housing and playground of the nearby child care center and were approximately 49 to 55 dB(A). The existing on-site background sound levels at the hospital were measured at approximately 57 dB(A).

The Acoustics & Vibration Group assumed that helicopter events would typically last one to two minutes each and would be either flyovers or hovering maneuvers around the hospital. The City's Noise Element sets a goal for CNEL, or day-night average, L_{dn}, sound levels at school play areas and in residential outdoor activity areas of 65 dB or less for aircraft sound sources. Calculating a worst-case scenario of one day-time and one nightime helicopter flight, the projected on-site sound levels near the landing pad would increase to 66 dB(A) and off-site sound levels would increase to 55 to 58 dB(A) from the proposed Helipad. Although the City's Noise Element does not specify a goal for exterior hospital sound levels, the Kaiser Foundation has construction standards for its facilities, such as double-paned glass, which would reduce the long-term noise impacts to its patients from increased vehicular traffic and the helicopter events.

The impact from helicopter activity when viewed as individual events may differ from the daily average. There is a substantial amount of low frequency energy produced by helicopters that may be heard inside the nearby residences during nighttime hours. Though unlikely, sleep disturbance is possible from the SEL created by the helicopters as they pass near the surrounding neighborhood. The disturbance would be similar to a loud truck or motorcycle passing by on nearby Wyndham Drive, and depends on many factors including sensitivity of the individual to noise during sleep. Hospital rooms that are near the proposed Helipad, however, could experience high enough SEL values to cause sleep disturbances with some patients.

Operational impacts, including those from the proposed Helipad, would be reduced to less than significant levels with mitigation measures.

MITIGATION MEASURES

CONSTRUCTION MITIGATION MEASURES

1. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the Building Division.

2. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers, to the satisfaction of the Building Division.

3. During construction and to the satisfaction of the Building Division, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors during construction activities.

OPERATIONAL MITIGATION MEASURES

1. Electrical and mechanical equipment (i.e., ventilation and air conditioning units) shall be located as far away as is feasible from sensitive receptor areas. Additionally, the following shall be considered prior to installation: proper selection and sizing of equipment, installation of equipment with proper acoustical shielding, and incorporating the use of parapets into the building design.

2. Loading docks within the project area shall be designed to have either a depressed (i.e.,

below grade) loading dock area, an internal bay, or a wall to break the line of sight between noise sensitive uses and loading operations. During the final site design process, an acoustical consultant shall determine whether operation of the loading docks would result in noise levels that exceed City standards at exterior on-site or off-site sensitive uses. If it is determined that the design would not be sufficient, proper noise attenuation mitigation measures shall be incorporated into the plans to be submitted by the project sponsor to the City for review and approval, prior to the issuance of building permits.

3. Helicopter flight paths shall follow busy roadways to mask noise impacts with the road traffic noise. Low altitude flyovers shall be avoided, especially above residential property. The hospital shall ensure that patients that require sleep or are more sensitive to noise are located away from the side of the building facing the helicopter landing pad.

FINDINGS

With the incorporation of the above mitigation measures, noise impacts would be less than significant.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
11. PUBLIC SERVICES Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas: A) Fire protection?			✓
B) Police protection?			✓
C) Schools?			✓
D) Maintenance of public facilities, including roads?			✓
E) Other governmental services?			✓

Environmental Setting

Fire Protection. The City of Sacramento Fire Department provides fire protection services within the project area. The Fire Department operates approximately 21 stations. South Sacramento contains three fire stations located at Wyndham Drive, 66th Street and Fruitridge Road, and Florin-Perkins Road. Fire stations are located so as to provide a maximum effective service radius of two miles (SGPU DEIR, M-1). This service radius virtually assures blanket coverage of the City. Typical response time to fire calls is four minutes (SGPU DEIR, M-1).

Police Protection. Police protection is provided by the City of Sacramento Police Department.

Schools. There are six schools located within one mile of the project site. Las Flores High School and Rio Cazadero High School are located approximately 0.4 miles from the project site; Herman

Leimbach Elementary is located within 0.5 miles; Southpointe Christian School, Samuel Jackman School, and Prairie Elementary School are located less than one mile from the site. Sacramento City Unified School District and Elk Grove Unified School District serve the South Sacramento area.

Other Public Services. The City of Sacramento provides for other public services within the project area. The City of Sacramento is a member of the Underground Services Alert (USA) one-call program. Under this program, a contractor is required to notify the USA 48 hours in advance of performing excavation work. A developer has the responsibility for timely removal, relocation or protection of any existing utility services located on the site of any construction project.

STANDARDS OF SIGNIFICANCE

For the purposes of this report, an impact would be considered significant if the project resulted in the need for new or altered services related to fire protection, police protection, school facilities, roadway maintenance, or other governmental services.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A - E

The proposed project would include all features required by code, such as fire department equipment storage rooms, fire suppression systems, automatic sprinklers, smoke detection systems, and fire separation doors, to ensure occupant safety in the case of a fire. Emergency exits would be located on the south and west sides of the Outpatient Surgery Center, on the south and east sides of the Hospital Tower with connections to the exits in the existing hospital, and to the east side of the Emergency Department.

While the proposed project would increase the demand for fire protection services, because the project would include fire protection features required by the City, the proposed project would not create an inordinate demand for protection services such that new or altered facilities would be required. In addition, the proposed project would be required to pay all applicable City fees toward the provision of fire protection services to meet demands created by the project.

The project site would be served by the City of Sacramento Police Department (SPD). The addition of 115 hospital beds would not increase the demand for police services in the South Sacramento area. The proposed project would not require changes to patrols in the area, nor would it require the construction of a new station or expansion of an existing station.

The proposed project would also not result in effects to existing schools, nor the need for any new school facilities. Because the proposed project would be consistent with the land use designation of the General Plan and SSCP, the project would result in a less than significant impact to other governmental services.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to public services.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
12. UTILITIES *Would the proposal result in the need for new systems or supplies, or substantial alterations to the following utilities:* A) Communication systems?			✓
B) Local or regional water supplies?			✓
C) Local or regional water treatment or distribution facilities?			✓
D) Sewer or septic tanks?			✓
E) Storm water drainage?			✓
F) Solid waste disposal?			✓

ENVIRONMENTAL SETTING

Water Supply/Treatment. The City of Sacramento currently provides water service from a combination of surface and groundwater sources. The area south of the American River is served by surface water from the American and Sacramento Rivers. The City pumps groundwater to areas north of the American River. The City operates three diversion and treatment facilities: the Sacramento River, the American River, and the Riverside Water Treatments Plants; and four storage tanks, each with a three million gallon capacity (SGPU DEIR, H-1).

Sewer System. The City of Sacramento, including the project area, is serviced by the Sacramento Regional County Sanitation District 1 (CSD-1) (SGPU DEIR, I-1). The CSD-1 is responsible for the operation of all regional interceptors and wastewater treatment plants. The Regional Plant has an existing capacity of approximately 150 million gallons per day (mgd) of dry weather flow and 300 mgd of wet weather flow (SGPU DEIR, I-1). The plant discharges effluent subjected to secondary treatment into the Sacramento River downstream from City of Sacramento domestic water supplies.

Storm Water Drainage System. The project site currently has an on-site surface drainage system consisting of bioswales and storm drains that connect to the City's storm drain system. The project site is served by existing 8-inch stormwater pipes to the north and south of the site and 10-inch stormwater pipes to the west, which connect to a 54-inch main. The proposed project would continue to be served by the existing infrastructure, and would not require the construction of new or expanded facilities.[4]

Solid Waste. Solid Waste Removal Division within the Department of Public Works is responsible for collecting solid waste, sweeping the streets and abating litter (SSCP, p. 86). Commercial

[4] Wendy Haggard, Sacramento Regional County Sanitation District. Personal communication. August 24, 2005.

waste collection is performed by both City and permitted private haulers. Commercial solid waste is transported to the Sacramento Recycling and Transfer Station (8491 Fruitridge Road) and is then transported to Lockwood Landfill, near Sparks, Nevada. Commercial waste collected by private companies is disposed at a variety of facilities including the Sacramento County Keifer Landfill, the Yolo County Landfill, Forward Landfill, L and D Landfill, Florin Perkins Landfill and several privately run transfer stations.

STANDARD REGULATORY REQUIREMENTS

Federal

U.S. Environmental Protection Agency (EPA)

The EPA has established primary drinking water standards, which are contained in the Clean Water Act Section 304. States are required to ensure that potable water for the public meets these standards. In addition, standards for a total of eighty-one individual constituents have been established under the Safe Drinking Water Act, as amended in 1986. The EPA may add additional constituents in the future.

Resource Conservation and Recovery Act

Resource Conservation and Recovery Act (RCRA, Subtitle D) contains regulations for municipal solid waste landfills and requires states to implement their own permitting programs incorporating the federal landfill criteria. The federal regulations address the location, operation, design, groundwater monitoring, and closure of landfills.

State

Senate Bill 610 and 221

Senate Bill 610 (SB 610), enacted in 2001, is intended to ensure coordination during the land use planning process between water suppliers and local land use planning agencies (i.e., cities and counties) when considering certain large-scale development projects. SB 610 achieves this through two mechanisms that link water supply availability and development approvals. First, it made changes to the requirements for urban water suppliers to prepare an Urban Water Management Plan (UWMP) that contains detailed information regarding their supplies. Second, it obligated cities and counties to request a Water Supply Assessment (WSA) from all potential suppliers of water for any large-scale project, such as residential developments over 500 units, commercial/office with over 1,000 employees or 250,000 square feet, hotels with over 500 rooms, or any project that would demand water equivalent to, or greater than, 500 dwelling units. Once a WSA has been prepared, the water supplier is required to prepare a Written Verification of water supply adequacy for inclusion in the administrative record for the project, as requirement of SB 221. The proposed project would not increase demand for water greater or equivalent to 500 dwelling units; therefore, a WSA and Written Verification are not required for this project.

Urban Water Management Planning Act

The Urban Water Management Planning Act (Act) and SB 610 are interrelated; the UWMP is typically relied upon to meet the requirements of SB 610. The Act was developed due to concerns for potential water supply shortages throughout the State of California. The Act requires information on water supply reliability and water use efficiency measures. Urban water suppliers are required by the Act to develop and implement UWMPs to describe their efforts to promote efficient use and management of water resources. Sacramento's UWMP is discussed below. The UWMP provides a general overview of water resources and infrastructure within a jurisdiction and is updated every five years.

California Safe Drinking Water Act

Enacted in 1976, the California Safe Drinking Water Act is codified in Title 22 of the CCR. Potable water supply is managed through local agencies and water districts, the State Department of Water Resources (DWR), the Department of Health Services (DHS), the State Water Resources Control Board (SWRCB), the CalEPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights or requesting irrigation water from state or federal distribution facilities. For a large part of California, potable water is managed by the DWR through the State Water Project (SWP), a water storage and delivery system of reservoirs, aqueducts, powerplants, and pumping plants. The City of Sacramento, however, relies on local agencies and water districts for safe potable water.

Water Conservation Projects Act

California's requirements for water conservation are codified in the Water Conservation Projects Act of 1985. The purpose of this act is to encourage local agencies and private enterprise to implement water conservation and reclamation projects.

Water Recycling Act

Enacted in 1991, the Water Recycling Act (WRA) established water recycling as a priority in California. The WRA encourages municipal wastewater treatment districts to implement recycling programs to reduce local water demands. The Sacramento Municipal Code has measures in place to implement the mandates of the WRA.

Assembly Bill 939

In 1989, the California Legislature passed Assembly Bill (AB) 939 requiring California cities to implement plans designed to reduce waste deposited in landfills by 50 percent per person by December 31, 2000. As part of AB 939, cities and counties were required to develop a Source Reduction and Recycling Element (SRRE).

Local

Water Forum Agreement

The Water Forum Agreement (WFA) established the guiding principles for water management in the Sacramento area and adjacent foothill region. The collaborative effort took place over six years and represents business, agricultural, environmental, citizen, water management, and local government interests in Sacramento County, and water interests in Placer County and western El Dorado County. The agreement proposes the American River, the Sacramento River and groundwater as sources of future water supply. Water diversions from the American River would occur upstream of Folsom Reservoir, from Folsom Reservoir proper, from Nimbus Reservoir, and from the Lower American River. The agreement provides a comprehensive package of linked actions that will achieve the two co-equal objectives of providing a reliable and safe water supply for the region's economic health and planned development to the year 2030 and preserving the fishery, wildlife, recreational, and aesthetic values of the Lower American River.

Urban Water Management Plan

The City has developed an UWMP in accordance with the state's Urban Water Management Act (see discussion above). The UWMP describes water demand and supply within the City, evaluates methods related to the conservation of water, presents an urban water shortage contingency plan, and provides information on the availability of reclaimed water and its potential for use as a water source in the City. With the expanded facilities, water supply would be reliably provided to all areas of the City under buildout conditions. Growth of the City's water supply system is intended to primarily meet the City's needs within its service area, and also facilitate regional programs to conjunctively manage surface and groundwater supplies as part of the ongoing WFA implementation project. As noted above, the UWMP is also a tool used to prepare WSAs for eligible projects.

Sacramento Regional County Solid Waste Authority (SWA)

Ordinance 8 was established to regulate the transport, transfer, disposal and recycling of commercial solid waste kept or accumulated within the SWA region. The ordinance was put into place for the purposes of ensuring the orderly operation of solid waste transport and disposal, and also to minimize adverse effects on human health and the local environment.

Sacramento Municipal Code

Chapter 17.72 of the City of Sacramento Municipal Code outlines the recycling and solid waste disposal regulations. These regulations are necessary in order to lengthen the lifespan of landfills, encourage recycling, and meet state mandated goals for waste reduction and recycling, specifically AB 939. These policies provide guidelines regarding the location, size and design features of recycling and trash enclosures in a manner by which adequate, convenient space for the collection, storage and loading of recyclable and solid waste material is provided. In addition, developers are required to submit a "statement of recycling information" to the City's solid waste manager. The requirement for this statement includes: a site plan which includes design specifications, plans for demolition and construction, and any details of proposed education/public relations programs.

Source Reduction Recycling Element

The California Integrated Waste Management Act of 1989 (AB 939, as described above) mandates that each city prepare, adopt and submit a SRRE. AB 939 required all cities to achieve a minimum diversion of 25 percent of the City's waste stream from landfilling by the year 1995 and 50 percent diversion by the year 2000. The City of Sacramento's Final Draft SRRE, approved in 1995, pledges to exceed the requirements of AB 939, where feasible, in an effort to achieve a 70 percent landfill avoidance goal adopted by City Council in August 1989. In order to achieve this goal, the City has implemented a number of programs, including curbside recycling, drop-off and buy-back centers and compost programs.

STANDARDS OF SIGNIFICANCE

For purposes of this environmental document, an impact is considered significant if the proposed project would:

- Result in a detriment to microwave, radar, or radio transmissions;
- Create an increase in water demand of more than ten million gallons per day;

- Substantially degrade water quality;
- Generate more than 500 tons of solid waste per year; or
- Generate stormwater that would exceed the capacity of the stormwater system.

ANSWERS TO CHECKLIST QUESTIONS

QUESTION A

The project would not result in the need for new communications systems.

QUESTIONS B AND C

According to the Department of Utilities, the project would not result in significant impacts to existing local or regional water supply facilities, or the need for any new major local or regional water treatment facilities.[5] The City has enough water to supply the site; therefore, water line connections at the project site would not affect existing water system capacity. However, the project may not have sufficient pressure for water to reach the top floors of the proposed Hospital tower, and an on-site fire pumper may be required. Prior to issuance of building permits, the City would require that the project demonstrate sufficient pressure to all floors. Therefore, the proposed project's impact on water supply and treatment would be less than significant.

QUESTION D

CSD-1 estimates that the proposed project would generate an average sewage flow of 0.2 mgd, which is half of the design capacity for the site.[6] Thus, there would be sufficient sewer capacity for the proposed project. The project would not result in the need for new sewer systems or supplies, or substantial alterations to existing sewer system, and less than significant impacts would result.

QUESTION E

The project site is completely developed, predominately covered by impervious surface, and has bioswales and an on-site surface drainage system that connect to the City's storm drain system by means of a storm drain service tap. The City has also completed a new detention basin to the north of the site that is sufficient to receive drainage from the site. Because the proposed project would pave more than one acre, the Department of Utilities would require on-site treatment in a detention system, such as a swale or underground vault. As described in Section 4.C, the project proposes an underground detention system that would meet the City's stormwater detention requirements. Therefore, the proposed project's impact on storm water drainage would be less than significant.

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[5] Inthira Southiyanon. City of Sacramento Department of Utilities, Water Services. Personal communication. August 24, 2005.
[6] Wendy Haggard. Sacramento Regional County Sanitation District. Personal communication. August 24, 2005.

QUESTION F

The project would comply with the City's requirements for solid waste recycling and would, therefore, reduce the demands on the City's landfills, resulting in a less than significant impact on solid waste disposal.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to utilities.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
13. AESTHETICS, LIGHT AND GLARE Would the proposal: A) Affect a scenic vista or adopted view corridor?			✓
B) Have a demonstrable negative aesthetic effect?			✓
C) Create light or glare?			✓
D) Create shadows on adjacent property?			✓

ENVIRONMENTAL SETTING

The visual and aesthetic environment surrounding the project site is characterized by typical views of streets and freeway, and residential and commercial uses. There are no unique or visually outstanding natural or manmade features within the project area. The project site has appropriate lighting for a large medical facility, including 24-hour lighting around the Emergency Department. The General Plan designates scenic corridors, which include the American and Sacramento Rivers, and the Capitol Mall. The project site is not located in a protected scenic corridor.

STANDARDS OF SIGNIFICANCE

Shadows. New shadows from developments are generally considered to be significant if they would shade a recognized public gathering place (e.g., park) or place residences/child care centers in complete shade.

Glare. Glare is considered to be significant if it would be cast in such a way as to cause public hazard or annoyance for a sustained period of time.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A - D

The project site and surrounding area are not within a scenic vista or adopted view corridor. Under the proposed project, some surface parking lots would be replaced with new structures and landscaping, which would be compatible with the existing visual character of the project site.

The tallest proposed structure would be the five-story Hospital Tower at 80 feet in height. The addition would be located on the southerly side of the existing hospital and would be setback approximately 160 feet from Wyndham Drive. The proposed architectural design would integrate the Hospital Tower with the existing four-story hospital and would include cement plaster walls in light gray, dark gray and brick colors, a metal panel system in charcoal, metal frame windows and brick accents. The architecture of the Hospital Tower as well as the Outpatient Surgery Center and other proposed additions would provide a handsome design and would improve the overall visual character of the medical center campus.

In addition, a five-story parking structure approximately 53 feet in height is proposed on the northeasterly portion of the site (in the current location of Parking Lot 3). The parking structure would be setback approximately 50 feet from Bruceville Road and has a parking structure appearance. Architectural enhancements, such as using textured paint to match the existing campus, and landscaping would help soften the appearance of the proposed structure; however, the parking structure would not necessarily result in a demonstrable negative aesthetic effect.

Proposed lighting would be consistent with the requirements of the Sacramento City Code and would include cut-off luminaries to reduce potential skyglow and glare impacts. All mechanical equipment would be screened from off-site view.

The Hospital Tower would be inherently low glare because it would have a cement plaster exterior with small punched openings. The Outpatient Surgery Center would have a concrete facade with a textured finish similar in appearance to the cement plaster. All full height windows would be located on the first floor, which would minimize glare to the adjacent properties and vehicular traffic, pedestrians and other passers-by. The full height windows would include horizontal shading devices to further reduce glare. Windows on the upper floors would be approximately 6 feet in height and 5 to 6 feet in length, number between seven and seventeen per floor per side, and spaced up to 24 feet in between. All windows would be glazed and held in aluminum frames, and they would produce no significant glare.

Based on the discussion above, the project would not affect a scenic vista or adopted view corridor, have a demonstrable negative aesthetic effect, create light or glare, or create shadows on adjacent properties. Therefore, impacts would be less than significant.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to aesthetics, light or glare.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
14. CULTURAL RESOURCES *Would the proposal:* A) Disturb paleontological resources?			✓
B) Disturb archaeological resources?		✓	
C) Affect historical resources?			✓
D) Have the potential to cause a physical change which would affect unique ethnic cultural values?			✓
E) Restrict existing religious or sacred uses within the potential impact area?			✓

ENVIRONMENTAL SETTING

The project site is not within a Primary Impact Area for cultural resources as identified in the General Plan (SGPU DEIR, pg V-5). The North Central Information Center prepared a records search of the project site on October 19, 2005, and concluded that there is a low potential for finding prehistoric or historic archaeological sites during project implementation (refer to Appendix).

STANDARDS OF SIGNIFICANCE

Cultural resource impacts may be considered significant if the proposed project would result in one or more of the following:

- Cause a substantial change in the significance of a historical or archaeological resource as defined in CEQA Guidelines Section 15064.5; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A - E

The project site is not located in a Primary Impact Area for cultural, historical, or paleontological resources. However, the possibility remains that important cultural resources could be uncovered and impacted during the construction of sub-grade components. The following mitigation measures would ensure that impacts to cultural resources would be less than significant.

MITIGATION MEASURES

1. If subsurface archaeological or historical remains are discovered during construction, work in the area shall stop immediately and a qualified archaeologist and a representative of the Native American Heritage Commission shall be consulted to develop, if necessary, further mitigation measures to reduce any archaeological impact to a less than significant level before construction continues.

2. If human burials are encountered, all work in the area shall stop immediately and the Sacramento County Coroner's office shall be notified. If the remains are determined to be Native American in origin, both the Native American Heritage Commission and any identified descendants shall be notified and recommendations for treatment solicited (CEQA Section 15064.5; Health and Safety Code Section 7050.5; Public Resources Code Section 5097.94 and 5097.98).

FINDINGS

With the incorporation of the above mitigation measures, the project would have a less than significant impact on cultural resources.

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
15. <u>RECREATION</u> *Would the proposal:* A) Increase the demand for neighborhood or regional parks or other recreational facilities?			✓
B) Affect existing recreational opportunities?			✓

ENVIRONMENTAL SETTING

The project site has been designated in the General Plan for urban land uses. Two neighborhood parks are located within a mile of the project site (Valley Hi Community Park and Wood Park). Also, a bicycle trail, Jacinto Creek Parkway, is located within 1.2 miles. Valley Hi Road and Wyndham Drive have existing Class II, on-street bike lanes.

ANSWERS TO CHECKLIST QUESTIONS

QUESTIONS A AND B

The proposed project would not result in increased demand for neighborhood or regional parks nor affect existing recreational opportunities because it would not increase the number of residents in the City or region. Therefore, impacts would be less than significant.

MITIGATION MEASURES

No mitigation measures are required.

FINDINGS

The proposed project would result in less than significant impacts to recreation.

MANDATORY FINDINGS OF SIGNIFICANCE

Issues:	Potentially Significant Impact	Potentially Significant Impact Unless Mitigated	Less-than-significant Impact
16. MANDATORY FINDINGS OF SIGNIFICANCE A. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	✓		
B. Does the project have the potential to achieve short-term, to the disadvantage of long-term environmental goals?			✓
C. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)			✓
D. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? Disturb paleontological resources?		✓	

ANSWERS TO CHECKLIST QUESTIONS

QUESTION A

The proposed project would not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, or threaten to eliminate a plant or animal community. The project would not impact rare or endangered wildlife species, or eliminate important examples of the major periods of California history or prehistory. However, the project may result in potentially significant air quality and transportation/circulation impacts, which will be studied in the EIR to be prepared for the project.

QUESTIONS B & C

The project would not contribute to any cumulative impacts since the project is consistent with 1986 South Sacramento Community Plan and the City of Sacramento General Plan Update, and would not create additional impacts over and above those previously evaluated and overridden.

QUESTION D

With implementation of the mitigation measures described in this document, the project would not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.

SECTION IV - ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would potentially be affected by this project.

	Land Use and Planning		Hazards
	Population and Housing		Noise
	Geological		Public Services
	Water		Utilities and Service Systems
✓	Air Quality		Aesthetics
✓	Transportation/Circulation		Cultural Resources
	Biological Resources		Recreation
	Energy and Mineral Resources	✓	Mandatory Findings of Significance
	None Identified		

SECTION V - DETERMINATION

On the basis of the initial evaluation:

I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because the project-specific mitigation measures described in Section III have been added to the project. A NEGATIVE DECLARATION will be prepared.

✓ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

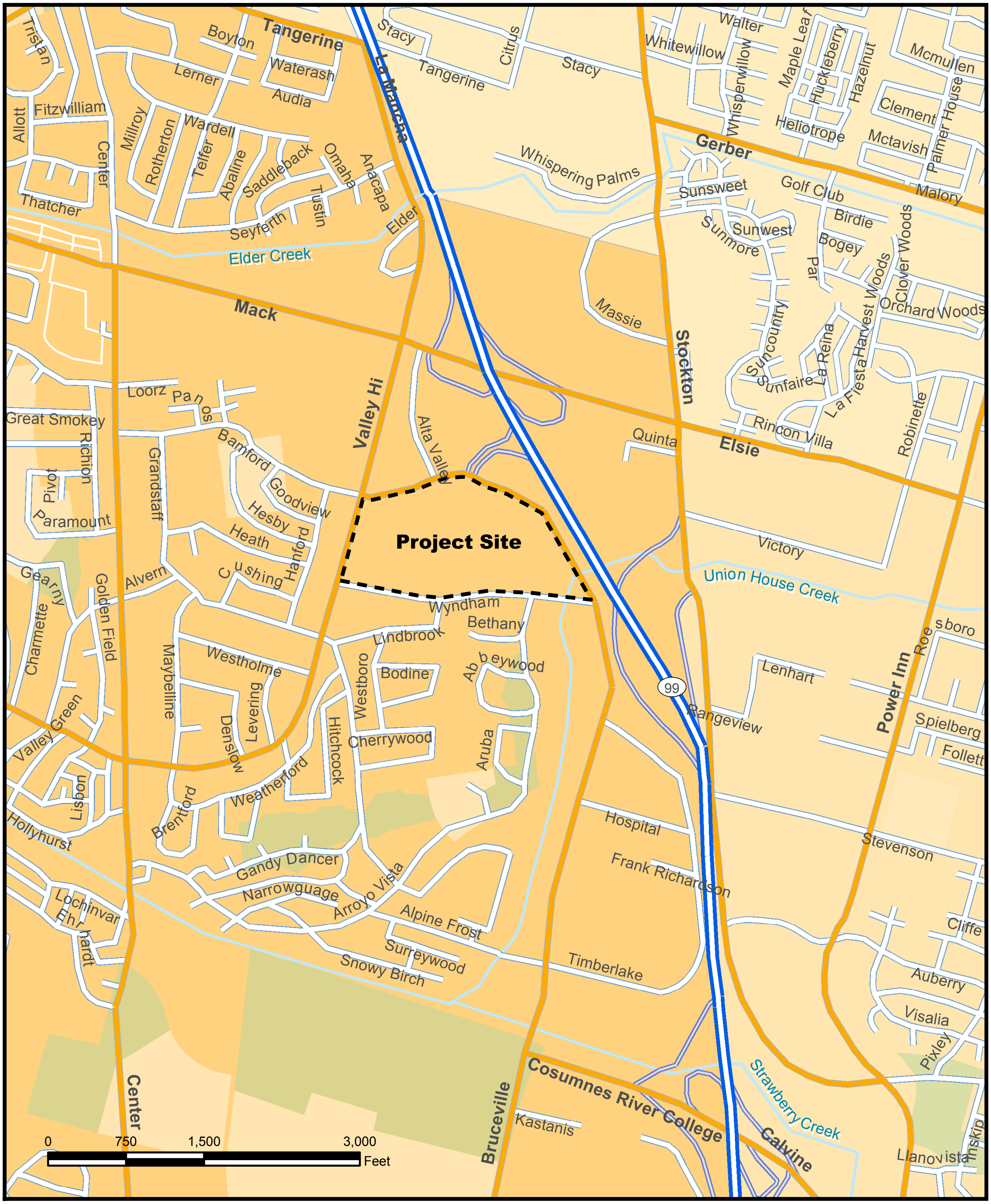
Signature

Date

Dana Allen, Senior Planner

Printed Name

ATTACHMENTS



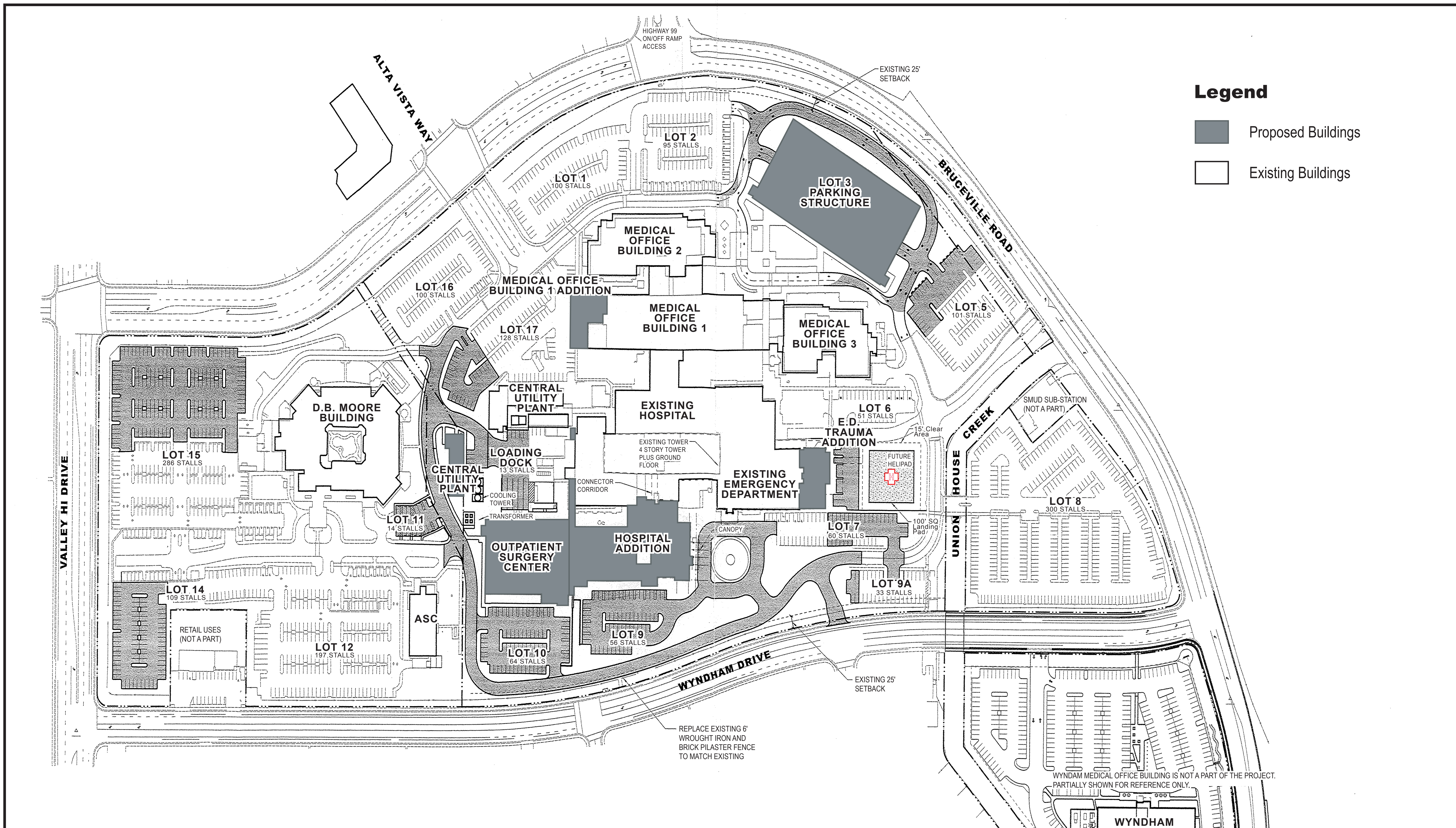
N

8/18/05 JN 35-100490

KAISER SOUTH SACRAMENTO MEDICAL CENTER EXPANSION

Vicinity Map

Attachment 1



Source: Lionakis Beaumont Design Group Inc. (2005)

RBF CONSULTING

0 180 320 Feet
APPROXIMATE

8/17/05 JN 35-100462

KAISER SOUTH SACRAMENTO MEDICAL CENTER EXPANSION

Proposed Site Plan

Attachment 2

APPENDICES

The Acoustics & Vibration Group
5700 Broadway Sacramento, CA 95820-1852
916-457-1444 FAX 916-457-1475
Consultants in Acoustics, Vibration & Noise Control

NOISE IMPACT STUDY OF PROPOSED EMERGENCY HELICOPTER ADDITION TO KAISER SOUTH SACRAMENTO FACILITY COMPARED TO NOISE LIMITS

Prepared for

Kaiser South Sacramento Medical Center
c/o Capital Projects at Valley Point
6600 Bruceville Road.
Sacramento, CA 95823

Prepared by

Brian R. Smith
BRIAN R. SMITH, SENIOR ENGINEER

Approved by

Steve Pettyjohn
STEVE PETTYJOHN, PRINCIPAL
CERTIFIED: INSTITUTE OF NOISE CONTROL ENGINEERS-1981

December 8, 2004

R04186

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1.0 SUMMARY

This report documents the potential noise impact of the addition of emergency helicopter services to the Kaiser facility in the south area of Sacramento. Traffic on Highway 99, Bruceville Road and Wyndham Drive is the major sound source affecting the project site and surrounding areas today. Secondary sources include aircraft overflights and general human activity. The addition of a trauma center with emergency helicopter services will add a new source to the existing acoustic environment.

Kaiser South-Sacramento is an existing hospital facility west of Highway 99. Bruceville Road borders the north and east of the site, Wyndham Drive lies along the south property line, and Valley High Drive is along the west of the site. Residential property exists to the south of the Kaiser facility along with a child care center directly south of the proposed helicopter landing pad. The hospital is trying to add a new trauma center to expand its facilities. An emergency helicopter service is proposed as part of the trauma center. It is anticipated that at most, 5 or 6 helicopter flights would take place at the hospital per month.

Transportation noise sources, including aircraft, fall under the requirements of the City's Noise Element [1]*. The Noise Element sets a goal for Community Noise Equivalent Level, CNEL, or day-night average, L_{dn}, sound levels at school play areas and in residential outdoor activity areas of 65 dB or less for aircraft sound sources. Existing average, L_{eq}, sound levels measured at the outdoor activity areas of the multi-family housing and the playground of the child care center were approximately 49 to 55 dB(A). These same partial hour intervals increased in average to 55 to 58 dB(A) with the addition of a helicopter flyover. The helicopter flyover events typically lasted one to two minutes each and were either flyovers or hovering maneuvers around the hospital. While the average sound levels were dominated by these short duration events, the CNEL impact is much lower. Assuming a worst case scenario of one helicopter event per day and one at night in a given 24 hour period, the CNEL due to the helicopters would be 45 to 51 dB(A) at the properties south of Kaiser. This is much less than the Noise Element requirement for outdoor activity areas of 65 dB(A), and thus is not significant.

At the hospital site, existing background sound levels were about 57 dB(A). Using the same assumptions as the previous CNEL calculation, the CNEL near the landing pad due to the helicopters is 66 dB(A). The Noise Element does not set a requirement for the exterior of a hospital, and therefore, the impact is not significant.

The impact from the addition of emergency helicopter activity to the trauma center when viewed as individual events may differ from the daily average. There is a substantial amount of low frequency energy produced by helicopters that may be heard inside the nearby residences during nighttime hours. Though unlikely, sleep disturbance is possible from the sound exposure level, SEL, created by the helicopters as they pass near the surrounding neighborhood. The disturbance would be similar to a loud truck or motorcycle passing by on the nearby Wyndham Drive, and depends on many factors including the sensitivity of the individual to noise during sleep. Hospital rooms that are near the proposed landing pad, however, could see high enough SEL values to cause sleep disturbances with some patients.

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* - *Number(s) in brackets refer to references listed at the end of this report*

While the impacts of helicopter flyovers relative to the City's Noise Element will be insignificant, measures can be used to reduce any other potential impacts. Helicopter flight paths should follow busy roadways as much as possible. Low altitude flights should be avoided, especially over residences. The hospital can try to minimize the impact to its patients by placing noise sensitive patients in rooms away from the landing pad.

2.0 ACOUSTIC STANDARDS

Sounds generated by a project or impacts to a project fall under the jurisdiction of two sets of City of Sacramento acoustical criteria. The first criterion is given in the City's Noise Element [1]. A second standard is contained in the Noise Ordinance [2]. The various City sound limits are explained below.

2.1 Noise Element Standards

Acoustic criteria contained in the Noise Element are based primarily on the day-night average, L_{dn}, sound level. The Noise Element addresses the average sound level over 24-hours and is directed mainly at transportation sources. An acoustical study is needed when noise-sensitive land uses, such as a residence, will be subjected to day-night average sound levels greater than 60 dB. The day-night noise descriptor averages measured or predicted sound levels over 24-hours after applying a 10 dB penalty to nighttime sounds. Hourly average, L_{eq}, sound levels are measured or predicted for each hour of the day or for each hour during which a sound source is present. A 10 dB penalty is added to each hourly average sound level measured or predicted from 10:00 p.m. to 7:00 a.m. The penalty is applied because people trying to sleep during these hours are more sensitive to external sounds. For aircraft sound, the Noise Element uses the Community Noise Equivalent Level, CNEL, descriptor. The CNEL is the same as the L_{dn} except it adds a 5 dB penalty added to each our between 7:00 p.m. and 10:00 p.m. It is possible to exclude or include only certain sources. If no events happen during the nighttime, no penalty would be applied. When some sources are excluded from the analysis, it is called the Background L_{dn} sound level.

In the Noise Element [1], exterior L_{dn} or CNEL noise levels up to 60 dB are "Normally Acceptable" for residential property and schools. For L_{dn} or CNEL sound levels of 60 to 70 dB, land use compatibility for a residence or school would be classified "Conditionally Acceptable". An exterior L_{dn} or CNEL sound level of 70 to 75 dB is classified "Normally Unacceptable". Table 1 of the Noise Element of the General Plan requires the exterior CNEL sound level to be less than or equal to 65 dB in the outdoor activity areas of schools or residences for aircraft sound sources. Helicopter flyovers could be considered an aircraft transportation noise source and thus be evaluated using the requirements of the Noise Element, although the emergency helicopters are a short-duration sound source because of the low number of expected flyovers.

2.2 City Noise Control Ordinance

The second criteria, the Noise Ordinance [2], looks at the sound produced during shorter times by sources not related to transportation equipment. The one exception is that sound produced by transportation equipment while on private property may be regulated by the Noise Ordinance. This Ordinance limits the amplitude and duration of sound produced over any given 1-hour period. Sound limits are based on the type of source, the duration of the sound, the time of day of occurrence, background sound levels and the tonal content of sound. It is a City code and is enforceable with limited exceptions. Mechanical equipment used for air-conditioning is allowed to make a maximum of 55 dB(A) over the full 24-hours. The Noise Ordinance applies a 5 dB penalty to the limits set when the sound is comprised mainly of speech or music or if it contains pure tones or impact sounds. When background sound levels equal the limits given in Table I for the individual categories, the limit of that category is raised in 5 dB increments to encompass the background sound level with one exception. The maximum background sound level is the exception to this rule. If the maximum background sound level exceeds the limit given in Table II, the measured values become the new limit. Table I summarizes limits of the Noise Ordinance with and without a penalty but without regard to the background. The limits in Table I do not apply to the emergency helicopter flyovers since they are considered a transportation sound source. However, because the number of events is low as is the duration of the events, the values in this table may give a better indication of the response of people to such events.

TABLE I. Noise Ordinance Limits for the City of Sacramento for Residential Property Affected by Non-Transportation Sources.

		Exterior Sound Level Limits, dB(A)			
		Without Penalty☞		With Penalty☞	
Category	Cumulative Number of Minutes in any 1-hour period	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
1	30 (L_{50})	55	50	50	45
2	15 (L_{25})	60	55	55	50
3	5 ($L_{8.3}$)	65	60	60	55
4	1 ($L_{1.7}$)	70	65	65	60
5	0 (L_{MAX})	75	70	70	65

☞ - Penalty applies when sound is composed primarily of speech or music, contains pure tones or results from impacts or impulsive sources.

3.0 SITE & PROJECT DESCRIPTION

Kaiser Permanente has a hospital in the southern region of the City of Sacramento. The Kaiser facility is bordered by Wyndham Drive to the south, Valley High Drive to the west, and Bruceville Road to the north and east. The hospital is considering adding a new trauma center to the Sacramento facility and this would include a helicopter landing pad. The trauma center and corresponding landing pad are proposed near the southeast corner of the Kaiser South site.

Residential property exists south of the project site. Several multi-family apartment buildings lie on the south side of Wyndham Drive. The community pool and activity area for these multi-family residences is on the north side of the property, close to Wyndham Drive. A child care facility is also on the south side of Wyndham, almost directly south of the proposed landing pad. The play ground for the child care center is on the south side of the building. The parking lot for the child care center is in front of, i.e., north of the building or along the street on the west side. Single family home lie south of the child care center facing west with their backyards on the east side. Kaiser's new Medical Office Building 3, MOB 3, sits directly east of the child care center and the first few single family homes. Other surrounding property is a mix of commercial and residential.

Three potential flight paths are planned for the proposed trauma center emergency helicopter flights. One path comes from the south up US 99, entering the hospital site over MOB 3 then directly to the landing site west of the hospital emergency center. The helicopter would then depart to the north over hospital property, continuing over to US 99 and on to the north. The second path is the reverse of the first with the helicopter approaching from the north then entering over Bruceville Road and into the landing zone. The departure would be over MOB 3 to US 99 then south. The final path enters directly from the east and departs the same way. Typically, the helicopter flies over the landing site and drops quickly to the ground. Similarly, when leaving, the rotary wing craft lifts off the ground, departing quickly from the area.

4.0 TEST EQUIPMENT AND PROCEDURES

Standard sound measuring equipment was used during the tests. Field sound measurements were made using two CEL 593 (s/n 3/0201692 and s/n 2/0881414) Sound Analyzers, two CEL 480 (s/n 129858 and s/n 2/112179) Sound Level Meters, and one Larson-Davis LD700 (s/n 1455), and one Larson-Davis LD720 (s/n 294) Sound Level Meter. The four CEL meters and the LD700 sound meter (s/n 1455) employ ½ inch random incidence condenser microphones. A CEL Type 284/2 calibrator was used to calibrate these meters and the microphones to 114 dB at 1000 Hz before beginning measurements. These meters conform to the requirements of a Type I meter per American National Standards Institute [3]. The LD720, s/n 294, is a Type II meter per the ANSI standard. A 3/8 inch piezoelectric microphone was installed on this meter and was calibrated to 114 dB(A) at 1000 Hz at the start of the test with a Larson Davis CA150 calibrator. A windscreen covered each microphone during all sound measurements. These meters can measure statistical sound levels such as the L_{10}, the sound level exceeded 10 percent of the time, the L_{50}, the sound level exceeded 50 percent of the time, the L_{90}, the sound level exceeded 90 percent of the time, and the average sound level, L_{eq}. Sound level meters also capture the maximum sound level, L_{MAX}. The CEL 593 meters were used to collect representative sound level tones in one-third octave bands.

Field sound measurements were made on October 6, 2004 between 10:45 a.m. and 11:45 a.m. at the Kaiser facility and surrounding property. Average sound levels, L_{eq}, were measured to use as a basis for predicting the future L_{dn} sound levels. Other statistical descriptors of the sound, labeled L_x, and the maximum sound level, L_{MAX}, were measured also. Here, L_x represents values such as the L_{50} or L_{25}. These sound descriptors give additional information about how sound varied over the test period. That is it can tell you whether it was a source that was near the site for only a short time or a source that continued over substantial time.

Measurements were made at one position at the Kaiser facility near the proposed landing pad and at three positions in the neighborhood to the south with microphones mounted on tripods 5.5 to 6 feet above ground level. For all positions, sound levels were measured during consecutive one minute or five minute intervals to identify sources and variations in sound with time. Continuous measurements were made at all positions. A summary description of each test position follows:

a. Position #1: Kaiser Sacramento parking lot, approximately 40 feet southwest of the proposed landing site.
b. Position #2: Child care center south of Kaiser facility on Wyndham Drive, southeast corner of play yard.
c. Position #3: East apartment complex south of Kaiser facility on Wyndham Drive, south of pool area.
d. Position #4: West apartment complex southwest of Kaiser facility on Wyndham Drive, southeast corner of pool area, approximately 45 feet south of north fence.

Helicopter flyovers were conducted during the sound tests to measure the potential impact of emergency helicopter activity on the surrounding areas. Three flyovers from varying paths were arranged by Flight Safety Institute. The helicopter flew over the hospital and test sites during the approach to the first flight path that began to the south of the hospital, proceeding north along US 99 to the hospital. Sound measurements were made over intervals with and without the flyovers to compare background sound with sound from the helicopter flights.

5.0 SOUND SOURCES

5.1 Existing

Traffic on US 99 and Bruceville Road was the major sound source affecting most of the measurement positions. As the distance from US 99 increased, the influence of the traffic noise from this highway on the acoustical environment decreased. Traffic on Wyndham Drive was also a major sound source at the residential measurement locations, although the source was not continuous because of the light traffic on this roadway. Other sources of sound include yard maintenance activities, aircraft flyovers, and general human activity.

5.2 Existing Plus Project

Road traffic on US 99 and Bruceville Road will continue to dominate the daytime and nighttime acoustic environment at the residences south of the Kaiser hospital. Other sources such as yard maintenance equipment, vehicle traffic on other local streets, and aircraft over flights will remain secondary in importance. Proposed emergency helicopter flyovers related to the hospital will add to the acoustic environment.

Based on conversations with Flight Safety Institute, it is anticipated that the Kaiser South trauma center would have at most 5 to 6 round trip operations per month for emergency services with about two-thirds of the flights during daytime hours and one-third of the flights at night. For calculation of the CNEL, it was assumed that for a worst case scenario there would be one flight between 7:00 a.m. and 7:00 p.m. and one flight between 10:00 p.m. and 7:00 a.m. during a given 24 hours.

6.0 EXTERIOR ACOUSTIC ENVIRONMENT

6.1 Existing

Field sound measurements were used to evaluate the existing acoustic environment. Averages of the 5-minute or 1-minute test samples were computed for the test period. Averages of the short interval sound levels and other statistical descriptors are given in Table II. The averages were computed both with and without the helicopter flyover events that occurred during testing. Passes 2 through 4 were part of the official flight safety pattern while Pass 1 occurred because the helicopter was trying to get to the beginning of the first flight path and to become familiar with the landing site and how it was marked. For each flight, the helicopter flew along the designated path, then hovered about 100 feet above ground for about 15 seconds before departing. Hovering is not standard but doing a full landing was not possible. Greater engine power is required than for landing, but not as great as the initial lift off from the ground. However, the higher sound levels during lift off occur near ground level where ground effects typically reduce the sound levels propagated over any distance such as to the three off test positions. Thus, these tests should represent the worse case scenario for number of events, duration of the event, and condition or position of the helicopter for an extended time.

TABLE II. Sound Levels Measured at Four Positions at and Near Kaiser South Facility in Sacramento With and Without Influence of Helicopter Flyovers.

		Measured Sound Level, dB(A)							Notes
Position	Time of Day	L_{eq}	L_{MAX}	$L_{1.7}$	$L_{8.3}$	L_{25}	L_{50}	L_{90}	
1	10:55-11:30	75	95		72	61	59	57	Heli Pass 2, 3, 4
2	10:45-11:40	61	77		65	57	53	49	Heli Pass 2, 3, 4
	10:45-11:40	59	77		62	58	53	50	Heli Pass 2 & 3
	10:45-11:40	58	77		61	57	53	50	Heli Pass 2
	10:45-11:40	55	69		58	55	53	50	No Helicopters
3	10:45-10:50	57	64	62	60	58	56	53	Yard Equip
	11:05-11:36	57	72	68	62	53	50	48	Heli Pass 2, 3, 4
	11:05-11:35	55	72	64	57	51	49	48	Heli Pass 2 Only
	11:15-11:35	49	60	53	51	50	49	48	No Helicopter
4	10:45-11:00	55	67	62	58	56	53	49	Yard Equip
	11:01-11:26	59	73	68	64	59	54	48	Heli 1, 2, 3, 4
	10:45-11:26	58	73	66	62	58	54	48	Heli 1, 2, 3, 4
	10:45-11:26	56	72	65	60	56	53	48	Heli Pass 1 & 2
	10:45-11:26	54	68	62	58	55	52	48	No Helicopter

Both background sound levels, i.e., sound levels corresponding to existing conditions, and the sound level with the addition of emergency helicopter flights are given in Table I. Background L_{eq} sound levels ranged from 49 dB(A) at Position #3 to 55 dB(A) at Position #2. Road traffic and local events are the major sound sources at all three positions. Traffic on US 99 is more important at Position #2 because of its proximity to the road and because of shielding by the daycare center building of traffic on Wyndham Drive. The L_{90} sound levels ranged between 48 to 50 dB(A) with L_{50} sound levels varying at the three sites between 49 and 53 dB(A). Position #2 had the highest L_{50} sound levels because of US 99, though Position #4 had similar levels because of local traffic and activity.

The limited data in Table II was used to predict current day-night average sound levels at the three sites, excluding sound from landscape maintenance or other transient events that do not occur on a daily basis. An L_{dn} sound level of 57 dB is predicted for the backyard of the daycare center, Position #2. For Position #3, an L_{dn} of 51 dB is predicted while an L_{dn} of 56 dB is predicted for Position #4.

6.2 Existing Plus Project

Roadway traffic is expected to remain the dominant sound source for existing plus project conditions. A new secondary source will be the added emergency helicopter flyovers. A decision to add the new trauma center has not been made nor a schedule made for when it might be introduced if a positive decision is reached. For purposes of this analysis, since background sound levels will likely increase over time, existing background sound level conditions were assumed as a worst case.

Table I shows that the highest sound levels were measured at Position #1, near the land/hovering site at Kaiser South as expected. Figure 1 presents the variation in statistical sound levels over time, clearly showing the three main helicopter events and background sound levels. Measurements at all four positions lasted less than an hour. Since three to four helicopter events occurred during this interval even though a maximum of one event is predicted during either the day or the night, these tests represent the worse case sound conditions, even when extrapolated to an hour. The values in Table II were computed for all helicopter events and with some events left out as if the test lasted one hour. This means that background sound levels were used to extrapolate to what would happen over the full hour. As an example, Figure 2 displays the statistical sound levels measured at Position #2 before, during and after the three main helicopter flights. Some landscape maintenance activity influenced the results before the helicopter flights began, but were not a factor after the flights. The data from 11:17 to 11:38 was used to represent normal "quiet" background sound events.

The average, L_{eq}, sound level was 61 dB(A) at Position #2 over the test interval when considering all three flight safety events. If only the 2nd and 3rd passes are considered, the average decreased by 1 dB(A) with another 1 dB(A) reduction if only the first flight is included in the average. With no helicopters, the L_{eq} sound level dropped to 55 dB(A), 3 dB(A) less than for the single flight condition and 6 dB(A) less than when all three helicopter flights are included in the average. This difference would be noticeable. Even with these four assumptions about helicopter activity, i.e., 0, 1, 2 or 3 flights per hour, the sound level exceeded 50 percent of the time, the L_{50} sound level, saw no change in value. This means that if the flights were evaluated against the City's Noise Ordinance, the flights would not exceed the limits for the L_{50} sound level. The 60 dB limit for the L_{25} sound level would not have been exceeded at the child daycare center either. The $L_{8.3}$ sound level limit of 65 dB would not have been exceeded under any of the three flight assumptions, but with three flights in an hour, the measured value was at the limit. The meter used at this position does not retain the $L_{1.7}$ sound level, the level exceeded 1 minute in an hour, but does give the result for the complete test. For the assumption of three flights in an hour, the test shows that the 70 dB(A) limit of the City Noise Control Ordinance would have been exceeded. For either one or two helicopter flights, the predicted $L_{1.7}$ sound level would be less than the 70 dB(A) limit. The City's limit of 75 dB(A) was exceeded at Position #2, but only during the flight from the south, Pass 2, that passed near the test site when approaching the landing pad. Pass 3 that departed to the south did not reach 75 dB(A) even though the flight should have been the reverse of the approach from the south. During the pass coming from the east and returning to the east, the L_{MAX} sound level was slightly above 75 dB(A) as seen in Figure 2. Thus, on an hourly basis, the helicopter flights do not create a basis with regards to transportation sound limits. However, when judged as a non-transportation sound source, the maximum sound level of this transient event would be distinct compared with other background sound sources.

Figure 3 shows the sound levels measured at Position #3 near the swimming pool at the apartment complex closest to the landing site. Landscape maintenance work was being done at the start of the test. The influence of the helicopters compared with the background sound levels is seen in this figure. With all three helicopter passes included, the L_{eq} sound level was 57 dB(A). The L_{eq} sound level dropped to 55 dB(A) for only one pass while the background was 49 dB(A). This difference in the average sound level would easily be detected. The L_{50} sound level was nearly the same with and without helicopter events and less than the City's daytime limit. The L_{25} sound level dropped 3 dB(A) between three helicopter flights and the background but only 1 dB(A) between one pass and the background. The 3 dB(A) difference for three passes would easily be detected but the L_{25} sound level for either three or one pass does not exceed the City's limit given in Table I. A 2 dB(A) difference exists between the background $L_{8.3}$ sound level and the level with one helicopter round trip event. The difference increases to 4 dB(A) with three complete helicopter trips. The measured levels all meet the City's limits for non-transportation sound sources, but the events would be detected. The background $L_{1.7}$ sound level was 53 dB(A) but this increased to 64 dB(A) for one helicopter pass and to 68 dB(A) with three passes. This is a very large change that would be quite noticeable. However, the measured values for either one or three events are still less than the City's daytime limit of 70 dB(A). The maximum, L_{MAX}, sound level from 60 dB(A) for the background without landscape activities to 72 dB(A) for the helicopter. These maximum sound levels would be easily perceived as differing from the background.

Sound level variations measured at Position #4 are presented in Figure 4 for 5-minute intervals. The longer measurement intervals smooth out the data, making the influence of the helicopter flights less distinct. Table II shows that the background L_{eq} sound level was 54 dB(A), increasing to 56 dB(A) for two helicopter passes and 58 dB for four passes. Evaluating the influence of only a single flyover was not possible with the data as measured. An increase of only 1 dB(A) is predicted for a single round trip. The difference between the background L_{eq} sound levels and the L_{eq} sound levels for three passes would be noticeable to an observer. Little or no difference is seen between either the background L_{90} or the L_{50} sound levels and these values when measured with either one or two helicopter trips. Thus, for most of the time, these events do not have an influence on the background sound level observed during at least 30 minutes in an hour. The levels are less than the City's limit for non-transportation sound sources. The L_{25} sound level increased only 1 dB(A) for two events but 3 dB(A) when four helicopter events were included. For one or two events in an hour, the change in sound would be detected only because of a difference in the tonal content. The City's L_{25} sound level limit for non-transportation sound sources was not exceeded. An increase of 2 dB(A) in the $L_{8.3}$ sound level from background to two helicopter events is seen in Table II. For four trips, the $L_{8.3}$ sound level increased by 4 dB(A) over background values. These differences probably would be noticed, especially for the larger increase. All $L_{8.3}$ sound levels are in compliance with the City's non-transportation sound limits. The background $L_{1.7}$ sound level increased 3 dB(A) when including two helicopter trips and additional

1 dB(A) when considering all four trips. These differences would be detected by a normal listener. However, the $L_{1.7}$ sound levels meet the requirements of the city of Sacramento for non-transportation sound sources. The maximum background sound level was sound 68 dB(A) while the L_{MAX} sound level was 72 for two helicopter trips and 73 when considering all events. This difference in maximum probably would have been detected. The values are all less than the daytime limit of the City's Noise Control Ordinance.

A comparison of the average sound levels measured in 5-second intervals is displayed in Figure 5. Only 20-minutes of testing are shown in this figure, but it clearly shows the influence of the helicopter flights and the background sources. The amplitude of sound decreased as the distance from the proposed landing pad increased. As a result, the hospital will be impacted the most, followed by the child care facility, east apartment complex, and, finally, the west apartment complex. A frequency spectrum of the helicopter flyovers compared to background spectrums is displayed in Figure 6. As shown in the figure, a low frequency pure tone exists around 25 Hz. Pure tones increase the "annoyance" of sound and is why the City's Noise Control Ordinance for non-transportation sound sources incorporates a 5 dB penalty for sounds containing pure tones.

Sound measured for the various helicopter passes was used to calculate existing plus project CNEL average sound levels. The direction and proximity of the helicopter flyovers relative to each measurement position resulted in different sound levels for every pass. A worst case mix of the sound levels for the four flyovers during testing was used to approximate the total sound exposure level, SEL, to which each position was exposed. The SEL for each helicopter flyover is used to compute the CNEL sound level. For a given 24 hours, the assumption was that there was one round trip flight during the day and another at night. Table III presents the predicted CNEL sound levels for the helicopters at each position.

TABLE III. Predicted CNEL Sound Levels Based on Sound Exposure Levels for Existing Plus Project Conditions at Each Position for the Proposed Emergency Helicopter Services at Kaiser South, City of Sacramento.

Description	Position #1	Position #2	Position #3	Position #4
Leq, dB	84	69	65	65
SEL, dB	105	90	85	83
Duration, Seconds	125	120	95	65
CNEL	66	51	46	45

The CNEL levels for Positions 2 thru 4, properties south of Kaiser, are well below the City's typical requirement for outdoor activity areas of residential properties and schools of 65 dB. The City does not set a requirement in the Noise Element for exterior levels at a hospital. Therefore, 66 dB CNEL is allowed. Since the proposed helicopter flyovers are so infrequent, CNEL is not the best descriptor to use to learn impacts. Instead, one should look at what impact the helicopter flyover has over a typical hourly sound level.

6.3 Cumulative Plus Project

Road traffic volumes would be expected to increase over time. This will be true of local roads as well as on US 99. Traffic at the hospital will increase as it serves a larger population. Vehicle volumes will grow on US 99, Bruceville Road, and Wyndham Drive as the region is further developed. This will result in an increase in background sound levels of approximately 1 to 3 dB within the next 20 years. Sound generated by emergency helicopter flights will remain the same or possibly decrease as sound reduction is implemented for the helicopters. Increasing background sound levels will reduce the difference between the background sound levels and the sound generated by helicopters. This will results in less distinction between the two except that caused by differences in the tonal content. The results for existing plus project conditions represent the worse case scenario.

7.0 INTERIOR ACOUSTIC ENVIRONMENT

The State of California assumes that a 15 dB reduction can be expected from the exterior to the interior of a building with the windows open. Thus, any CNEL or L_{dn} sound level greater than 60 dB will cause interior sound levels to be greater than the 45 dB interior limit [1] if the windows or doors are allowed to be open. From the exterior CNEL levels in Table III, interior levels will be acceptable per the Noise Element at the multi-family housing south of Kaiser. The existing Kaiser hospital building will be exposed to CNEL levels above 60 dB, therefore interior levels in hospital rooms will exceed 45 dB with the windows open. Assuming the windows are closed and typical building construction was utilized for the hospital, the interior sound levels in hospital rooms should be less than 45 dB, even with an exterior CNEL level of 66 dB.

Helicopter generated sound may still be heard in interior spaces either at the hospital or in the surrounding neighborhood. Short duration exterior sound levels at the apartments south of Kaiser were above 65 dB for the helicopter flyovers. At the hospital, short duration sound levels exceeded 70 dB with an L_{MAX} at 95 dB. In addition, the substantial amount of low frequency energy associated with helicopters will penetrate building structures easier than typical traffic sounds.

8.0 NOISE IMPACTS

8.1 Exterior

Using the CNEL sound level descriptor from the City's Noise Element to predict the impact of helicopter flyovers, it is apparent that the residential property south of Kaiser (Positions #2 through #4) will not have a significant impact. Exterior CNEL levels are predicted to be above 65 dB at the hospital assuming worst case conditions and would fall under the "Conditionally Acceptable" section of the land use compatibility chart for hospitals.

The impact of individual helicopter events is insignificant relative to the limits of the City's Noise Control Ordinance. Because of the difference in sound amplitude and tonal content, the helicopter flights will easily be detected by those living near the south side of the hospital.

8.2 Interior

Interior L_{dn} or CNEL sound level impacts will be insignificant at the residences and childcare center to the south of Kaiser from the addition of the emergency helicopter activity. Sleep disturbances are still possible, however, from the short duration helicopter flyovers. The difficulty in determining whether or not an event will disturb a person's sleep depends on a large number of factors including an individual's sensitivity to noise, background sound levels, tonal content of sound, SEL, and the definition of a sleep disturbance. The impact is expected to be similar to a loud motorcycle or truck passing by on Wyndham Drive. Reducing the impact is possible, but is limited to the path of the helicopter and the distance of the flight path to the nearest resident.

Interior impacts relative to the CNEL or L_{dn} descriptors are expected to be insignificant in the hospital rooms facing the proposed landing pad. However, these hospital rooms will be subjected to short duration, high intensity sound levels that could potentially disturb sleep. It is much more likely that a hospital patient will be disturbed by the helicopter activity than a nearby resident because of the higher SEL levels near the hospital and the fact that the patient is not sleeping in their typical residence.

9.0 MITIGATION MEASURES

Completely eliminating the impact of sound generated by the helicopter flyovers is not possible. Some measures can be implemented, however, to reduce the impact. Flight paths should follow above busy roadways to try to mask some helicopter sound with the noise from the road traffic. Low altitude flyovers in general should be avoided, especially above residential property. There is no control over what time a day an emergency will occur, and therefore, limiting hours of operation is not possible. The hospital should also try to keep patients that require sleep or are more sensitive to noise away from the facade of the building that faces the helicopter landing pad.

10.0 REFERENCES

1. Sacramento City Planning Commission, "Noise Element" from Chapter 8, "Health and Safety Element" from the *City of Sacramento General Plan Updated*, Adopted January 19, 1988.

2. Noise Control Ordinance of the City of Sacramento, Ordinance No. 3872, approved by the City Council, May 31, 1977 and as revised. See Sacramento City Code, Chapter 66.

3. American National Standards Institute, ANSI, ***Standard Specification for Sound Level Meters, S1.4-1983 (Precision)***

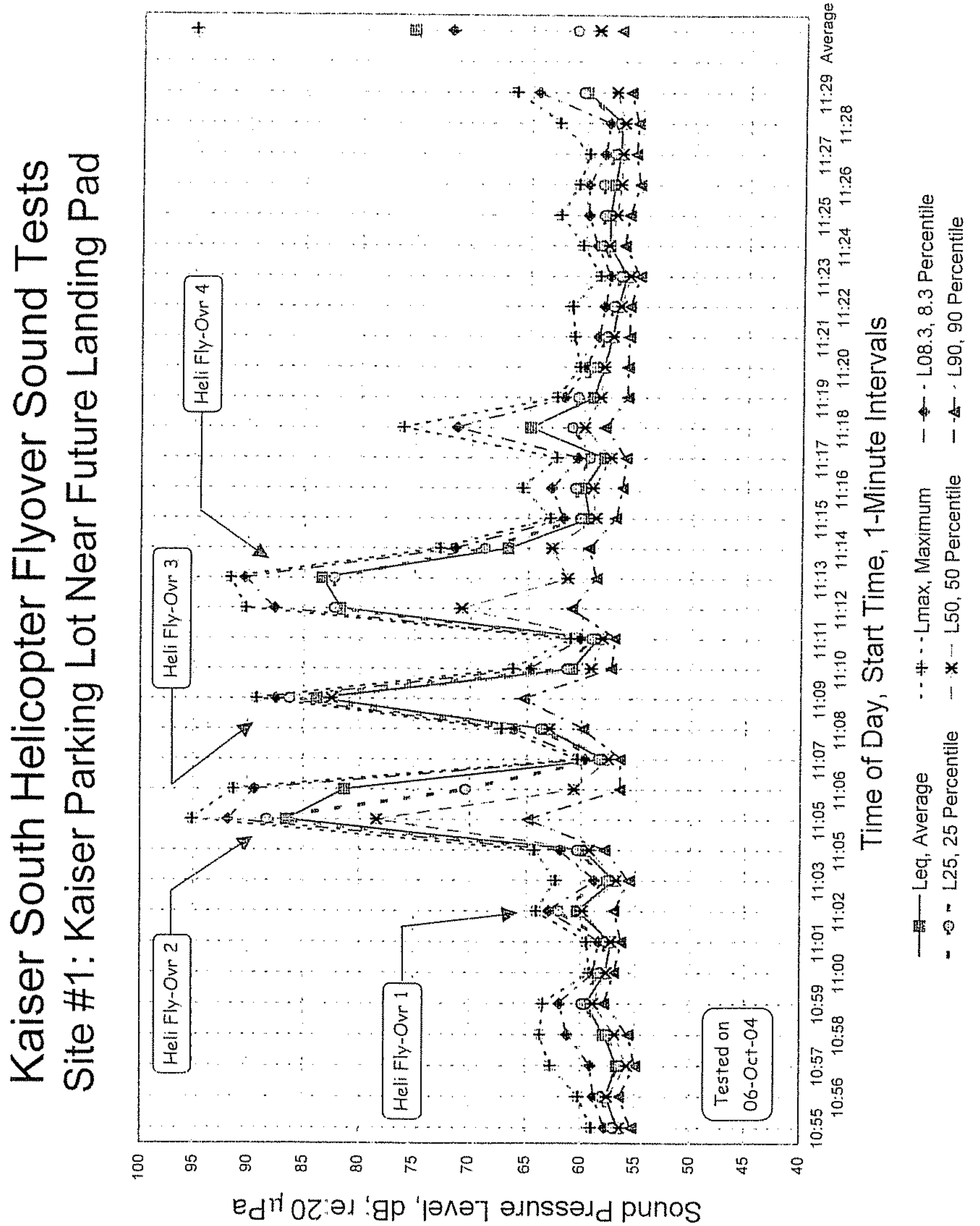

Figure 1. Sound Level Variations Measured in 1-min Intervals at Position 1, Near Proposed Landing Pad at Kaiser.

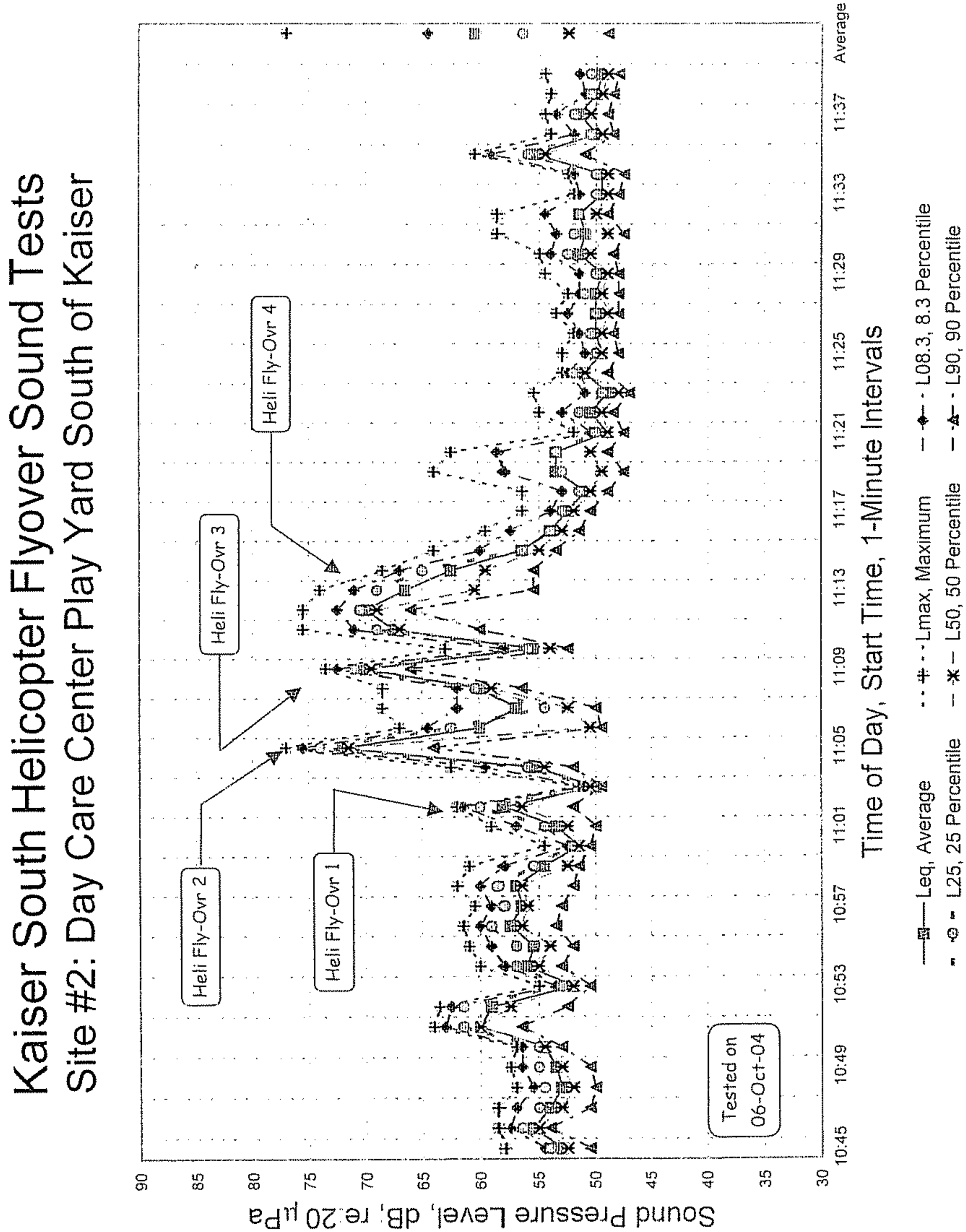

Figure 2 Variation in Statistical Descriptors of Sound at Position #2, Playground of Child Care Facility South of Kaiser

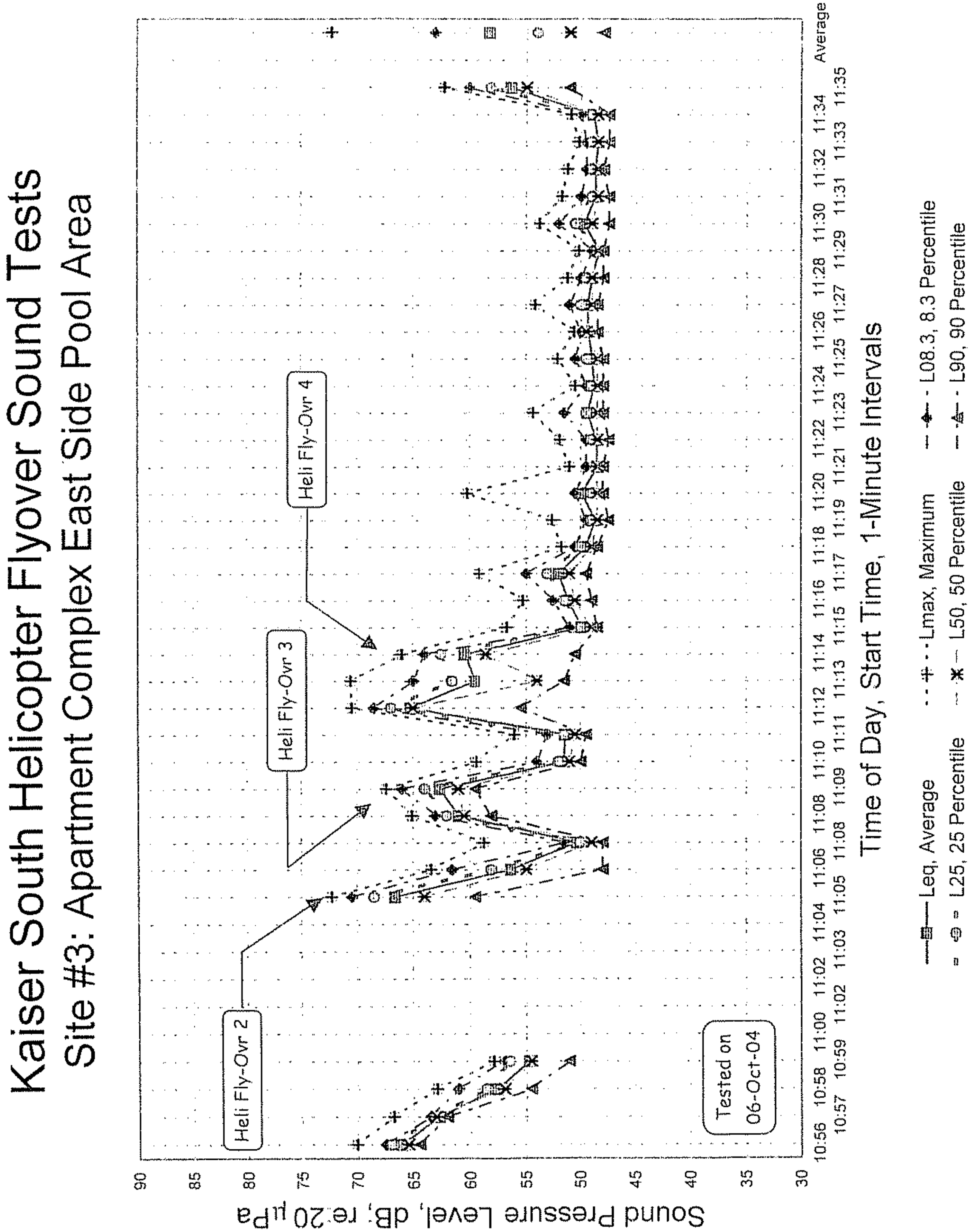

Figure 3. Sound Level Variations Measured in 1-min Intervals at Position #3, Eastern Apartment Complex Pool Area.

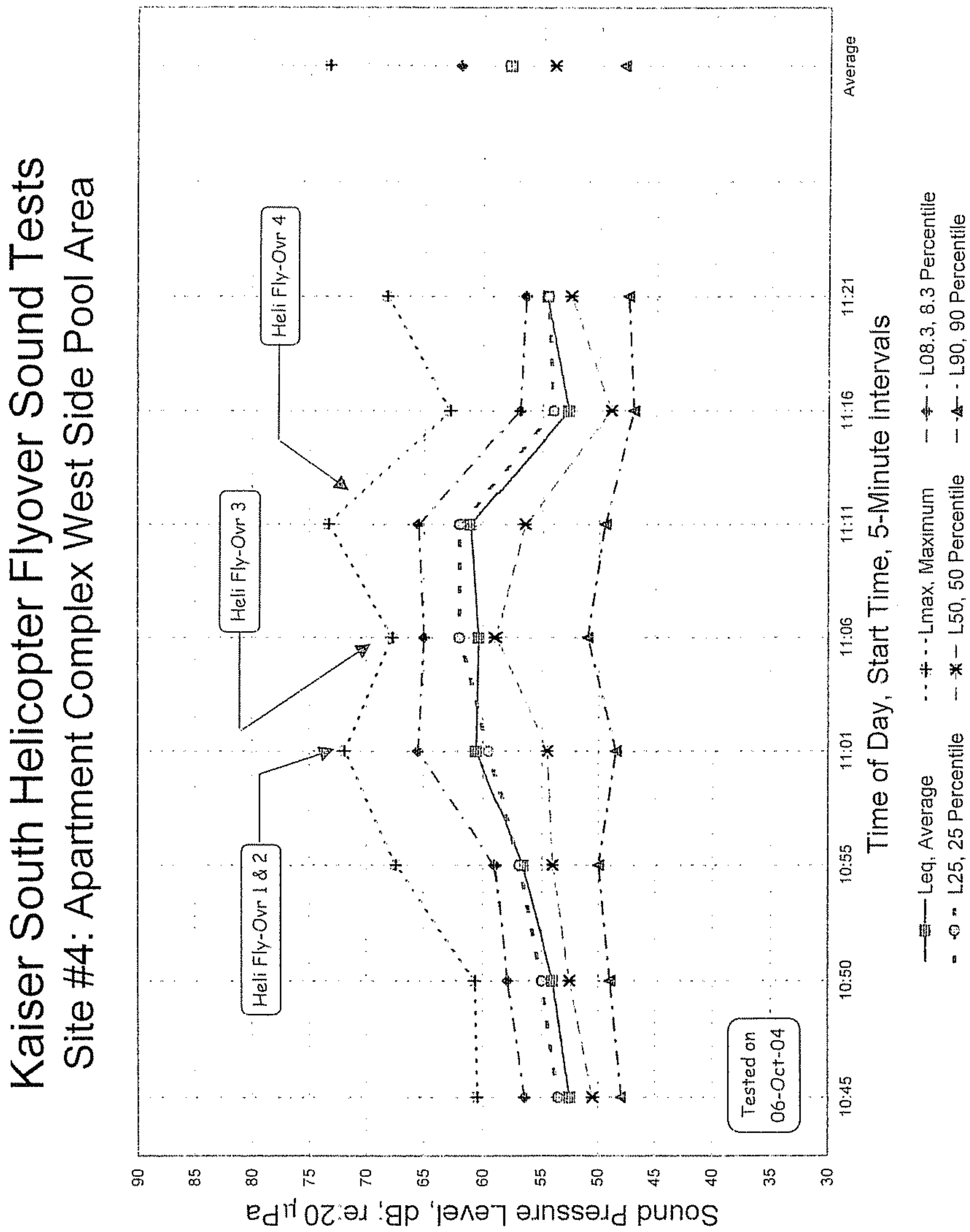

Figure 4 Variation in Statistical Descriptors of Sound at Position #4, West Apartment Complex Pool Area

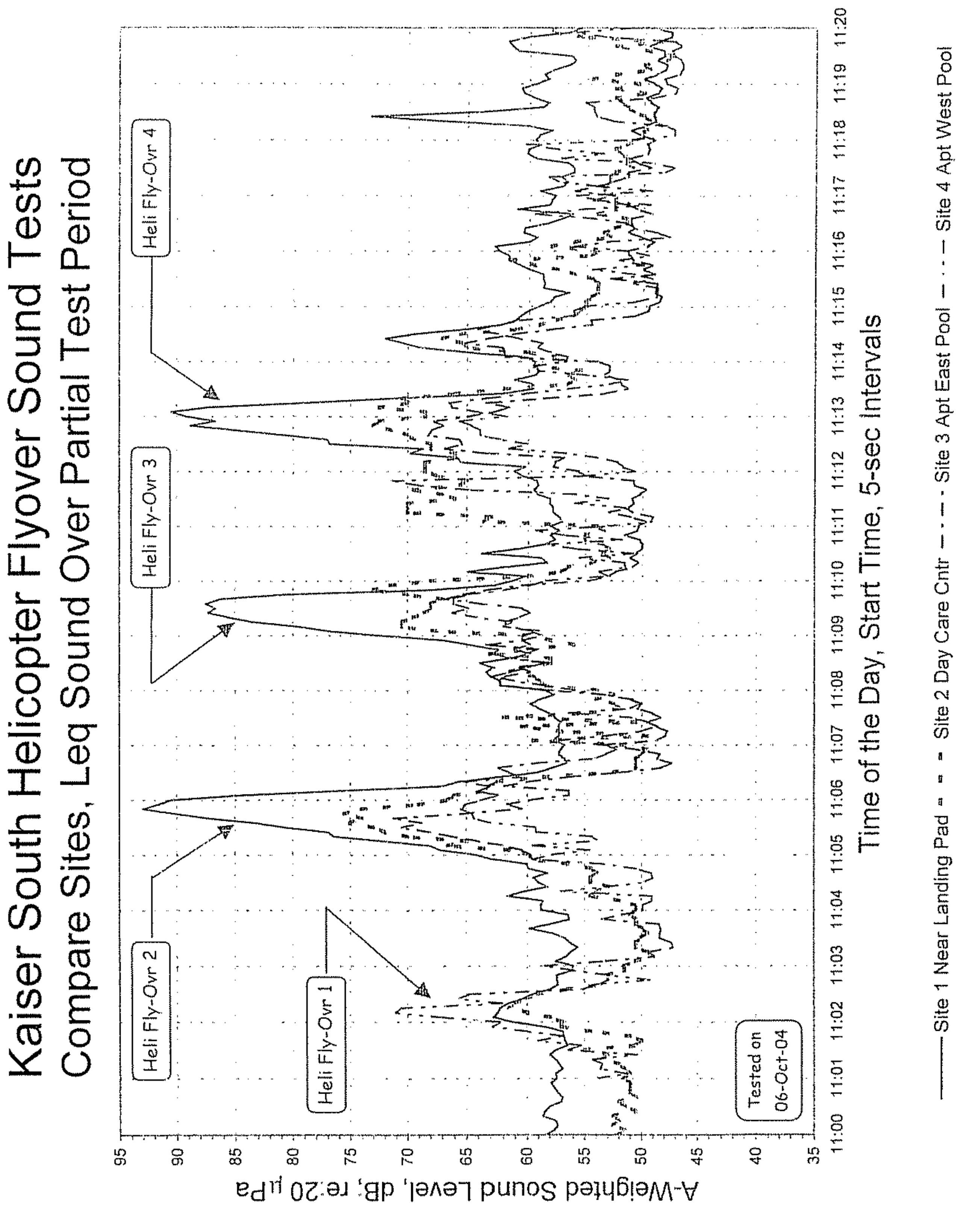

Figure 5 Results of Continuous Measurements in 5-Second Intervals at All Four Positions for Kaiser Helicopter Tests

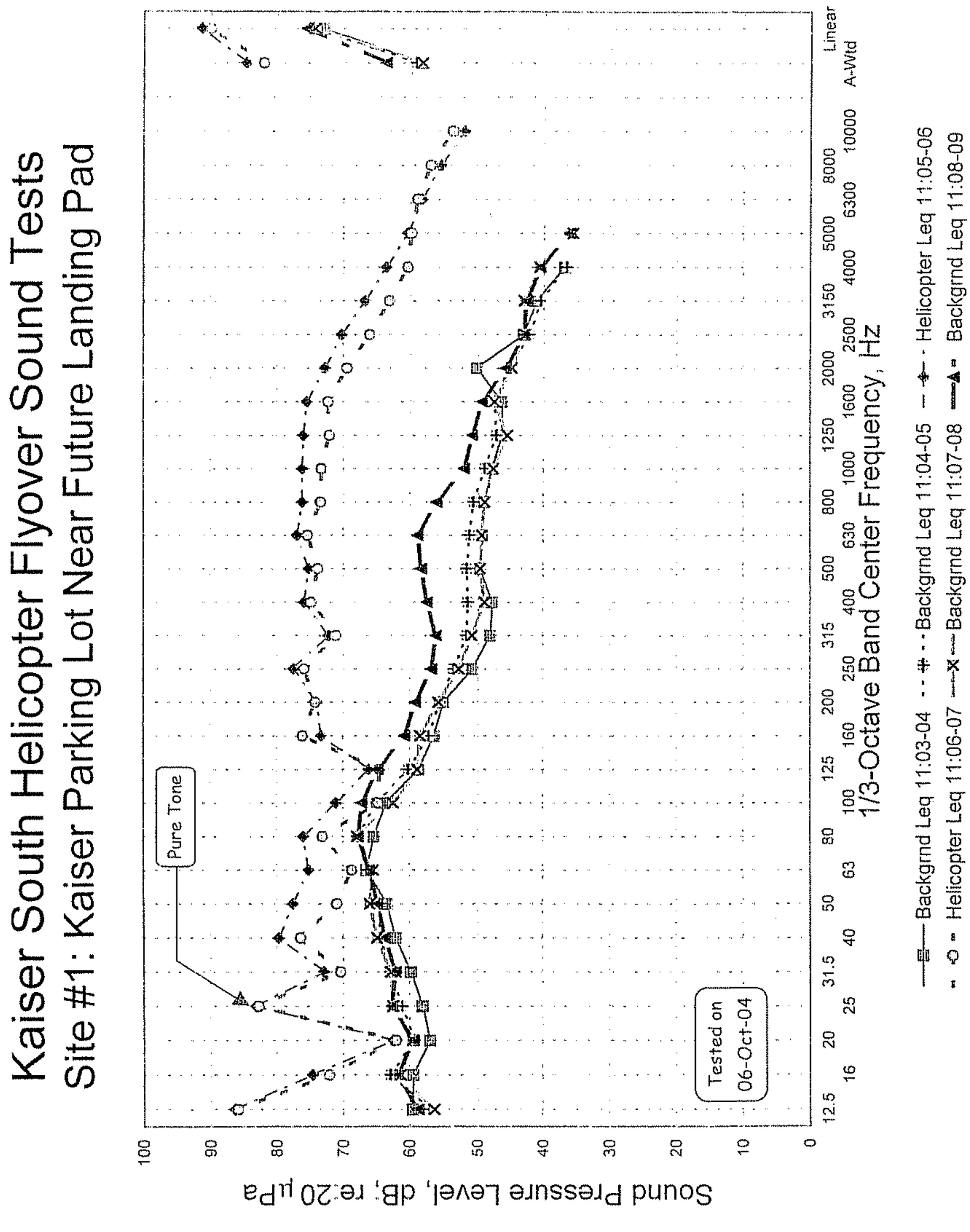

Figure 6. Tonal Content of Sound Measured at Position #1, 1-Minute Intervals With and Without Helicopter.

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July 14, 2005

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SUBJECT: Response to Questions Regarding Sound Impact Study for Emergency Helicopter Flights at Kaiser South Sacramento Medical Center

Dear Ms. Allen,

This letter report is in response to your request for answers to several sound study questions regarding the subject project [1]*. Hopefully, responses to those questions are given in this letter. The questions are paraphrased and numbered, then our answers are given.

1. Discuss inconsistencies in analysis regarding requirements of DEIR Noise Section, Land Use Compatibility chart.

    a. Inconsistencies do not exist between comments made in the noise impact study [2] report and the requirements of the Noise Element of the DEIR [3] and the City's General Plan [4]. First, the Noise Element of the General Plan has more than one set of requirements and the City has used more than one set of acceptable sound limits. The Land Use Compatibility chart says that residential development is "Conditionally Acceptable" for an L_{dn} sound level of 60 to 70 dB. The note at the bottom of the chart states that when the L_{dn} sound level falls into this range a noise study is needed, sound reduction options found and noise insulation included in the design. Noise insulation is a term applied only to the structure, the home, and is related to the sound reduction needed to meet the interior day-night average, L_{dn}, sound level limit of 45 dB. This says nothing about what is required in the backyard where sound reduction is discussed in terms of sound insertion loss, not noise insulation. Thus, the City does not clearly state what is the acceptable limit in the backyard or activity of single-family or multi-family homes. Ideally, the goal is to reach an L_{dn} of 60 dB in the backyard because this is the upper limit of the "Normally Acceptable" range, but the City has permitted up to 65 dB on most projects. The City does not have a specific statement in the Noise Element about the maximum allowable exterior L_{dn} sound level as does Sacramento County, West Sacramento, Davis, Citrus Heights, Elk Grove, Roseville, Placer County and numerous other jurisdictions. These other jurisdictions state that when meeting the 60 dB L_{dn} goal in activity areas is not feasible, a maximum L_{dn} sound level of 65 dB is to be used. Based on past projects, this L_{dn} sound level limit of 65 dB was applied to the residential areas evaluated. Since the predicted L_{dn} sound level from the helicopter flights was 51 dB, the question is moot because either of the City's limits was met.

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* - *Number in brackets refers to references listed at the end of this letter report.*

b. Table 1, Section 8-28 of the ***General Plan*** says that for all flight areas except those influenced by Sacramento International Airport operations, a CNEL of 65 dB is allowable in all residential activity areas. The helicopter is a rotary wing aircraft and this limit would apply to the homes near the hospital landing site as noted in the noise impact study [1]. The CNEL (Community Noise Equivalent Level) is considered interchangeable with the L_{dn} sound level. This gives a second reason for using the 65 dB L_{dn} sound level limit to evaluate the project. Again, this is irrelevant because the helicopter operations are predicted to generate an L_{dn} sound level of 51 dB for the worse scenario. This is less than the existing L_{dn} generated by all other background sound sources influencing homes near the hospital and the helicopter flight paths.

c. The first question also asked about the impact of the helicopter flights on the Kaiser's hospital. I am unaware of any requirement that a facility must meet any noise requirements when the sound is generated by their own operations. For example, the River Cats stadium has an L_{dn} sound limit of 75 dB. Where this applies is not clear, but since it is an open air facility, it could apply anywhere on the property. The likely hood that this limit is met on concert days or even during baseball games is small because the sound levels often average 90 to 100 dB(A) during these events. For example, a concert starting at 4:00 p.m. and running to 10:30 p.m. would result in an L_{dn} sound level of more than 90 dB. That is not grounds for saying the concerts can not be held as they choose to sponsor the concerts and expose themselves to the sound to make money. They may not expose those residential areas outside the stadium to excess sound, but what they do to themselves is their own business. The same applies to the helicopter flights. The hospital hopes to make money off the operations and to provide a valuable and life saving service. The noise they generate at their own facility is an issue only if they choose to make it one. In the best interest of their clients and patients, I hope they take into consideration the influence of the helicopter noise on their well being. The State [5] does require, according to my interpretation, that the interior L_{dn} sound level in all patient rooms be 45 dB or less due to sources exterior to the building. Again, since the helicopters generate an L_{dn} of only 51 to 66 dB, any standard construction will meet this requirement. Even this requirement is not enforced for activities undertaken by the hospital.

2. Provide information about potential helicopter flight designations.

   a. We were not provided with any designations, just the descriptions. We attempted to find designations, but found none. Art Negretti, from the Flight Safety Institute, believes that designations were not given to these paths.
   b. If he can provide such designations, we will forward them on to the City.

3. Explain the use of City's Noise Ordinance to evaluate noise impacts.

   a. Sound is not constant in most instances. Exceptions could be standing next to a very busy freeway where all other sources are over powered or masked. As a result, sound is described using various statistical descriptors. These include the average over 24-hours such as the L_{dn} or CNEL, the average over some time period such as 1-hour (the L_{eq} sound level), the sound exceeded 30 minutes in an hour (the L_{50} sound level), the sound level exceeded 15 minutes in an hour (the L_{25} sound level) and the maximum sound level (L_{MAX}). These are only a few of the potential statistical sound descriptors. The L_{eq} sound level is used to compute the L_{dn} and CNEL levels, which can not be measured directly, only calculated.

b. Only a few helicopter flights are expected on any given day. A maximum of two flights in a day was assumed with one during the day (7 a.m. to 10 p.m.) and one during the night (10 p.m. to 7 a.m.) for the noise impact study [1]. Such low volumes with such short exposure intervals result in very low L_{dn} sound levels. I believe that using only the Noise Element requirements to evaluate the noise impact does a disservice to the people living in the residential areas around the hospital. The L_{MAX} sound level and other descriptors may do a better job of providing information about the potential impact regarding sleep interference, speech interference and general interference with activities. For this same reason, the hospital should be concerned about the flights, but there is nothing in the City's Noise Element that requires TAVG to evaluate the proposed helicopter flights using these other descriptors.

c. The sound levels provided in Table III of TAVG's report [1] can not be compared with any of the requirements in the Noise Element because they are base on different descriptors. The L_{dn} sound level is computed from 24 1-hour L_{eq} sound level averages after adding a 10 dB penalty during nighttime hours, and can not be compared with the L_{eq} sound level during any 1-hour period. As noted above, the predicted L_{dn} sound level of 51 dB from helicopter flights is far lower than the City's limits. The impact is insignificant. We also concluded that the impact of helicopter flights was insignificant when compared with the City's Noise Control Ordinance. However, the City's ordinance only applies to non-transportation sound sources and the ordinance has no jurisdiction over helicopter flights. We used this as a second method because we understand the limitations of the Noise Element to judge the significance of these flights fully. This was above and beyond that which was required. The sound impacts of the emergency helicopter flights remain insignificant under all methods of evaluation.

4. Why did the report state that the City does not have noise requirements for hospitals?

a. The City does set several categories of compatible land use based on exterior L_{dn} sound levels including for hospitals. As noted earlier, when the exterior L_{dn} sound level falls into the "Conditionally Acceptable" range, sound "insulation" is to be included in the design. This addresses only sound reduction for the interior of the hospital and says nothing about whether the exterior sound level has to be reduced. Obviously, if this applied to the exterior of the hospital, the hospital could not have been built because the L_{dn} sound level along the property exceeds the L_{dn} sound level limit of 60 dB at every location. This is true of the psychiatric center also.

b. More importantly, sound generated by hospital activities is not to be evaluated for noise impacts on hospital property. Sources off hospital property or created by activities not associated with the hospital are the only ones that are to be evaluated with respect to land use compatibility and State standards.

c. The hospital is adding new air-conditioning equipment at the hospital that will be exterior to patient rooms. Kaiser is not required to evaluate the noise impacts of this equipment nor would anyone try because of the difficulty of deciding where on the property the limit was to be met.

5. Why did TAVG say that the CNEL is not the best descriptor for helicopter noise when the ***General Plan*** says it is to be used? The predicted exterior CNEL exceeds the City's limits.

a. As noted earlier, the CNEL is an average over 24-hours. With only two flights per day worse case, the average over a whole day is very low because the hourly average, L_{eq}, sound level is 0 for every hour for which there is no helicopter. The resulting average is low on residential property, less than 55 dB. This is "Normally Acceptable" and the impact is insignificant.

b. The helicopter flights are being done at the request and behest of the hospital. The ***General Plan*** does not require that the noise impact of a project be done on itself. Yes, the predicted L_{dn} or CNEL level at the airport landing point is 66 dB, but this is irrelevant. With local and distant traffic and certainly with ambulance movements, the L_{dn} sound level at the landing site already exceeds the 60 dB L_{dn} sound level that represents the upper end of the "Normally Acceptable" range of the Land Use Compatibility chart. This means that the hospital could not have been built, but it exists. If this were a problem, no hospital could have either ambulance or life flight helicopter events because the L_{dn} sound level would exceed the City's 60 dB limit.

6. The predicted exterior CNEL of 66 dB will result in interior L_{dn}/CNEL sound levels that exceed the State's 45 dB limit.

   a. The noise impact study notes that if windows are left open, the interior L_{dn} sound level will be about 15 dB. No windows are expected to be open in patient rooms.
   b. Standard sound reduction with closed windows is expected to be at least 25 dB. The resulting interior L_{dn} sound level would be 41 dB with this assumption. This meets the City and State's requirements with more than our standard 2 dB margin of safety. The impact is less than significant.
   c. One more time, the sound generated by activities undertaken by the hospital on patient rooms is not under the jurisdiction of the City. Only the hospital is responsible for sounds it generates whether from ambulance, HVAC equipment, trash compaction or helicopters. The hospital's best interests are served when it is concerned about this noise, but the Noise Element does not cover this condition. TAVG has been designing Kaiser's women and children's hospital in Roseville. Kaiser requested that we do sound tests of emergency helicopter landings and equipment at the central utility plant and design the exterior facade to meet their interior sound levels limits that are stiffer than the State's requirements. The City of Roseville did not require a noise impact study for these sound sources, but they did request such a study for road traffic sources. This is the appropriate approach to the issue.

I believe that all issues have been addressed. The noise impact study done by TAVG and dated December 8, 2005 correctly evaluated the noise from the emergency helicopter operations and the impacts.

Please call if there are any other comments regarding the responses to the questions you posed. Let me know if you have any other questions or if additional information is needed. Thanks.

Respectfully submitted,

Steve Pettyjohn

Steve Pettyjohn, Principal
Certified: Institute of Noise Control Engineers-1981

REFERENCES

1. D. Allen, "Subject: RE: Kaiser South Sac - Env Scope", e-mail message to Damon Polk, Lionakis Beaumont Design Group, May 18, 2005.

2. B.R. Smith and S. Pettyjohn, "Noise Impact Study of Proposed Emergency Helicopter Addition to Kaiser South Sacramento Facility Compared to Noise Limits", for Kaiser South Sacramento Medical Center, Capital Projects at Valley Point, Sacramento, by The Acoustics & Vibration Group, Sacramento, Project No. R04186, December 8, 2004.

3. City Planning Division, ***Draft Environmental Impact Report***, M85-049; SCH#86101310, March 1987.

4. Sacramento City Planning Commission, "Noise Element" from Chapter 8, "Health and Safety Element" from the ***City of Sacramento General Plan Updated***, Adopted January 19, 1988.

5. State Building Code, "Sound Transmission Control", Part 2, Title 24, C.B.C., Appendix Chapter 12, January 2002.

M E M O R A N D U M

To: Darcy Kremin JN 35-100490

From: Maria Cadiz

Date: August 17, 2005

Subject: Kaiser Permanente Expansion Project

Per your request, I have conducted a review of the *Noise Analysis for the Kaiser South Sacramento Expansion Project* as well as the responses provided to the City on July 14, 2005. In an effort to identify areas that would need to be updated and/or require additional detailed discussion. The following comments have been prepared in order to address concerns regarding the overall content as well as to critique the quantitative technical data utilized in determining the projected noise levels.

NOISE ANALYSIS

<u>Construction Noise</u>

- It is recommended that sensitive receptors within the vicinity of the proposed project are identified and analyzed in regards to construction noise impacts.

- The City of Sacramento provides the following exemptions for construction noise with the City's Municipal code:

  8.68.080 Exemptions.
  Noise sources due to the erection (including excavation), demolition, alteration or repair of any building or structure between the hours of seven a.m. and six p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between nine a.m. and six p.m. on Sunday; provided, however, that the operation of an internal combustion engine shall not be exempt pursuant to this subsection if such engine is not equipped with suitable exhaust and intake silencers which are in good working order. The director of building inspections, may permit work to be done during the hours not exempt by this subsection in the case of urgent necessity and in the interest of public health and welfare for a period not to exceed three days. Application for this exemption may be made in conjunction with the application for the work permit or during progress of the work.

However, since the Project site is a sensitive receptor itself, mitigation measures should also be included to ensure that proper noise attenuation is provided on-site and to adjacent sensitive receptors. Noise attenuation mitigation would include the following:

- *All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the Building Official.*

- *During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers, to the satisfaction of the Building Official.*

- *During construction and to the satisfaction of the Building Official, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors during construction activities.*

Mobile Source Noise

- The proposed Expansion Project would increase traffic along surrounding roadways, thereby increasing the noise levels within the area. A comparison of future without project and future with project scenarios should be analyzed in regards to mobile source noise. The overall impact of the proposed Project to the surrounding area should be determined and mitigation measures, if necessary, should be provided.

Stationary Noise Sources

- Page 3, 4c, of the Noise Study Response to Comments states that Kaiser is not required to evaluate the noise impacts associated with air-conditioning equipment. However, a discussion of stationary sources is necessary in order to insure that noise attenuation is provided. The expansion Project proposes to construct a structure directly across from residential units. Proper noise attenuation specifications such as providing proper screening on mechanical equipment or locating equipment as far from sensitive receptors as possible is required. Furthermore, the City of Sacramento *Municipal Code* provides the following noise standards regarding mechanical equipment:

  8.68.110 Residential pumps, fans and air conditioners.

  A. It is unlawful for any person to operate any residential fans, air conditioners, stationary pumps, stationary cooling towers, stationary compressors, similar mechanical device or any combination thereof installed after the effective date of this chapter in any manner so as to create any noise which would cause the maximum noise level to exceed:
  1. Sixty (60) dBA at any point at least one foot inside the property line of the affected residential or agricultural property and three to five feet above ground level;

RBF CONSULTING

M E M O R A N D U M

To: Darcy Kremin, MS 1000 JN 35-100490

From: Maria Cadiz, MS 900

Date: October 6, 2005

Subject: Kaiser Permanente Expansion Project Vehicular Noise Analysis

---

Significance of Changes in Ambient Noise Levels

A project is considered to have a significant noise impact when it causes an adopted noise standard (criterion) to be exceeded at the project site or for adjacent sensitive receptors.

In addition, it is important to consider the existing ambient noise environment. If the ambient noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur. Lacking adopted standards for evaluating such impacts, a general standard for community noise environments is that a change of over 5 dBA, regardless of the ambient noise level without project, is readily noticeable and is therefore considered a significant impact; refer to Table 1 (Significance of Changes in Cumulative Noise Exposure). In areas where the ambient noise level without project is 60 – 65 dBA, some individuals may notice an increase in the ambient noise level of greater than 3 dBA so an increase of 3 dBA or more is considered significant.

Further increases in community noise levels by 1.5 dBA or more in areas where the ambient noise level is greater than 65 dBA is also considered a significant impact, because the increase would contribute to an existing noise deficiency.

Potential impacts are grouped below according to topic. The numbered mitigation measures at the end of this Section directly correspond with the numbered impact statements.

Table 1 Significance of Increases in Cumulative Noise Exposure

Ambient Noise Level Without Project (Ldn or CNEL)	Significant Impact Is Assumed if the Project Increases Ambient Noise Levels by:
< 60 dBA	+ 5.0 dBA or more
60 - 65 dBA	+3.0 dBA or more
> 65 dBA	+1.5 dBA or more
dBA = A-weighted decibel; CNEL = community noise equivalent level; Ldn = day/night average noise level.	

Source: U.S. Environmental Protection Agency Office of Noise Abatement and Control, *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*, October 1979 (revised July 1981).

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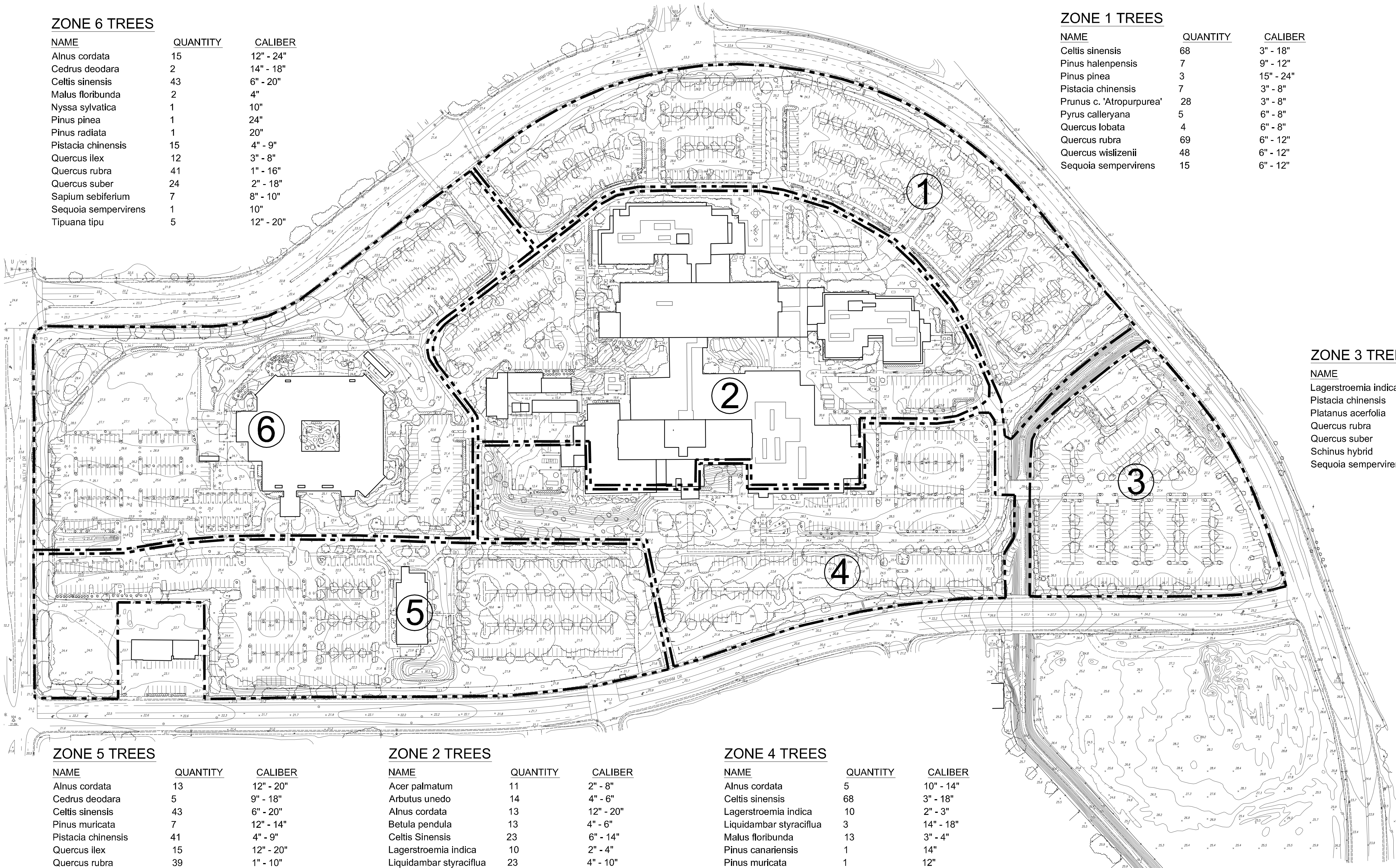

ZONE 6 TREES

NAME	QUANTITY	CALIBER
Alnus cordata	15	12" - 24"
Cedrus deodara	2	14" - 18"
Celtis sinensis	43	6" - 20"
Malus floribunda	2	4"
Nyssa sylvatica	1	10"
Pinus pinea	1	24"
Pinus radiata	1	20"
Pistacia chinensis	15	4" - 9"
Quercus ilex	12	3" - 8"
Quercus rubra	41	1" - 16"
Quercus suber	24	2" - 18"
Sapium sebiferium	7	8" - 10"
Sequoia sempervirens	1	10"
Tipuana tipu	5	12" - 20"

ZONE 1 TREES

NAME	QUANTITY	CALIBER
Celtis sinensis	68	3" - 18"
Pinus halenpensis	7	9" - 12"
Pinus pinea	3	15" - 24"
Pistacia chinensis	7	3" - 8"
Prunus c. 'Atropurpurea'	28	3" - 8"
Pyrus calleryana	5	6" - 8"
Quercus lobata	4	6" - 8"
Quercus rubra	69	6" - 12"
Quercus wislizenii	48	6" - 12"
Sequoia sempervirens	15	6" - 12"

ZONE 3 TREES

NAME	QUANTITY	CALIBER
Lagerstroemia indica	18	2" - 3"
Pistacia chinensis	15	3" - 8"
Platanus acerfolia	24	8" - 12"
Quercus rubra	18	6" - 10"
Quercus suber	10	6" - 18"
Schinus hybrid	17	6" - 10"
Sequoia sempervirens	15	6" - 12"

ZONE 5 TREES

NAME	QUANTITY	CALIBER
Alnus cordata	13	12" - 20"
Cedrus deodara	5	9" - 18"
Celtis sinensis	43	6" - 20"
Pinus muricata	7	12" - 14"
Pistacia chinensis	41	4" - 9"
Quercus ilex	15	12" - 20"
Quercus rubra	39	1" - 10"
Quercus suber	10	2" - 20"
Sapium sebiferium	2	5" - 10"
Tipuana tipu	2	5" - 10"

ZONE 2 TREES

NAME	QUANTITY	CALIBER
Acer palmatum	11	2" - 8"
Arbutus unedo	14	4" - 6"
Alnus cordata	13	12" - 20"
Betula pendula	13	4" - 6"
Celtis Sinensis	23	6" - 14"
Lagerstroemia indica	10	2" - 4"
Liquidambar styraciflua	23	4" - 10"
Maytenus boaria	2	8" - 10"
Nyssa sylvatica	2	6"
Pinus chinensis	1	20"
Pinus halenpensis	11	12" - 20"
Podocarpus gracilior	16	4" -6"
Prunus c. 'Atropurpurea'	2	8" -10"
Pyrus calleryana	27	3" - 12"
Quercus coccinea	6	2" - 3"
Quercus ilex	10	9" - 14"
Quercus rubra	5	4" - 10"

ZONE 4 TREES

NAME	QUANTITY	CALIBER
Alnus cordata	5	10" - 14"
Celtis sinensis	68	3" - 18"
Lagerstroemia indica	10	2" - 3"
Liquidambar styraciflua	3	14" - 18"
Malus floribunda	13	3" - 4"
Pinus canariensis	1	14"
Pinus muricata	1	12"
Pistacia chinensis	16	2" - 4"
Platanus acerfolia	8	4" - 6"
Pyrus calleryana	11	3" - 6"
Quercus coccinea	14	1" - 3"
Quercus ilex	33	8" - 20"
Quercus lobata	3	5" - 10"
Quercus rubra	46	4" - 12"
Quercus virginiana	27	2" - 8"
Sapium sebiferium	5	10" - 12"
Sequoia sempervirens	6	12" - 16"

LBDG #23125

SCALE: 0 80 160 320

KAISER PERMANENTE SOUTH SACRAMENTO MEDICAL CENTER

SITE TREE INVENTORY

DATE: 11.30.04 SHEET L1.0

// NORTH CENTRAL INFORMATION CENTER
CSU-SACRAMENTO - 6000 J STREET, ADAMS BLDG., #103- SACRAMENTO, CA 95819-6100
916-278-6217 ncic@csus.edu FAX 916-278-5162

October 19, 2005 File No: SAC-05-213

Darcy Kremin
RBF Consulting
500 Ygnacio Valley Road, Suite 270
Walnut Creek, CA 94595-3847

Re: Expedited Record Search Results for **Kaiser Medical Center Expansion Project**
6600 Bruceville Road, T 7N/R 5E Section 10, Florin 7.5' USGS Quad, Sacramento County, CA

Dear Ms. Kremin;

Per your request received by our office on October 18, 2005, a records search for the above referenced project was conducted by reviewing the State of California Office of Historic Preservation records, base maps, historic maps, and literature for Sacramento County on file at this office. Although it is believed that a records search was conducted for the subject parcel in 1991, no information could be located regarding this records search or any associated field investigation. Some of the data below may therefore duplicate information contained in this earlier records search. Review of our references indicates that the proposed project area contains no recorded prehistoric or historic archaeological resources listed with the California Historical Resources Information System (CHRIS). Four reports were located concerning archaeological surveys within or adjacent to the current project area; none of these investigations resulted in the recordation of cultural resources in the current project vicinity. State and Federal inventories list no historic properties (buildings, structures, objects, or districts) within the proposed project area.

The project area is located in geographic region that, at the time of European contact, was occupied by the Valley Nisenan (Wilson and Towne 1978). The Nisenan and their predecessors inhabited the American, Yuba, and Bear River drainages for at least 4,500 years before the first Euroamerican settlers arrived (Moratto 1984). Major prehistoric archaeological sites in this portion of Sacramento County tend to be situated on elevated ridges or terraces adjacent to creeks or major water courses, with several known large village sites adjacent to the American and Sacramento Rivers (Wilson and Towne 1978:388). The current project area is located on a generally flat plain crossed by several small streams. Portions of these streams have been canalized in the past century, including the branch of Beacon/Union House Creek that crosses the project area. The 1909 edition of the Florin USGS Quad shows the original course of the creek slightly to the southwest of its current alignment. A 1974 archaeological survey of the Morrison Stream Group (including Beacon, Elder, and Strawberry Creeks) found no evidence of prehistoric habitation in the project vicinity, although several significant archaeological sites were identified more than three miles to the southwest (Johnson 1974, NCIC #88). In recent decades, much of the land south of Sacramento has become increasingly urbanized, reducing the possibility of finding intact archaeological deposits during survey investigations. Given the environmental setting and the degree of modern development on the subject parcel, there is a low potential for finding prehistoric archaeological sites during the proposed undertaking.

Historical literature and maps consulted did not indicate the presence of any historic-period resources in the immediate project area, although early maps show "Upper Stockton Road" (now Stockton Boulevard/US 99) at least as early as 1855. The 1855 GLO Plat of Township 7N/Range 5E shows this road and "Metcalf's House" in the southwest quarter of Section 10; agricultural fields are shown to the south and west of the project area. The 1909 Florin USGS Quad shows little development in the South Sacramento area; Upper Stockton Road and a portion of Mack Road are shown, and a single building is identified in the southwest quarter of Section 10. It is unclear if this is the same house shown on the plat. By 1968, the Florin USGS Quad shows the four-lane Highway 99 and several other local roads, including Valley Hi Drive and part of Wyndham. Beacon/Union House Creek also appears on this quad in canalized form. However, no buildings are shown in the current project parcel on the 1968 edition quad or the 1980 photorevisions. Based on this information, the proposed activity can be considered to have a low probability of affecting historic-period archaeological sites or properties.

LITERATURE REFERENCED DURING SEARCH: In addition to the official records and maps for archeological sites and surveys in Sacramento County, the following historic references were also reviewed: the National Register of Historic Places and California Register of Historic Resources - Listed Properties (2005) and Determinations of Eligibility (2005); the California Inventory of Historic Resources (1976); California State Historical Landmarks (1996 and updates); California Points of Historical Interest (1992 and updates); Gold Districts of California (Clark 1979); Directory of Properties in the Historical Resources Inventory (Office of Historic Preservation Aug. 2005); Caltrans State and Local Bridge Surveys (1987 and 2000); Historic Spots in California (Hoover et al. 1966 and 1990); California Archaeology (Moratto 1984); and the Smithsonian Institution's Handbook of North American Indians, Volume 8, California (Wilson and Towne 1978:387-389).

NCIC LIBRARY REPORTS CONSULTED:

NCIC #88 (Johnson, Jerald J. 1974) "Reconnaissance Archaeological Survey of the Morrison Stream Group in Sacramento County, California"

NCIC #109 (Bass, Henry 1983) "Department of Transportation Negative Archaeological Survey Report: 3-SAC-99, P.M. 17.3/17.7"

NCIC #653 (Carrillo, Carlos C. and Henry O. Bass 1981) "Archaeological Survey Report for the Proposed Mack Road Interchange Improvement Project: 03-SAC-99, P.M. 16.8/18.3"

NCIC #3573 (Miley Paul Holman 1994) "Archaeological Field Inspection of an 3.33 Acre Parcel North of Wyndham Drive at Bruceville Road, Sacramento"

RECOMMENDATIONS:

1) There is a low possibility of identifying prehistoric or historic-period cultural resources in the project area; therefore, no further archival or field study by a cultural resource professional is recommended at this time.

2) Review for possible historic structures has included only those sources listed in the attached bibliography and should not be considered comprehensive. The Office of Historic Preservation has determined that buildings, structures, and objects 45 years or older may be of historical value. If the area of potential effect contains such properties not noted in our research we recommend that the agency responsible for CEQA/NEPA compliance consult with the Office of Historic Preservation regarding potential impacts to these properties.

Project Review and Compliance Unit
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001
(916) 653-6624

3) If cultural resources are encountered **<u>during the project</u>**, avoid altering the materials and their context until a cultural resource consultant has evaluated the situation. <u>Project personnel should not collect cultural resources</u>. Prehistoric resources include chert or obsidian flakes, projectile points, and other flaked-stone artifacts; mortars, pestles, manos, and other groundstone tools; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; mine shafts, tailings piles, or ditches; and refuse deposits or bottle dumps, often located in old wells or privies.

4) Identified cultural resources should be recorded on DPR 523 (A-J) historic resource recordation forms, available at www.ohp.parks.ca.gov.

Thank you for using our services. Please contact our office at (916) 278-6217 if you have any questions about this records search, or for our list of qualified cultural resource consultants. Two copies of a confidentiality agreement/billing statement are enclosed; please sign and return the bright yellow copy with your payment.

Sincerely,

Jennifer Bowden
Researcher

Public Comments

6538 Wyndham Drive
Sacramento, CA 95823

RECEIVED NOV 17 2005

Dana Allen, Senior Planner
City of Sacramento
Development Services Dept.
2101 Arena Blvd., 2nd Floor
Sacramento, CA 95834

Dear Senior Planner,

These are my comments regarding the proposed expansion on the Kaiser South campus.

I have been a resident at the Orangewood Apartments bordering the south side of Kaiser (Wyndham Drive) for 35 years. There is already no quality of life in this neighborhood.

The noise is unbearable: from the fire engine sirens (there is a fire station on the corner); from ambulances arriving at Kaiser; from the freeway cars and from the police car sirens from multiple police car pursuits on the freeway (the police chase a car with a group of their cars); from police helicopters (this is a high crime area); and from the car stereos in front of the corner 7-11 store (across from the fire station).

During previous construction projects at Kaiser, they worked at night, and every time a construction truck backed-up we heard "ding, ding, ding," and it was impossible to sleep for many months. Please, at least don't allow that to happen again.

The air quality has no quality. Everyone here has to close their windows at night (starting around an hour after dark) because of nauseating vehicle fumes that come from the nearby freeway. It is much worse & diesel-like in the winter.

In the two huge apartment complexes that border Kaiser South are many elderly, sick people who like to be close to Kaiser. They are Kaiser members. With all that they already tolerate, as I described above, do they need ~~need~~ the loud noise from trauma center helicopters landing across the street?

There have been a couple of occasions when medical helicopters have landed across the street at Kaiser. It is much, much noisier than when a police helicopter passes overhead.

The new Elk Grove Kaiser is only 10 minutes away by car. Why don't they build (expand) down there instead? There is no high density housing there.

I know my comments will be ignored, because "progress" comes first, especially if it is medical. . . but could you at least not allow them a permit to work at night?

Thank you for your time.

Sincerely,

Fred B. Katz

Fred B. Katz
November 5, 2005

Kaiser NOP Comments:

11/7 Rick Encarnation #916) 600-7116
Wyndham & Lindbrook Way - parking on streets already impacting neighbors parking (employees) (pay for parking?) Existing problem. During construction, worse impacts?

11/8 Mary Eastman #916) 682-6913 (in apt)
Nighttime construction noise.
Build garage first. Parking on Wyndham & btwn apt complexes. Circulation, road degeneration.

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
VENTURE OAKS, MS 15
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
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RECEIVED
NOV 28 2005

November 21, 2005

05SAC0182
03-SAC-99 PM 17.656
Kaiser Permanente South Sacramento (P04-185)
Medical Center Expansion
Notice of Preparation
SCH#2005102127

Ms. Dana Allen, Senior Planner
City of Sacramento
Development Services Department
2101 Arena Boulevard, Second Floor
Sacramento, CA 95834

Dear Ms. Allen:

Thank you for the opportunity to review and comment on the proposed medical center expansion project. Our comments are as follows:

- Our comments in our letter of June 6, 2005 (copy enclosed) are still valid.

- Given the additional specific information provided in the Notice of Preparation, the 240,000 square feet of added medical offices and proposed parking at the Kaiser Permanente South hospital could generate approximately 363 AM and 404 PM peak hour trips. Changes in the pattern and volumes of overall traffic near the State Route 99/Bruceville Road ramps and the SR99/Mack Road Interchange could be significant. To assess any potential traffic impacts, a Traffic Impact Study (TIS) will be necessary. For a traffic assessment of the aforementioned State freeway locations, we recommend the traffic analysis methodologies provided in the Caltrans TIS guidelines at our website. The traffic analysis should provide a Level of Service (LOS) analysis for the SR99/Mack Road Interchange and Bruceville Road freeway ramps and ramp terminal intersections. We would appreciate the opportunity to review the scope of the traffic study before the study begins.

- To mitigate this project's trip generation, we suggest all mode split opportunities be explored. For example, measures to improve access to the proposed Phase 2 Sacramento Regional Transit "South Line" light rail stations could be implemented, along with the provision of specialized transit parking areas to accommodate, encourage and heighten the convenience of increased city bus, senior medical service bus pools, paratransit and shuttle bus use. We also support efforts by the City of Sacramento to assist the project proponents in improving pedestrian linkages between potential transit parking areas and expanded hospital facilities. The last page of the Notice of Preparation indicates in the "Traffic" section that the proposed project would modify vehicle circulation, reconfigure existing parking lots, and analyze pedestrian, bicycle, and transit systems within the hospital campus.

- Direct and lighted pedestrian access throughout the hospital areas and at transit stops should be planned that incorporates Americans with Disabilities Act (ADA) features (i.e., scalloped curbing for wheelchairs is recommended).

- The California Environmental Quality Act (CEQA) and Public Resources Code Sections 21081.4, 21081.6 and 21081.7, were amended to mandate that lead agencies under CEQA provide the California Department of Transportation with information on transportation-related mitigation monitoring measures for projects that are of statewide, regional, or area-wide significance. The enclosed "Guidelines for Submitting Transportation Information from a Reporting or Monitoring Program to the Department of Transportation" (MM Submittal Guidelines) discuss the scope, purpose and legal requirements for mitigation monitoring reporting and submittal. They also specify the generic content for these reports and explain procedures for the timing, certification and submittal of the required reports. This 793,500 square foot hospital has the potential for impacts that are of regional or area-wide significance. Therefore, the enclosed Mitigation Monitoring Certification Checklist form should be completed and submitted to our office when applicable mitigation measures are approved, and again when they are completed for all improvements related to the Kaiser Permanente South Medical Center Expansion project.

- We recommend the consideration of "refuge islands" to enhance pedestrian safety at any wider roadway crossings in and around the hospital complex.

Please provide our office with a copy of the draft TIS and relevant mitigation for this project. We would appreciate seeing the results of the traffic study as early as possible. If you have any questions regarding these comments, please contact Ken Champion at (916) 274-0615.

Sincerely,

Katherine Eastham

KATHERINE EASTHAM, Chief
Office of Transportation Planning – Southwest

c: Don Smith, Sacramento Regional Transit
Scott Morgan, State Clearinghouse

Enclosures

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
VENTURE OAKS, MS 15
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 274-0614
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June 6, 2005

05SAC0089
03-SAC-99 PM 17.656
Kaiser South Sacramento Medical Center Hospital Expansion
Application (P04-185)

Ms. Heather Forest
City of Sacramento
Planning Division
1231 I Street, Room 300
Sacramento, CA 95814

Dear Ms. Forest:

Thank you for the opportunity to review and comment on the above referenced project proposal. Our comments are as follows:

- Caltrans preliminary assessment of this project indicates that it could generate over 100 AM and PM peak hour vehicle trips. This level of new trips will add to the traffic using the State Route (SR) 99 Mack Road Interchange and Bruceville Road freeway ramps. Caltrans requests that a focused traffic analysis of the interchange and ramp intersections be performed to determine if any traffic impacts will occur from the added project traffic.

- A "Guide for the Preparation of Traffic Impact Studies" can be obtained from http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/ .

- The traffic study should provide a Level of Service (LOS) analysis for the interchange ramps and ramp terminal intersections. A merge/diverge analysis should be performed for freeway and ramp junctions and all analysis should be based on AM and PM peak hour volumes. The analysis should include the (individual, not averaged) LOS and traffic volumes applicable to all intersection road approaches and turn movements. The procedures contained in the Year 2000 Highway Capacity Manual should also be used as a guide for the traffic study.

- The traffic study should incorporate the following scenarios:

  Existing conditions with and without the project
  Cumulative conditions with and without the project

- Mitigation measures should be identified where the project would have a significant impact. Caltrans considers the following to be significant impacts:

  - Off-ramps with vehicle queues that extend into the ramp's deceleration area or onto the freeway.

  - Vehicle queues at intersections that exceed existing lane storage.

  - Project traffic impacts that cause any ramp's merge/diverge Level of Service (LOS) to be worse than the freeway's LOS.

  - Project impacts that cause the freeway or intersection LOS to deteriorate beyond LOS E for freeway and LOS D for highway and intersections. (If the LOS is already "E" or "F", then a quantitative measure of increased queue lengths and delay should be used to determine appropriate mitigation measures.)

- Possible mitigation measures to consider and corroborate with the traffic analysis include coordination of the following improvements with the project "build out":

  - Improving SR 99 Mack Road Interchange and Bruceville Road signal phasing and timing
  - Widening interchange ramps to increase capacity
  - Modifying ramp terminal intersections
  - Assessing right-of-way dedication needs for widened ramps and mainline merge areas
  - Assessing the need for any ramp metering improvements
  - Assess the need for any Phase 2 Regional Transit "South Line" light rail transit connection improvements on Bruceville Road

- The analysis of future traffic impacts should be based on a 20 year planning horizon.

- Full consideration should be provided for pedestrians, bicyclists, and transit users, in the design of this site layout, including support facilities throughout.

Please provide our office with any further actions regarding this project and a copy of the traffic study. If you have any questions regarding these comments, please contact Ken Champion at (916) 274-0615.

Sincerely,

Original Signed By

KATHERINE EASTHAM, Chief
Office of Transportation Planning - Southwest

c: Scott Morgan, State Clearinghouse

GUIDELINES FOR SUBMITTING TRANSPORTATION INFORMATION FROM A REPORTING OR MONITORING PROGRAM TO THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (DEPARTMENT)

INTRODUCTION

The California Environmental Quality Act (CEQA) requires, under Public Resources Code (PRC) Section 21081.6, the adoption of reporting or monitoring programs when public agencies include environmental impact mitigation as a condition of project approval. Reporting or monitoring takes place after project approval to ensure implementation of the project in accordance with mitigation adopted during the CEQA review process.

Assembly Bill 1807 (effective January 1, 2001) amended the PRC in a number of ways. Section 21080.4 was amended to add a requirement that lead agencies submit Notices of Preparation (NOPs) to the Governor's Office of Planning and Research when they determine that an environmental impact report will be required to approve a project.

Section 21081.7 was amended with two additional provisions. The first provision required that transportation information resulting from a reporting or monitoring program adopted by a public agency in accordance with Section 21081.6 be submitted to the Department of Transportation (Department) when a project has impacts that are of statewide, regional, or area-wide significance. The second provision required that the Department adopt guidelines for the submittal of those reporting or monitoring programs.

PURPOSE

The purpose of these guidelines is to establish clear and consistent statewide procedures to be used by both Department District Intergovernmental Review (IGR) Program Coordinators to identify the scope and timing of transportation information needed from lead agencies, and public agencies when submitting transportation information to the Department, in accordance with Section 21081.7.

PROCEDURES

A. The District IGR Program Managers and/or Coordinators shall:

1. Prior to implementation of mitigation measures:

   a. Notify the CEQA lead agency by letter during "early consultation," the Notice of Preparation (NOP) stage, or the Initial Study (IS) phase of the CEQA review process that the transportation information included in the reporting or monitoring program will need to be provided to the Department following project mitigation agreement.

   b. Provide the name, address, and telephone number of the District IGR contact to the lead agency.

   c. Provide, as an enclosure to the notification letter, a copy of these "Guidelines" and the Department's "CEQA Lead Agency Checklist/Certification" form. (Part 1 of the form, *Checklist*, is to be signed by the lead agency following project approval, and a copy submitted to the District along with the transportation reporting or monitoring information. Part 2 of the form, *Certification*, is to be signed by the lead agency and the District upon implementation of all agreed-upon mitigation measures.)

2. Following implementation of mitigation measures as identified in Part 1, *Checklist*, of the CEQA Lead Agency Checklist/Certification form, and certification of implementation by the lead agency in Part 2, *Certification*:

   Ensure sign off of Part 2, indicating that the mitigation measures have been implemented.

   1) If the project required encroachment onto a state highway, obtain the District Permit Engineer's signature in Part 2.

   2) If the project did not involve encroachment onto a state highway, the District IGR Coordinator shall sign Part 2.

3) The District IGR Coordinator shall: (a) Retain the original document; (b) forward a copy to the District Permit Engineer (if the Permit Engineer signed Part 2); (c) forward a copy to the Department's Headquarters IGR Program Manager; and, (d) send a copy to the lead agency.

B. The CEQA lead agency shall:

1. Following project approval:

Submit the following information to the Department District IGR contact:

1) Name, address, and telephone number of the CEQA lead agency contact responsible for the mitigation reporting or monitoring program.

2) Location and custodian of the documents or other material, which constitute the record of proceedings upon which the lead agency's decision to approve the project is based.

3) Assurances that the Department can obtain copies of the aforementioned documents and materials, if needed, to clarify details or resolve issues related to the mitigation adopted.

4) Detailed information on impact assessment methods, the type of mitigation, specific location, and implementation schedule for each transportation impact mitigation measure included in the reporting or monitoring program.

5) A copy of the "CEQA Lead Agency Checklist/Certification" form, with Part 1, *Checklist*, signed and dated, and the reporting or monitoring program transportation information attached or enclosed. The CEQA lead agency, at its discretion, may submit the complete reporting or monitoring program with the required transportation information highlighted.

2. Following implementation of mitigation measures:

   a. Sign and date Part 2, *Certification,* of the "CEQA Lead Agency Checklist/Certification" form.

   b. Forward the "CEQA Lead Agency Checklist/Certification" form, with appropriate completion documents attached, to the District IGR contact, certifying that the mitigation measures agreed upon and identified in the reporting or monitoring program have been implemented, and that all other reporting requirements have been adhered to, in accordance with PRC Sections 21081.6 and 21081.7.

APPROVED:

Brian J. Smith 8 July 04
BRIAN J. SMITH — Date
Deputy Director
Planning and Modal Programs

L. H. Orcutt 7-9-04
LARRY ORCUTT — Date
Acting Deputy Director
Maintenance and Operations

CEQA LEAD AGENCY CHECKLIST/CERTIFICATION *

TRANSPORTATION INFORMATION FROM A REPORTING OR MONITORING PROGRAM

Part 1 - Checklist

Project Name: ______________________________

Lead Agency: ______________________________

Lead Agency Contact (Name, Title, Agency, Address & Phone): ______________________________

____

State Clearinghouse (SCH) File #/s: ______________________________

Document Type/s: ______________________________

Findings & Approval Date/s: ______________________________

____

Project Proponent (Name, Title, Company, Address & Phone): ______________________________

____

For each specific Transportation Related Mitigation Measure associated with this Project, <u>The following information items are included in the attached materials</u>:

Yes	No	
☐	☐	**Location/Custodian Of CEQA Documents, Proceedings, Records**
☐	☐	**Description Of How To Obtain Copies Of Above Documents**
☐	☐	**Mitigation Measure Name & Identifying Number**
☐	☐	**Detailed Description of Measure & its Purpose (attach blueprints if necessary)**
☐	☐	**Measure Location Description, Latitude/Longitude, & Vicinity Map**
☐	☐	**Location of Impacted State Highway Component (County, Route, Postmile)**
☐	☐	**Caltrans Encroachment Permit Number (if one was needed)**
☐	☐	**Copy of Other Agency Permits required for this Measure (if needed)**
☐	☐	**Completion Criteria (including detailed performance objectives)**
☐	☐	**Implementation Schedule**
☐	☐	**Estimated Monetary Value of Completed Measure & % Local Agency Funded**
☐	☐	**Responsible Contractor (Name, Company, Address & Phone)**

The above project mitigation measures will be implemented as indicated in the adopted reporting or monitoring program, and the California Department of Transportation will be notified upon implementation.

______________________________ ______________________________

CEQA Lead Agency **Date**

Part 2 - Certification

We certify that the agreed upon mitigation measures have been implemented, and all other requirements have been adhered to, in accordance with PRC Sections 21081.6 and 21081.7. <u>Attached</u>: <u>1. Completion evaluation (including field inspection reports)</u>; <u>2. Photograph of completed measure</u>.

Signature & Date: ______________________________ ______________________________

Name: ______________________________ ______________________________

Title: ______________________________ ______________________________

CEQA Lead Agency **California Department of Transportation**

* This form is to be used by public agencies to submit their mitigation reporting or monitoring programs to the California Department of Transportation (Department) when a CEQA project has been found to have transportation or circulation impacts that are of statewide, regional, or area-wide significance. Copies of this form, and the Department Guidelines developed pursuant to PRC Section 21081.7, can be downloaded from our website (<u>http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_guidelines_procedures.htm</u>). Completed form with attached materials may be post-mailed, <u>e-mailed</u>, or faxed to the appropriate Department District Planning Office, Attention: Intergovernmental Review (IGR) Coordinator. (Form Version 07/2004)

DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS – M.S #40
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
PHONE (916) 654-4959
FAX (916) 653-9531
TTY (916) 651-6827

Flex your power!
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November 22, 2005

Ms. Dana Allen
City of Sacramento
1231 'I' Street, Room 300
Sacramento, CA 95814

Dear Ms. Allen:

Re: City of Sacramento's Notice of Preparation of a Draft Environmental Impact Report for Kaiser Permanente South Sacramento Medical Center Expansion Including a Heliport; SCH# 2005102127

The California Department of Transportation (Caltrans), Division of Aeronautics (Division), reviewed the above-referenced document with respect to airport-related noise and safety impacts and regional aviation land use planning issues pursuant to the California Environmental Quality Act (CEQA). The Division has technical expertise in the areas of airport operations safety and airport land use compatibility. We are a funding agency for airport projects and we have permit authority for public and special use airports and heliports. The following comments are offered for your consideration.

The proposed expansion of the Kaiser Permanente South Sacramento Medical Center includes a heliport (helicopter landing pad) for the "new trauma center."

The proposed heliport will require the issuance of a State Heliport Permit by the Division of Aeronautics. Information regarding the State Heliport Permit process is available on-line at http://www.dot.ca.gov/hq/planning/aeronaut/htmlfile/heliportpermit.php. The applicant should also be advised to contact the Division's Aviation Safety Officer for Sacramento County, Patrick Miles, at (916) 654-5376, for assistance with the State permit requirements.

Prior to issuing the State Heliport Permit, as a Responsible Agency, we must ensure that the proposal is in full compliance with CEQA. The issues of primary concern to us include heliport-related noise and safety impacts on the surrounding community. To ensure that the community will not be adversely impacted by helicopter operations, flight paths should avoid noise-sensitive and people intensive uses. Environmental documentation should include the anticipated number of operations, daytime and/or nighttime use, *a noise study with heliport noise contours*, diagrams showing the proposed landing site and the approach/departure flight paths. The diagrams should also depict the proximity of the proposed flight paths to any existing or proposed noise sensitive or people intensive uses. Consideration given to the issue of compatible land uses in the vicinity of a heliport should help to relieve future conflicts between the heliport and its neighbors.

The proposal must be submitted to the Sacramento Area Council of Governments (SACOG), which represents the Airport Land Use Commission (ALUC).

In addition, existing and proposed structures in the vicinity of the proposed heliport site should not be at a height that will result in penetration of the approach imaginary surfaces. If the heliport is planned for operation prior to completion of the later phases of construction activities, impacts to the heliport imaginary surfaces from temporary construction-related impacts (e.g. construction cranes, etc.) should also be identified.

Please note the Federal Aviation Administration (FAA) will require the filing of a Notice of Landing Area Proposal (Form 7480-1). A copy of the form is available on the FAA website at http://www.faa.gov/ARP/ane/forms/7480-1.pdf.

These comments reflect the areas of concern to the Division of Aeronautics with respect to airport-related noise and safety impacts and regional airport land use planning issues. We advise you to contact our district office concerning surface transportation issues.

Thank you for the opportunity to review and comment on this proposal. If you have any questions, please call me at (916) 654-5314.

Sincerely,

Sandy Hesnard

SANDY HESNARD
Aviation Environmental Specialist

c: State Clearinghouse, Greg Chew-SACOG

SACRAMENTO METROPOLITAN
AIR QUALITY
MANAGEMENT DISTRICT

Larry Greene
AIR POLLUTION CONTROL OFFICER

November 28, 2005

Ms Dana Allen
Devlopment Services Department
City of Sacramento
2101 Arena Blvd, Second Floor
Sacramento, CA 95834

SUBJECT: Notice of Preparation of a Draft EIR for the KAISER PERMANENTE SOUTH SACRAMENTO MEDICAL CENTER EXPANSION, P04-185, SMAQMD # SAC200400247C

Dear Ms. Allen:

Thank you for sending this project to the Sacramento Metropolitan Air Quality Management District (District) for staff review and comment. Staff comments follow.

Due to the size and scope of this project, it seems likely that the project will generate significant construction and operational-related air quality impacts An air quality analysis of both construction and operational impacts should be done in conjunction with the environmental document. A copy of the model analysis should be included in the document.

If construction impacts exceed the District threshold, we recommend the District standard construction mitigation be required as well as any other feasible mitigation, including an off-site mitigation fee. If a fee is required, it should be identified by amount in the DEIR.

If operational impacts exceed the District threshold, we recommend the preparation and finalization of an Air Quality Mitigation Plan which would be designed to reduce operational emissions by 15%. We would be happy to work with the proponents as soon as possible on this plan, helping them choose the most appropriate measures from a list of measures which we have crafted This Air Quality Mitigation Plan should be endorsed by us and published in the DEIR In particular, we would be very interested in seeing parking pricing and incentives for alternative transportation modes implemented through this Plan. Please ask the proponent to contact us as soon as possible if the operational impacts are found to be significant

777 12th Street, 3rd Floor ▪ Sacramento, CA 95814-1908
916/874-4800 ▪ 916/874-4899 fax
www.airquality.org

Also, because of the project's size as an employment center, we recommend the City review the current Transportation Management Plan (TMP) for this project and consider whether it needs to be revised and strengthened, given the larger employee population which will come with the expansion of the Kaiser facility. In particular, we believe membership in a local Transportation Management Association should be a requirement of the Plan If there is no TMP for the project, we recommend that one be created and implemented. This requirement is per the City's own TSM Program found in the City's zoning code (17.184) which requires that major projects be required to obtain a TMP permit, subject to approval by the Planning Director and the Traffic Engineer. The purpose of the TMP is to reduce trips by 35% in order to reduce traffic congestion, optimize the use of the transportation system, and improve air quality. We recommend the creation or updating of the TMP be a condition of approval of the project if the current plan is found to be inadequate. We would be interested in also reviewing that TMP to ensure consistency between the TMP and the Air Quality Mitigation Plan

All projects are subject to SMAQMD rules and regulations in effect at the time of construction Please see the attached document describing SMAQMD Rules which may apply to this project.

We look forward to reviewing the environmental document for the project. If you have questions or comments, I can be reached at jborkenhagen@airquality.org or by phone at 874-4885.

Sincerely,

Jeane Borkenhagen

Jeane Borkenhagen, Associate Air Quality Planner Analyst

cc	Ron Maertz	SMAQMD
	Ed Cox	City of Sacramento
	Ms Anita Williams	Lionakis Beaumont Design Group, Inc

Enc: SMAQMD Rules & Regulations Statement

SMAQMD Rules & Regulations Statement

The following statement is recommended as standard condition of approval or construction document language for ***all*** *construction projects within the Sacramento Metropolitan Air Quality Management District (SMAQMD).*

All projects are subject to SMAQMD rules and regulations in effect at the time of construction. A complete listing of current rules is available at www.airquality.org or by calling 916.874.4800. Specific rules that may relate to construction activities may include, but are not limited to:

Rule 201: General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permit(s) from SMAQMD prior to equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact the District early to determine if a permit is required, and to begin the permit application process. Portable construction equipment (e.g. generators, compressors, pile drivers, lighting equipment, etc) with an internal combustion engine over 50 horsepower are required to have a SMAQMD permit or a California Air Resources Board portable equipment registration

Rule 403: Fugitive Dust. The developer or contractor is required to control dust emissions from earth moving activities or any other construction activity to prevent airborne dust from leaving the project site.

Rule 442: Architectural Coatings. The developer or contractor is required to use coatings that comply with the volatile organic compound content limits specified in the rule.

Rule 902: Asbestos. The developer or contractor is required to notify SMAQMD of any regulated renovation or demolition activity. Rule 902 contains specific requirements for surveying, notification, removal, and disposal of asbestos containing material.

Other general types of uses that require a permit include dry cleaners, gasoline stations, spray booths, and operations that generate airborne particulate emissions.

California Regional Water Quality Control Board
Central Valley Region
Robert Schneider, Chair

Alan C. Lloyd, Ph.D.
Agency Secretary

Sacramento Main Office
11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Phone (916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

Arnold Schwarzenegger
Governor

28 November 2005

Dana Allen
City of Sacramento
1231 I Street, Room 300
Sacramento, CA 95814

PROPOSED PROJECT REVIEW, CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA), NOTICE OF PREPARATION FOR KAISER PERMANENTE SOUTH SACRAMENTO MEDICAL CENTER EXPANSION, STATE CLEARINGHOUSE #2005102127, SACRAMENTO, SACRAMENTO COUNTY

As a Responsible Agency, as defined by CEQA, we have reviewed the Notice of Preparation for Kaiser Permanente South Sacramento Medical Center Expansion. Based on our review, we have the following comments regarding the proposed project.

Construction Storm Water

A NPDES General Permit for Storm Water Discharges Associated with Construction Activities, NPDES No. CAS000002, Order No. 99-08-DWQ is required when a site involves clearing, grading, disturbances to the ground, such as stockpiling, or excavation that results in soil disturbances of one acre or more of total land area. Construction activity that involves soil disturbances on construction sites of less than one acres and is part of a larger common plan of development or sale, also requires permit coverage. Coverage under the General Permit must be obtained prior to construction. More information may be found at http://www.swrcb.ca.gov/stormwtr/construction.html

Post-Construction Storm Water Management

Manage storm water to retain the natural flow regime and water quality, including not altering baseline flows in receiving waters, not allowing untreated discharges to occur into existing aquatic resources, not using aquatic resources for detention or transport of flows above current hydrology, duration, and frequency. All storm water flows generated on-site during and after construction and entering surface waters should be pre-treated to reduce oil, sediment, and other contaminants. The local municipality where the proposed project is located may now require post construction storm water Best Management Practices (BMPs) pursuant to the Phase II, SWRCB, Water Quality Order No 2003 – 0005 – DWQ, NPDES General Permit No. CAS000004, WDRS for Storm Water Discharges from Small Municipal Separate Storm Sewers Systems (MS4). The local municipality may require long-term post-construction BMPs to be incorporated into development and significant redevelopment projects to protect water quality and control runoff flow.

Wetlands and/or stream course alteration

Section 401 of the federal Clean Water Act requires any project that impacts waters of the United States (such as streams and wetlands) to file a 401 Water Quality Certification application with this office. The project proponent must certify the project will not violate state water quality standards. Projects include, but are not limited to, stream crossings, modification of stream banks or stream courses, and the filling or modification of wetlands. If a U S. Army Corp of Engineers (ACOE) permit is required for the project, then Water Quality Certification must be obtained prior to initiation of project activities. The proponent must follow the ACOE 404(b)(1) Guidance to assure approval of their 401 Water Quality Certification application. The guidelines are as follows:

1. **Avoidance** (Is the project the least environmentally damaging *practicable* alternative?)
2. **Minimization** (Does the project minimize any adverse effects to the impacted wetlands?)
3. **Mitigation** (Does the project mitigate to assure a no net loss of functional values?)

If, after avoidance and minimization guidelines are considered and wetland impacts are still anticipated:

- determine functional losses and gains (both permanent and temporal; both direct and indirect)
- conduct adequate baselines of wetland functions including vegetation, wildlife, hydrology, soils, and water quality
- attempt to create/restore the same wetland type that is impacted, in the same watershed
- work with a regional context to maximize benefits for native fish, wildlife, vegetation, as well as for water quality, and hydrology
- use native species and materials whenever possible
- document all efforts made to avoid the minimize adverse wetland impacts
- be prepared to develop performance criteria and to track those for between 5 to 20 years
- be prepared to show project success based on achieving wetland functions
- if the project fails, be prepared to repeat the same process (via financial assurance), with additional acreage added for temporal losses
- specify how the mitigation project will be maintained in perpetuity and who will be responsible for the maintenance

For more information regarding Water Quality Certification may be found at http://www.waterboards.ca.gov/centralvalley/available_documents/wq_cert/application.pdf

CSD-1
COUNTY SANITATION DISTRICT 1
Wastewater Conveyance For a Growing Sacramento

10545 Armstrong Avenue
Mather
California
95655
Tele: [916] 876-6000
Fax: [916] 876-6160
www.csd-1.com

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Marcia Maurer
Chief Financial Officer
Wendell H. Kido
District Manager
Mary K. Snyder
Collection Systems Manager

November 29, 2005
E225.000

Dana Allen
City of Sacramento
Development Services Department
2101 Arena Blvd. 2nd Floor
Sacramento, CA 95834

Subject: **Notice of Preparation (NOP) for a Draft Environmental Impact Report (DEIR) for the Kaiser Permanente South Sacramento Medical Center Expansion**
Control No. P04-185

Dear Ms. Allen:

County Sanitation District 1 (CSD-1) and Sacramento Regional County Sanitation District (SRCSD) have reviewed the Notice of Preparation (NOP) for the Draft Environmental Impact Report (EIR) for the subject project.

The subject property is within the boundaries of CSD-1, SRCSD, and the Urban Service Boundaries (USB) as defined by the CSD-1 Master Plan. The ultimate plan for conveyance and treatment of the subject property shall be by the Districts as specified in their General Plans.

We expect that if the project is subject to currently established policies, ordinances, fees, and to conditions of approval, then mitigation measures within the EIR will adequately address the sewage aspects of the project. We anticipate a less than significant impact to the sewage facilities due to mitigation.

If you have any questions regarding these comments, please call Stephen Moore at (916) 876-6296 or myself at (916) 876-6094.

Sincerely,

Wendy Haggard

Wendy Haggard, P.E.
Department of Water Quality
Development Services

WH: cc

cc: Melenie Spahn
Amber Schalansky

allen112905.ltr.doc

Regional Transit

Sacramento Regional Transit District
A Public Transit Agency and Equal Opportunity Employer

Mailing Address:
P.O. Box 2110
Sacramento, CA 95812-2110

Administrative Office:
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Sacramento, CA 95816
(916) 321-2800
(29th St. Light Rail Station/ Bus 36,38,50,67,68)

Light Rail Office:
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Sacramento, CA 95815
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December 7, 2005

Dana Allen
Environmental Project Manager
CITY OF SACRAMENTO
2101 Arena Blvd, Second Floor
Sacramento, CA 95324

NAME OF DEVELOPMENT: Kaiser Permanente South

CONTROL NUMBER: P04-185

Regional Transit (RT) staff would like to provide the following recommendations for the Draft Environmental Impact Report for the Kaiser Permanente South Sacramento Medical Center Exapnsion:

- A discussion of transit needs to be included in the Draft Environmental Impact Report.

- Applicant needs to explore options and opportunities to enhance connections with public transportation. Among the options, a private shuttle service to/from transit facilities should be explored. Please work with Greta Vohlers, RT Service Planning (916) 556-0510 or gvohlers@sacrt.com.

Thank you for the opportunity to review this project. If you have further questions regarding these recommendations, please contact me at (916) 556-0506 or dsmith@sacrt.com.

Sincerely,

Don Smith
Senior Planner

c: Taiwo Jaiyeoba, Director of Planning, RT
Greta Vohlers, Senior Planner, RT

Appendix B

Air Quality Data

Kaiser South Sacramento Expansion Project
Project Assumptions Sheet
December 2, 2005

Construction Phase

<u>Phase I & 2- April 2006 – June 2007 (18 months)</u>

Demolition :

No Required.

Site Grading:

Duration –3 months
Total Acres – 1 acre
Soil Hauling (cubic yards) – None required. Balanced site.

<u>Equipment Exhaust:</u>

1	Grader	8 hour operation
2	Off-Highway Trucks	8 hour operation
1	Scraper	8 hour operation

Building:

Duration – 15 months

<u>Equipment Exhaust:</u>

2	Off-Highway Trucks	8 hour operation
1	Crane	8 hour operation
(only 1 week)		
1	Other Equipment	8 hour operation
1	Excavator	8 hour operation

Building Sub-phases:

- Asphalt

Acres To Be Paved – 1 acres
Duration – 1 month

<u>Equipment Exhaust:</u>

1	Pavers	8 hour operation
1	Paving Equipment	8 hour operation
1	Other Equipment	8 hour operation

Phase 3 –Sept. 2007 – Dec. 2009 (27 months)

Demolition :

No Required.

Site Grading:

Duration – 3 months
Total Acres – 1 acre
Soil Hauling (cubic yards) – None required. Balanced site.

Equipment Exhaust:

1	Grader	8 hour operation
2	Off-Highway Trucks	8 hour operation
1	Tractor	8 hour operation
1	Scraper	8 hour operation
1	Cranes (6 weeks)	
1	forklift	8 hours operation

Building:

Duration – 21 months

Equipment Exhaust:

2	Off-Highway Trucks	8 hour operation
2	Crane	8 hour operation
1	Other Equipment	8 hour operation
1	Trencher/Loaders/Backhoes	8 hour operation

Building Sub-phases:

- Asphalt

Acres To Be Paved – 0.5 acres
Duration – 1 month

Equipment Exhaust:

1	Pavers	8 hour operation
1	Paving Equipment	8 hour operation
1	Other Equipment	8 hour operation
1	Roller	8 hour operation

Phase 4 – Feb 2010- Dec 2011 (24 months)

Demolition :

None Required.

Site Grading:

None required.

Building:

Duration – 24 months

Equipment Exhaust:

1	Other Equipment	8 hour operation
2	dump truck	8 hour operation

Operational Phase

Vehicle Fleet %:

(Default all phases)

Year:

2025

Trip Characteristics:

(Default all phases)

Temperature Data:

40 to 85 degrees Fahrenheit

Variable Starts:

(Default all phases)

Road Dust:

Paved – 100%
Unpaved – 0%

Pass By Trips:

Off

Double-Counting:

Off

Operational Mitigation Measures:

Refer to URBEMIS 2002 file output.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase InII.urb
Project Name: Phase I & II
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	12.69	80.68	107.58	0.00	13.42	3.42	10.00
TOTALS (lbs/day, mitigated)	12.69	80.68	107.58	0.00	4.91	3.42	1.49

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	12.75	87.14	100.20	0.00	3.68	3.59	0.09
TOTALS (lbs/day, mitigated)	12.75	87.14	100.20	0.00	3.68	3.59	0.09

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser South - Operational.urb
Project Name: South Sacramento Kaiser Hospital Expansion
Project Location: Lower Sacramento Valley Air Basin
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)	3.79	1.64	2.93	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	33.00	41.59	409.25	0.28	48.99

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	36.79	43.23	412.18	0.28	49.00

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser South - Operational.urb
Project Name: South Sacramento Kaiser Hospital Expansion
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.54	1.63	1.37	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	38.98	62.31	474.55	0.28	48.99

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	42.52	63.94	475.92	0.28	48.99

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser South - Operational.urb
Project Name: South Sacramento Kaiser Hospital Expansion
Project Location: Lower Sacramento Valley Air Basin
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)	0.50	0.30	0.39	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	6.39	8.85	78.66	0.05	8.94

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	6.88	9.15	79.05	0.05	8.94

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser South - Operational.urb
Project Name: South Sacramento Kaiser Hospital Expansion
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

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

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.12	1.63	1.37	0	0.00
Hearth	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	3.42	-	-	-	-
TOTALS(lbs/day,unmitigated)	3.54	1.63	1.37	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Medical office building	17.22	27.20	208.47	0.12	21.24
Hospital	21.75	35.11	266.09	0.16	27.75
TOTAL EMISSIONS (lbs/day)	38.98	62.31	474.55	0.28	48.99

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

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 40   Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Medical office building		34.29 trips/1000 sq. ft.	86.30	2,959.23
Hospital		21.74 trips/1000 sq. ft.	158.00	3,434.92

Sum of Total Trips 6,394.15
Total Vehicle Miles Traveled 32,291.05

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
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	0.90	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	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.7	3.8	4.6	7.8	4.5	4.5
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	27.3	21.2	51.5			
% of Trips - Commercial (by land use)						
Medical office building				7.0	3.5	89.5
Hospital				25.0	12.5	62.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The hearth option switch changed from on to off.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser South - Operational.urb
Project Name: South Sacramento Kaiser Hospital Expansion
Project Location: Lower Sacramento Valley Air Basin
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	0.12	1.63	1.37	0	0.00
Hearth - No summer emissions					
Landscaping	0.25	0.01	1.56	0.00	0.01
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	3.42	-	-	-	-
TOTALS(lbs/day,unmitigated)	3.79	1.64	2.93	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Medical office building	14.20	18.19	176.51	0.12	21.24
Hospital	18.80	23.40	232.74	0.16	27.75
TOTAL EMISSIONS (lbs/day)	33.00	41.59	409.25	0.28	48.99

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

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 85   Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Medical office building		34.29 trips/1000 sq. ft.	86.30	2,959.23
Hospital		21.74 trips/1000 sq. ft.	158.00	3,434.92

Sum of Total Trips 6,394.15
Total Vehicle Miles Traveled 32,291.05

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
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	0.90	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	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.7	3.8	4.6	7.8	4.5	4.5
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	27.3	21.2	51.5			
% of Trips - Commercial (by land use)						
Medical office building				7.0	3.5	89.5
Hospital				25.0	12.5	62.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The hearth option switch changed from on to off.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser South - Operational.urb
Project Name: South Sacramento Kaiser Hospital Expansion
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES (Tons per Year, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.02	0.30	0.25	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00
Landscaping	0.02	0.00	0.14	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.45	-	-	-	-
TOTALS (tpy, unmitigated)	0.50	0.30	0.39	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Medical office building	2.78	3.87	34.16	0.02	3.88
Hospital	3.61	4.98	44.50	0.03	5.06
TOTAL EMISSIONS (tons/yr)	6.39	8.85	78.66	0.05	8.94

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

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Medical office building		34.29 trips/1000 sq. ft.	86.30	2,959.23
Hospital		21.74 trips/1000 sq. ft.	158.00	3,434.92

Sum of Total Trips 6,394.15
Total Vehicle Miles Traveled 32,291.05

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
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	0.90	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	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.7	3.8	4.6	7.8	4.5	4.5
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	27.3	21.2	51.5			
% of Trips - Commercial (by land use)						
Medical office building				7.0	3.5	89.5
Hospital				25.0	12.5	62.5

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

The hearth option switch changed from on to off.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2010.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase InII.urb
Project Name: Phase I & II
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	12.69	80.68	107.58	0.00	13.42	3.42	10.00
TOTALS (lbs/day, mitigated)	12.69	80.68	107.58	0.00	4.91	3.42	1.49

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	12.75	87.14	100.20	0.00	3.68	3.59	0.09
TOTALS (lbs/day, mitigated)	12.75	87.14	100.20	0.00	3.68	3.59	0.09

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase InII.urb
Project Name: Phase I & II
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	1.24	8.38	9.93	0.00	0.70	0.36	0.34
TOTALS (tpy, mitigated)	1.24	8.38	9.93	0.00	0.42	0.36	0.06

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	0.50	3.39	4.02	0.00	0.14	0.13	0.01
TOTALS (tpy, mitigated)	0.50	3.39	4.02	0.00	0.14	0.13	0.01

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase InII.urb
Project Name: Phase I & II
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: January, 2006
Construction Duration: 18
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 1 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	10.00	-	10.00
Off-Road Diesel	12.60	80.51	105.79	-	3.42	3.42	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.09	0.17	1.79	0.00	0.00	0.00	0.00
Maximum lbs/day	12.69	80.68	107.58	0.00	13.42	3.42	10.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	7.64	57.32	57.03	-	2.49	2.49	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	8.32	57.73	65.56	0.00	2.59	2.50	0.09
Max lbs/day all phases	12.69	80.68	107.58	0.00	13.42	3.42	10.00
*** 2007***							
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	7.64	54.89	58.65	-	2.26	2.26	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	0.03	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.48	31.90	34.70	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.00	0.08	0.02	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.02	0.01	0.26	0.00	0.00	0.00	0.00
Maximum lbs/day	12.75	87.14	100.20	0.00	3.68	3.59	0.09
Max lbs/day all phases	12.75	87.14	100.20	0.00	3.68	3.59	0.09

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 15 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 14 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Cranes	190	0.430	0.3
1	Excavators	180	0.580	8.0
2	Off Highway Tractors	255	0.410	8.0
1	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '07
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 0.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	1.49	-	1.49
Off-Road Diesel	12.60	80.51	105.79	-	3.42	3.42	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.09	0.17	1.79	0.00	0.00	0.00	0.00
Maximum lbs/day	12.69	80.68	107.58	0.00	4.91	3.42	1.49
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	7.64	57.32	57.03	-	2.49	2.49	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	8.32	57.73	65.56	0.00	2.59	2.50	0.09
Max lbs/day all phases	12.69	80.68	107.58	0.00	4.91	3.42	1.49
*** 2007***							
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	7.64	54.89	58.65	-	2.26	2.26	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	0.03	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.48	31.90	34.70	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.00	0.08	0.02	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.02	0.01	0.26	0.00	0.00	0.00	0.00
Maximum lbs/day	12.75	87.14	100.20	0.00	3.68	3.59	0.09
Max lbs/day all phases	12.75	87.14	100.20	0.00	3.68	3.59	0.09

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 15 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 14 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Cranes	190	0.430	0.3
1	Excavators	180	0.580	8.0
2	Off Highway Tractors	255	0.410	8.0
1	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '07
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 0.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
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.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase InII.urb
Project Name: Phase I & II
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: January, 2006
Construction Duration: 18
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 1 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	10.00	-	10.00
Off-Road Diesel	12.60	80.51	105.79	-	3.42	3.42	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.09	0.17	1.79	0.00	0.00	0.00	0.00
Maximum lbs/day	12.69	80.68	107.58	0.00	13.42	3.42	10.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	7.64	57.32	57.03	-	2.49	2.49	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	8.32	57.73	65.56	0.00	2.59	2.50	0.09
Max lbs/day all phases	12.69	80.68	107.58	0.00	13.42	3.42	10.00
*** 2007***							
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	7.64	54.89	58.65	-	2.26	2.26	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	0.03	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.48	31.90	34.70	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.00	0.08	0.02	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.02	0.01	0.26	0.00	0.00	0.00	0.00
Maximum lbs/day	12.75	87.14	100.20	0.00	3.68	3.59	0.09
Max lbs/day all phases	12.75	87.14	100.20	0.00	3.68	3.59	0.09

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 15 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 14 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Cranes	190	0.430	0.3
1	Excavators	180	0.580	8.0
2	Off Highway Tractors	255	0.410	8.0
1	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '07
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 0.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	1.49	-	1.49
Off-Road Diesel	12.60	80.51	105.79	-	3.42	3.42	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.09	0.17	1.79	0.00	0.00	0.00	0.00
Maximum lbs/day	12.69	80.68	107.58	0.00	4.91	3.42	1.49
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	7.64	57.32	57.03	-	2.49	2.49	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	8.32	57.73	65.56	0.00	2.59	2.50	0.09
Max lbs/day all phases	12.69	80.68	107.58	0.00	4.91	3.42	1.49
*** 2007***							
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	7.64	54.89	58.65	-	2.26	2.26	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	0.03	-	-	-	-	-	-
Asphalt Off-Road Diesel	4.48	31.90	34.70	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.00	0.08	0.02	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.02	0.01	0.26	0.00	0.00	0.00	0.00
Maximum lbs/day	12.75	87.14	100.20	0.00	3.68	3.59	0.09
Max lbs/day all phases	12.75	87.14	100.20	0.00	3.68	3.59	0.09

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 15 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 14 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Cranes	190	0.430	0.3
1	Excavators	180	0.580	8.0
2	Off Highway Tractors	255	0.410	8.0
1	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '07
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 0.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
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.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase InII.urb
Project Name: Phase I & II
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Tons/Year)

Construction Start Month and Year: January, 2006
Construction Duration: 18
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 1 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.33	-	0.33
Off-Road Diesel	0.42	2.66	3.49	-	0.11	0.11	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.01	0.05	0.00	0.00	0.00	0.00
Total tons/year	0.42	2.67	3.54	0.00	0.44	0.11	0.33
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.76	5.68	5.65	-	0.25	0.25	0.00
Bldg Const Worker Trips	0.06	0.03	0.74	0.00	0.01	0.00	0.01
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
Total tons/year	0.82	5.71	6.39	0.00	0.26	0.25	0.01
Total all phases tons/yr	1.24	8.38	9.93	0.00	0.70	0.36	0.34
*** 2007***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.42	3.02	3.23	-	0.12	0.12	0.00
Bldg Const Worker Trips	0.03	0.02	0.41	0.00	0.01	0.00	0.01
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	0.05	0.35	0.38	-	0.01	0.01	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
Total tons/year	0.50	3.39	4.02	0.00	0.14	0.13	0.01
Total all phases tons/yr	0.50	3.39	4.02	0.00	0.14	0.13	0.01

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 15 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 14 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Cranes	190	0.430	0.3
1	Excavators	180	0.580	8.0
2	Off Highway Tractors	255	0.410	8.0
1	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '07
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 0.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.05	-	0.05
Off-Road Diesel	0.42	2.66	3.49	-	0.11	0.11	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.01	0.05	0.00	0.00	0.00	0.00
Total tons/year	0.42	2.67	3.54	0.00	0.16	0.11	0.05
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.76	5.68	5.65	-	0.25	0.25	0.00
Bldg Const Worker Trips	0.06	0.03	0.74	0.00	0.01	0.00	0.01
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
Total tons/year	0.82	5.71	6.39	0.00	0.26	0.25	0.01
Total all phases tons/yr	1.24	8.38	9.93	0.00	0.42	0.36	0.06
*** 2007***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.42	3.02	3.23	-	0.12	0.12	0.00
Bldg Const Worker Trips	0.03	0.02	0.41	0.00	0.01	0.00	0.01
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	0.05	0.35	0.38	-	0.01	0.01	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
Total tons/year	0.50	3.39	4.02	0.00	0.14	0.13	0.01
Total all phases tons/yr	0.50	3.39	4.02	0.00	0.14	0.13	0.01

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 15 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 14 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Cranes	190	0.430	0.3
1	Excavators	180	0.580	8.0
2	Off Highway Tractors	255	0.410	8.0
1	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '07
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 0.25
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
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.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase III.urb
Project Name: Phase III
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	14.56	95.45	121.06	0.00	34.11	4.10	30.01
TOTALS (lbs/day, mitigated)	14.56	95.45	121.06	0.00	8.59	4.10	4.49

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	10.64	65.84	90.14	0.00	2.70	2.61	0.09
TOTALS (lbs/day, mitigated)	10.64	65.84	90.14	0.00	2.70	2.61	0.09

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	10.59	64.01	90.33	0.00	2.47	2.38	0.09
TOTALS (lbs/day, mitigated)	10.59	64.01	90.33	0.00	2.47	2.38	0.09

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase III.urb
Project Name: Phase III
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	14.56	95.45	121.06	0.00	34.11	4.10	30.01
TOTALS (lbs/day, mitigated)	14.56	95.45	121.06	0.00	8.59	4.10	4.49

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	10.64	65.84	90.14	0.00	2.70	2.61	0.09
TOTALS (lbs/day, mitigated)	10.64	65.84	90.14	0.00	2.70	2.61	0.09

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	10.59	64.01	90.33	0.00	2.47	2.38	0.09
TOTALS (lbs/day, mitigated)	10.59	64.01	90.33	0.00	2.47	2.38	0.09

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase III.urb
Project Name: Phase III
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	1.53	9.84	12.78	0.00	1.43	0.43	1.00
TOTALS (tpy, mitigated)	1.53	9.84	12.78	0.00	0.59	0.43	0.16

*** 2007 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	1.40	8.68	11.80	0.00	0.35	0.34	0.01
TOTALS (tpy, mitigated)	1.40	8.68	11.80	0.00	0.35	0.34	0.01

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	0.29	1.80	2.45	0.00	0.06	0.06	0.00
TOTALS (tpy, mitigated)	0.29	1.80	2.45	0.00	0.06	0.06	0.00

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase III.urb
Project Name: Phase III
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: January, 2006
Construction Duration: 27
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 3 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	30.00	-	30.00
Off-Road Diesel	14.45	95.25	118.91	-	4.10	4.10	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.11	0.20	2.15	0.00	0.01	0.00	0.01
Maximum lbs/day	14.56	95.45	121.06	0.00	34.11	4.10	30.01
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.01	67.27	81.36	-	2.90	2.90	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	10.69	67.68	89.89	0.00	3.00	2.91	0.09
Max lbs/day all phases	14.56	95.45	121.06	0.00	34.11	4.10	30.01
*** 2007***							
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	10.01	65.46	82.12	-	2.60	2.60	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	10.64	65.84	90.14	0.00	2.70	2.61	0.09
Max lbs/day all phases	10.64	65.84	90.14	0.00	2.70	2.61	0.09

*** 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	10.01	63.65	82.86	-	2.37	2.37	0.00
Bldg Const Worker Trips	0.57	0.35	7.47	0.00	0.10	0.01	0.09
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	0.12	-	-	-	-	-	-
Asphalt Off-Road Diesel	5.35	35.57	42.88	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.02	0.34	0.06	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.03	0.02	0.36	0.00	0.00	0.00	0.00
Maximum lbs/day	10.59	64.01	90.33	0.00	2.47	2.38	0.09
Max lbs/day all phases	10.59	64.01	90.33	0.00	2.47	2.38	0.09

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 23 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Cranes	190	0.430	0.3
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: Mar '08
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	4.48	-	4.48

Off-Road Diesel	14.45	95.25	118.91	-	4.10	4.10	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.11	0.20	2.15	0.00	0.01	0.00	0.01
Maximum lbs/day	14.56	95.45	121.06	0.00	8.59	4.10	4.49
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.01	67.27	81.36	-	2.90	2.90	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	10.69	67.68	89.89	0.00	3.00	2.91	0.09
Max lbs/day all phases	14.56	95.45	121.06	0.00	8.59	4.10	4.49

*** 2007***

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	10.01	65.46	82.12	-	2.60	2.60	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	10.64	65.84	90.14	0.00	2.70	2.61	0.09
Max lbs/day all phases	10.64	65.84	90.14	0.00	2.70	2.61	0.09

*** 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	10.01	63.65	82.86	-	2.37	2.37	0.00
Bldg Const Worker Trips	0.57	0.35	7.47	0.00	0.10	0.01	0.09
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	0.12	-	-	-	-	-	-
Asphalt Off-Road Diesel	5.35	35.57	42.88	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.02	0.34	0.06	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.03	0.02	0.36	0.00	0.00	0.00	0.00
Maximum lbs/day	10.59	64.01	90.33	0.00	2.47	2.38	0.09
Max lbs/day all phases	10.59	64.01	90.33	0.00	2.47	2.38	0.09

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 23 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Cranes	190	0.430	0.3
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: Mar '08
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
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.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase III.urb
Project Name: Phase III
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: January, 2006
Construction Duration: 27
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 3 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	30.00	-	30.00
Off-Road Diesel	14.45	95.25	118.91	-	4.10	4.10	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.11	0.20	2.15	0.00	0.01	0.00	0.01
Maximum lbs/day	14.56	95.45	121.06	0.00	34.11	4.10	30.01
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.01	67.27	81.36	-	2.90	2.90	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	10.69	67.68	89.89	0.00	3.00	2.91	0.09
Max lbs/day all phases	14.56	95.45	121.06	0.00	34.11	4.10	30.01
*** 2007***							
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	10.01	65.46	82.12	-	2.60	2.60	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	10.64	65.84	90.14	0.00	2.70	2.61	0.09
Max lbs/day all phases	10.64	65.84	90.14	0.00	2.70	2.61	0.09

*** 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	10.01	63.65	82.86	-	2.37	2.37	0.00
Bldg Const Worker Trips	0.57	0.35	7.47	0.00	0.10	0.01	0.09
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	0.12	-	-	-	-	-	-
Asphalt Off-Road Diesel	5.35	35.57	42.88	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.02	0.34	0.06	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.03	0.02	0.36	0.00	0.00	0.00	0.00
Maximum lbs/day	10.59	64.01	90.33	0.00	2.47	2.38	0.09
Max lbs/day all phases	10.59	64.01	90.33	0.00	2.47	2.38	0.09

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 23 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Cranes	190	0.430	0.3
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: Mar '08
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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	-	-	-	-	4.48	-	4.48

Off-Road Diesel	14.45	95.25	118.91	-	4.10	4.10	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.11	0.20	2.15	0.00	0.01	0.00	0.01
Maximum lbs/day	14.56	95.45	121.06	0.00	8.59	4.10	4.49
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.01	67.27	81.36	-	2.90	2.90	0.00
Bldg Const Worker Trips	0.67	0.40	8.53	0.00	0.10	0.01	0.09
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	10.69	67.68	89.89	0.00	3.00	2.91	0.09
Max lbs/day all phases	14.56	95.45	121.06	0.00	8.59	4.10	4.49

*** 2007***

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	10.01	65.46	82.12	-	2.60	2.60	0.00
Bldg Const Worker Trips	0.62	0.38	8.02	0.00	0.10	0.01	0.09
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	10.64	65.84	90.14	0.00	2.70	2.61	0.09
Max lbs/day all phases	10.64	65.84	90.14	0.00	2.70	2.61	0.09

*** 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	10.01	63.65	82.86	-	2.37	2.37	0.00
Bldg Const Worker Trips	0.57	0.35	7.47	0.00	0.10	0.01	0.09
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	0.12	-	-	-	-	-	-
Asphalt Off-Road Diesel	5.35	35.57	42.88	-	1.32	1.32	0.00
Asphalt On-Road Diesel	0.02	0.34	0.06	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.03	0.02	0.36	0.00	0.00	0.00	0.00
Maximum lbs/day	10.59	64.01	90.33	0.00	2.47	2.38	0.09
Max lbs/day all phases	10.59	64.01	90.33	0.00	2.47	2.38	0.09

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 23 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Cranes	190	0.430	0.3
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: Mar '08
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
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.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase III.urb
Project Name: Phase III
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Tons/Year)

Construction Start Month and Year: January, 2006
Construction Duration: 27
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 3 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.99	-	0.99
Off-Road Diesel	0.48	3.14	3.92	-	0.14	0.14	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.01	0.07	0.00	0.00	0.00	0.00
Total tons/year	0.48	3.15	3.99	0.00	1.13	0.14	0.99
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.99	6.66	8.05	-	0.29	0.29	0.00
Bldg Const Worker Trips	0.06	0.03	0.74	0.00	0.01	0.00	0.01
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
Total tons/year	1.05	6.69	8.79	0.00	0.30	0.29	0.01
Total all phases tons/yr	1.53	9.84	12.78	0.00	1.43	0.43	1.00
*** 2007***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.32	8.64	10.84	-	0.34	0.34	0.00
Bldg Const Worker Trips	0.08	0.04	0.96	0.00	0.01	0.00	0.01
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
Total tons/year	1.40	8.68	11.80	0.00	0.35	0.34	0.01
Total all phases tons/yr	1.40	8.68	11.80	0.00	0.35	0.34	0.01

*** 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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.22	1.40	1.82	-	0.05	0.05	0.00
Bldg Const Worker Trips	0.01	0.01	0.16	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	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.06	0.39	0.47	-	0.01	0.01	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
Total tons/year	0.29	1.80	2.45	0.00	0.06	0.06	0.00
Total all phases tons/yr	0.29	1.80	2.45	0.00	0.06	0.06	0.00

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 23 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Cranes	190	0.430	0.3
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: Mar '08
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2006***							
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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.15	-	0.15

Off-Road Diesel	0.48	3.14	3.92	-	0.14	0.14	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.01	0.07	0.00	0.00	0.00	0.00
Total tons/year	0.48	3.15	3.99	0.00	0.29	0.14	0.15
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.99	6.66	8.05	-	0.29	0.29	0.00
Bldg Const Worker Trips	0.06	0.03	0.74	0.00	0.01	0.00	0.01
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
Total tons/year	1.05	6.69	8.79	0.00	0.30	0.29	0.01
Total all phases tons/yr	1.53	9.84	12.78	0.00	0.59	0.43	0.16

*** 2007***

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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.32	8.64	10.84	-	0.34	0.34	0.00
Bldg Const Worker Trips	0.08	0.04	0.96	0.00	0.01	0.00	0.01
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
Total tons/year	1.40	8.68	11.80	0.00	0.35	0.34	0.01
Total all phases tons/yr	1.40	8.68	11.80	0.00	0.35	0.34	0.01

*** 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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.22	1.40	1.82	-	0.05	0.05	0.00
Bldg Const Worker Trips	0.01	0.01	0.16	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	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.06	0.39	0.47	-	0.01	0.01	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
Total tons/year	0.29	1.80	2.45	0.00	0.06	0.06	0.00
Total all phases tons/yr	0.29	1.80	2.45	0.00	0.06	0.06	0.00

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '06
Phase 2 Duration: 3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Scrapers	313	0.660	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Apr '06
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Apr '06
SubPhase Building Duration: 23 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Cranes	190	0.430	0.3
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: Mar '08
SubPhase Asphalt Duration: 1 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
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.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase IV.urb
Project Name: Phase IV
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09
TOTALS (lbs/day, mitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09

*** 2011 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09
TOTALS (lbs/day, mitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase IV.urb
Project Name: Phase IV
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09
TOTALS (lbs/day, mitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09

*** 2011 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09
TOTALS (lbs/day, mitigated)	11.18	61.83	110.27	0.02	2.01	1.92	0.09

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase IV.urb
Project Name: Phase IV
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

CONSTRUCTION EMISSION ESTIMATES

*** 2010 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	1.47	8.15	14.41	0.00	0.27	0.26	0.01
TOTALS (tpy, mitigated)	1.47	8.15	14.41	0.00	0.27	0.26	0.01

*** 2011 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	1.47	8.15	14.48	0.00	0.27	0.26	0.01
TOTALS (tpy, mitigated)	1.47	8.15	14.48	0.00	0.27	0.26	0.01

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase IV.urb
Project Name: Phase IV
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: January, 2010
Construction Duration: 24
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 0 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2010***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09
*** 2011***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Jan '10
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Jan '10
SubPhase Building Duration: 24 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
SubPhase Asphalt Turned OFF

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2010***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09
*** 2011***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09

Construction-Related Mitigation Measures

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Jan '10
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Jan '10
SubPhase Building Duration: 24 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
SubPhase Asphalt Turned OFF

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase IV.urb
Project Name: Phase IV
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: January, 2010
Construction Duration: 24
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 0 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2010***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09
*** 2011***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Jan '10
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Jan '10
SubPhase Building Duration: 24 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
SubPhase Asphalt Turned OFF

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2010***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09
*** 2011***							
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	9.92	59.49	83.59	-	1.86	1.86	0.00
Bldg Const Worker Trips	1.25	2.34	26.68	0.02	0.15	0.06	0.09
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	11.18	61.83	110.27	0.02	2.01	1.92	0.09
Max lbs/day all phases	11.18	61.83	110.27	0.02	2.01	1.92	0.09

Construction-Related Mitigation Measures

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Jan '10
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Jan '10
SubPhase Building Duration: 24 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
SubPhase Asphalt Turned OFF

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths

URBEMIS 2002 For Windows 8.7.0

File Name: H:\COMMON\MC Files\URBEMIS2002v8.7\Kaiser - Phase IV.urb
Project Name: Phase IV
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Tons/Year)

Construction Start Month and Year: January, 2010
Construction Duration: 24
Total Land Use Area to be Developed: 24 acres
Maximum Acreage Disturbed Per Day: 0 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 244300

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2010***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.31	7.85	11.03	-	0.25	0.25	0.00
Bldg Const Worker Trips	0.16	0.30	3.38	0.00	0.02	0.01	0.01
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
Total tons/year	1.47	8.15	14.41	0.00	0.27	0.26	0.01
Total all phases tons/yr	1.47	8.15	14.41	0.00	0.27	0.26	0.01
*** 2011***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.31	7.85	11.03	-	0.25	0.25	0.00
Bldg Const Worker Trips	0.16	0.30	3.45	0.00	0.02	0.01	0.01
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
Total tons/year	1.47	8.15	14.48	0.00	0.27	0.26	0.01
Total all phases tons/yr	1.47	8.15	14.48	0.00	0.27	0.26	0.01

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Jan '10
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Jan '10
SubPhase Building Duration: 24 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
SubPhase Asphalt Turned OFF

CONSTRUCTION EMISSION ESTIMATES MITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2010***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.31	7.85	11.03	-	0.25	0.25	0.00
Bldg Const Worker Trips	0.16	0.30	3.38	0.00	0.02	0.01	0.01
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
Total tons/year	1.47	8.15	14.41	0.00	0.27	0.26	0.01
Total all phases tons/yr	1.47	8.15	14.41	0.00	0.27	0.26	0.01
*** 2011***							
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
Total tons/year	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
Total tons/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.31	7.85	11.03	-	0.25	0.25	0.00
Bldg Const Worker Trips	0.16	0.30	3.45	0.00	0.02	0.01	0.01
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
Total tons/year	1.47	8.15	14.48	0.00	0.27	0.26	0.01
Total all phases tons/yr	1.47	8.15	14.48	0.00	0.27	0.26	0.01

Construction-Related Mitigation Measures

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Jan '10
Phase 3 Duration: 24 months
Start Month/Year for SubPhase Building: Jan '10
SubPhase Building Duration: 24 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Off Highway Trucks	417	0.490	8.0
1	Other Equipment	190	0.620	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

SubPhase Architectural Coatings Turned OFF
SubPhase Asphalt Turned OFF

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 7- Bruceville
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	2.2 PPM		
SIGTH=	10. DEGREES	TEMP=	5.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	-661	-726	-706	-737	AG	0	1.0	.0	10.0
B. Link B	-706	-737	-753	-748	AG	0	2.0	.0	10.0
C. Link C1	-753	-748	-823	-767	AG	259	1.0	.0	10.0
D. Link C2	-823	-767	-874	-766	AG	259	1.0	.0	10.0
E. Link D	-864	-786	-805	-773	AG	426	1.0	.0	10.0
F. Link E	-805	-773	-761	-761	AG	265	2.0	.0	10.0
G. Link F	-761	-761	-660	-735	AG	0	1.0	.0	10.0
H. Link G	-727	-874	-737	-817	AG	839	1.0	.0	10.0
I. Link H	-737	-817	-750	-759	AG	686	2.0	.0	10.0
J. Link I	-750	-759	-779	-659	AG	847	1.0	.0	10.0
K. Link J	-791	-663	-776	-715	AG	596	1.0	.0	10.0
L. Link K	-776	-715	-764	-751	AG	596	2.0	.0	10.0
M. Link L	-764	-751	-732	-877	AG	861	1.0	.0	10.0
N. Link M	-738	-811	-759	-756	AG	153	2.0	.0	10.0
O. Link N	-759	-756	-774	-719	AG	0	2.0	.0	10.0
P. Link O	-802	-772	-759	-756	AG	101	2.0	.0	10.0
Q. Link P	-759	-756	-709	-738	AG	0	2.0	.0	10.0

(LINK COORDINATES (M): X1, Y1, X2, Y2)

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. Recpt 1	-808	-736	.5
2. Recpt 2	-780	-801	.5

(COORDINATES (M): X, Y, Z)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 7- Bruceville
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. Recpt 1	131.	2.3	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	11.	2.3	.0	.0	.0	.0	.0	.0	.0	.0

CONC/LINK (PPM)

RECEPTOR	I	J	K	L	M	N	O	P	Q
1. Recpt 1	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0	.0	.0

Appendix C

Traffic Data

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #1: Valley Hi & Mack

Signal=Protect/Rights=Include
Initial Vol: 14 128 187***
Lanes: 0 1 1 0 2

Westbound side: Signal=Protect, Rights=Include

Initial Vol:	Lanes:	Signal=Protect Rights=Include
19	1	
	0	
840***	2	
	0	
144	1	

Vol Cnt Date:	n/a
Cycle Time (sec):	110
Loss Time (sec):	16
Critical V/C:	0.559
Avg Crit Del (sec/veh):	31.7
Avg Delay (sec/veh):	29.7
LOS:	C

Signal=Protect Rights=Include	Lanes:	Initial Vol:
	0	95
	1	
	1	645
	0	
	2	249***

Lanes: 2 0 1 1 1
Initial Vol: 170 152 610***
Signal=Protect/Rights=Overlap

```
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4   10     0     4    6     0     4   26     0     4   30     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    170  152   610   187  128    14    19  840   144   249  645    95
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 170  152   610   187  128    14    19  840   144   249  645    95
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut: 170  152   610   187  128    14    19  840   144   249  645    95
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  170  152   610   187  128    14    19  840   144   249  645    95
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 170  152   610   187  128    14    19  840   144   249  645    95
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  170  152   610   187  128    14    19  840   144   249  645    95
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.84  0.84  0.92 0.94  0.94  0.95 0.95  0.85  0.92 0.93  0.93
Lanes:       2.00 1.00  2.00  2.00 1.80  0.20  1.00 2.00  1.00  2.00 1.74  0.26
Final Sat.:  3502 1588  3177  3502 3205   351  1805 3610  1615  3502 3087   455
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.10  0.19  0.05 0.04  0.04  0.01 0.23  0.09  0.07 0.21  0.21
Crit Moves:             ****  ****                  ****        ****
Green/Cycle: 0.15 0.22  0.34  0.10 0.16  0.16  0.06 0.42  0.42  0.13 0.48  0.48
Volume/Cap:  0.33 0.44  0.56  0.56 0.24  0.24  0.16 0.56  0.21  0.56 0.44  0.44
Delay/Veh:   42.5 37.6  29.9  49.7 40.2  40.2  49.4 24.9  20.8  46.7 19.0  19.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  42.5 37.6  29.9  49.7 40.2  40.2  49.4 24.9  20.8  46.7 19.0  19.0
HCM2kAvg:      3    5     9     4    2     2     1   11     3     5    8     8
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        2  0  1  1  1    2  0  1  1  0    1  0  2  0  1    2  0  1  1  0
Lane Group:   L    RT    RT    L    RT    RT    L    T     R     L    RT    RT
#LnsInGrps:   2    3     3     2    2     2     1    2     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid       8                8                8                8
% Hev Veh:         0                0                0                0
Grade:            0%               0%               0%               0%
Parking/Hr:       No               No               No               No
Bus Stp/Hr:        0                0                0                0
Area Type:   < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:       0                0                0                0
ExclusiveRT:    Include          Include          Include          Include
% RT Prtct:        0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Bus Stp Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx 0.88  0.88  xxxx 0.99  0.99  xxxx xxxx  0.85  xxxx 0.98  0.98
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 0.88  0.88  0.95 0.99  0.99  0.95 1.00  0.85  0.95 0.98  0.98
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 0.97 0.95  0.95  0.97 0.95  0.95  1.00 0.95  1.00  0.97 0.95  0.95
Fnl Sat Adj: 0.92 0.84  0.84  0.92 0.94  0.94  0.95 0.95  0.85  0.92 0.93  0.93
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < No    > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > >
Street Type:     Main             Main             Side             Side
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                          2000 HCM Operations Method
                          Future Volume Alternative
```


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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.15	0.22	0.34	0.10	0.16	0.16	0.06	0.42	0.42	0.13	0.48	0.48
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	2.5	4.0	7.6	2.9	1.9	1.9	0.6	9.8	2.8	3.8	7.4	7.4
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.5	0.8	1.2	1.1	0.3	0.3	0.2	1.2	0.3	1.2	0.8	0.8
HCM2KQueue:	2.9	4.8	8.8	4.0	2.2	2.2	0.8	11.0	3.1	4.9	8.2	8.2
70th%Factor:	1.19	1.19	1.18	1.19	1.19	1.19	1.20	1.18	1.19	1.19	1.18	1.18
70th%HCM2kQ:	3.5	5.7	10.4	4.8	2.6	2.6	0.9	12.9	3.7	5.9	9.7	9.7
85th%Factor:	1.57	1.56	1.52	1.56	1.58	1.58	1.59	1.51	1.57	1.55	1.53	1.53
85th%HCM2kQ:	4.6	7.5	13.4	6.3	3.5	3.5	1.2	16.6	4.9	7.7	12.5	12.5
90th%Factor:	1.75	1.71	1.66	1.73	1.76	1.76	1.78	1.63	1.74	1.71	1.67	1.67
90th%HCM2kQ:	5.1	8.2	14.6	6.9	3.9	3.9	1.4	17.9	5.4	8.4	13.7	13.7
95th%Factor:	2.01	1.96	1.87	1.98	2.03	2.03	2.07	1.83	2.01	1.96	1.88	1.88
95th%HCM2kQ:	5.9	9.4	16.4	7.9	4.5	4.5	1.6	20.1	6.2	9.6	15.4	15.4
98th%Factor:	2.50	2.39	2.21	2.43	2.54	2.54	2.64	2.13	2.49	2.38	2.23	2.23
98th%HCM2kQ:	7.3	11.5	19.4	9.8	5.6	5.6	2.0	23.4	7.7	11.8	18.3	18.3

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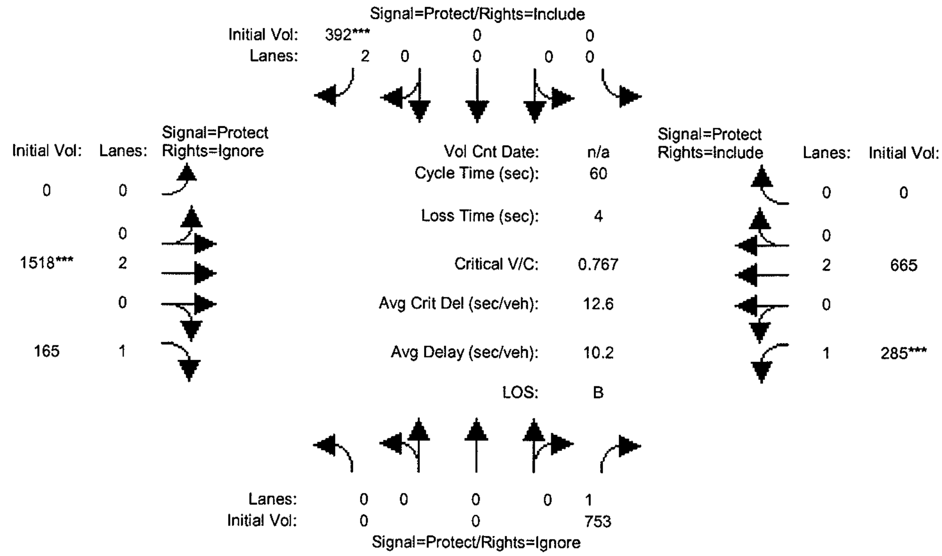
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #2: Alta Valley & Mack



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	753	0	0	392	0	1518	165	285	665	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	753	0	0	392	0	1518	165	285	665	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	753	0	0	392	0	1518	165	285	665	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	392	0	1518	0	285	665	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	392	0	1518	0	285	665	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	392	0	1518	0	285	665	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.42	0.00	0.16	0.18	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.58	0.00	0.79	0.25	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	30.2	0.0	4.1	0.0	33.9	2.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	30.2	0.0	4.1	0.0	33.9	2.3	0.0
HCM2kAvg:	0	0	0	0	0	6	0	7	0	8	2	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		0 0 0 0 1			0 0 0 0 2			0 0 2 0 1			1 0 2 0 0	
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > > >											
Street Type:		Main			Main			Side			Side	
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method

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Future Volume Alternative

Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	3.1	0.0	5.9	0.0	4.8	1.7	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	2.5	0.0	1.3	0.0	2.9	0.3	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	5.6	0.0	7.2	0.0	7.7	2.0	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.19	1.20	1.18	1.20	1.18	1.20	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	6.6	0.0	8.6	0.0	9.1	2.4	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.55	1.60	1.54	1.60	1.53	1.58	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	8.6	0.0	11.1	0.0	11.7	3.2	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.70	1.80	1.68	1.80	1.67	1.76	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	9.5	0.0	12.1	0.0	12.8	3.6	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.94	2.10	1.90	2.10	1.89	2.04	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	10.8	0.0	13.7	0.0	14.5	4.1	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.35	2.70	2.27	2.70	2.25	2.56	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	13.1	0.0	16.4	0.0	17.3	5.2	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Overlap
Initial Vol: 40 365 166***
Lanes: 1 0 2 0 1

Signal=Split Rights=Overlap (West approach)
Initial Vol: Lanes:
60 1
0
36*** 1!
0
9 0

Vol Cnt Date: n/a
Cycle Time (sec): 90
Loss Time (sec): 16
Critical V/C: 0.425
Avg Crit Del (sec/veh): 24.7
Avg Delay (sec/veh): 21.4
LOS: C

Signal=Split Rights=Overlap (East approach)
Lanes: Initial Vol:
2 208
0
0 44***
1
1 74

Lanes: 1 0 2 0 1
Initial Vol: 21 666*** 141
Signal=Protect/Rights=Overlap

```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     4    4     0     6    6     0     0    4     0     0    4     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21  666   141   166  365    40    60   36     9    74   44   208
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21  666   141   166  365    40    60   36     9    74   44   208
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   21  666   141   166  365    40    60   36     9    74   44   208
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21  666   141   166  365    40    60   36     9    74   44   208
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21  666   141   166  365    40    60   36     9    74   44   208
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    21  666   141   166  365    40    60   36     9    74   44   208
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
Lanes:       1.00 2.00  1.00  1.00 2.00  1.00  1.40 0.48  0.12  1.25 0.75  2.00
Final Sat.:  1805 3610  1615  1805 3610  1615  2552  875   219  2312 1374  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.18  0.09  0.09 0.10  0.02  0.02 0.04  0.04  0.03 0.03  0.07
Crit Moves:       ****        ****                  ****              ****
Green/Cycle: 0.20 0.43  0.51  0.22 0.45  0.55  0.10 0.10  0.30  0.08 0.08  0.29
Volume/Cap:  0.06 0.43  0.17  0.43 0.22  0.05  0.24 0.43  0.14  0.43 0.43  0.25
Delay/Veh:   29.3 17.9  12.0  31.2 15.1   9.4  37.9 39.5  23.4  40.8 40.8  24.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  29.3 17.9  12.0  31.2 15.1   9.4  37.9 39.5  23.4  40.8 40.8  24.5
HCM2kAvg:       1    7     2     4    3     1     1    3     2     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         1  0  2  0  1   1  0  2  0  1    1  0  1! 0  0    1  1  0  0  2
Lane Group:     L    T     R     L    T     R   LTR  LTR   LTR    LT   LT     R
#LnsInGrps:     1    2     1     1    2     1     2    1     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:    < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:      Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx  xxxx     1 xxxx  xxxx     4    4     4     4    4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx xxxx  0.85  xxxx xxxx  0.85  0.99 0.99  0.99  xxxx xxxx  0.85
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.97 0.97  0.97  0.97 0.97 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95 1.00  0.85  0.96 0.96  0.96  0.97 0.97  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  1.00  1.00 1.00  1.00  1.00 1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < < <    Actuated     > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
```

Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.20	0.43	0.51	0.22	0.45	0.55	0.10	0.10	0.30	0.08	0.08	0.29
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.4	5.8	1.9	3.8	2.8	0.5	1.0	1.8	1.4	1.5	1.5	2.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	0.7	0.2	0.7	0.3	0.0	0.3	0.7	0.2	0.7	0.7	0.3
HCM2KQueue:	0.5	6.5	2.1	4.5	3.1	0.5	1.3	2.5	1.6	2.1	2.1	2.3
70th%Factor:	1.20	1.18	1.19	1.19	1.19	1.20	1.20	1.19	1.20	1.19	1.19	1.19
70th%HCM2kQ:	0.6	7.7	2.5	5.3	3.7	0.6	1.6	3.0	1.9	2.6	2.6	2.8
85th%Factor:	1.59	1.54	1.58	1.56	1.57	1.59	1.59	1.58	1.58	1.58	1.58	1.58
85th%HCM2kQ:	0.8	10.0	3.3	7.0	4.8	0.8	2.1	4.0	2.5	3.4	3.4	3.7
90th%Factor:	1.79	1.69	1.76	1.72	1.74	1.79	1.77	1.75	1.77	1.76	1.76	1.76
90th%HCM2kQ:	0.9	11.0	3.7	7.7	5.4	0.9	2.4	4.4	2.8	3.8	3.8	4.1
95th%Factor:	2.08	1.92	2.03	1.97	2.01	2.08	2.06	2.02	2.05	2.03	2.03	2.03
95th%HCM2kQ:	1.1	12.5	4.3	8.8	6.2	1.1	2.7	5.1	3.2	4.4	4.4	4.7
98th%Factor:	2.66	2.31	2.55	2.41	2.49	2.66	2.60	2.52	2.59	2.55	2.55	2.54
98th%HCM2kQ:	1.4	15.0	5.4	10.8	7.6	1.4	3.5	6.4	4.1	5.5	5.5	5.9

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 402 80
Lanes: 0 0 2 0 1

West: Initial Vol	Lanes	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes	East: Initial Vol
0	0					1	99
	0		Vol Cnt Date:	n/a		0	
0	0		Cycle Time (sec):	100		0	0
	0		Loss Time (sec):	0		0	
0	0		Critical V/C:	0.000		1	36
			Avg Crit Del (sec/veh):	2.1			
			Avg Delay (sec/veh):	2.1			
			LOS:	C			

Lanes: 0 0 1 1 0
Initial Vol: 0 704 61
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound       South Bound       East Bound        West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  704    61     80  402     0      0    0     0     36    0    99
Growth Adj:  1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
Initial Bse:   0  704    61     80  402     0      0    0     0     36    0    99
Added Vol:     0    0     0      0    0     0      0    0     0      0    0     0
PasserByVol:   0    0     0      0    0     0      0    0     0      0    0     0
Initial Fut:   0  704    61     80  402     0      0    0     0     36    0    99
User Adj:    1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
PHF Volume:    0  704    61     80  402     0      0    0     0     36    0    99
Reduct Vol:    0    0     0      0    0     0      0    0     0      0    0     0
Final Vol.:    0  704    61     80  402     0      0    0     0     36    0    99
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx    4.1 xxxx xxxxx xxxxx xxxx xxxxx    6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx    2.2 xxxx xxxxx xxxxx xxxx xxxxx    3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx    765 xxxx xxxxx  xxxx xxxx xxxxx  1095 xxxx   383
Potent Cap.: xxxx xxxx xxxxx    857 xxxx xxxxx  xxxx xxxx xxxxx   211 xxxx   621
Move Cap.:   xxxx xxxx xxxxx    857 xxxx xxxxx  xxxx xxxx xxxxx   196 xxxx   621
Volume/Cap:  xxxx xxxx  xxxx   0.09 xxxx  xxxx  xxxx xxxx  xxxx  0.18 xxxx  0.16
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx    0.3 xxxx xxxxx xxxxx xxxx xxxxx    0.7 xxxx   0.6
Stopped Del:xxxxx xxxx xxxxx    9.6 xxxx xxxxx xxxxx xxxx xxxxx   27.5 xxxx  11.9
LOS by Move:    *    *     *      A    *     *     *    *     *      D    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *      *    *     *     *    *     *      *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx             16.0
ApproachLOS:        *                 *                 *                 C
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%                0%                0%                0%
Grade:              0%                0%                0%                0%
Peds/Hour:          0                 0                 0                 0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet           12 feet           12 feet           12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                         #5
Dist(miles):                         0.000
Speed (mph):                          0.00
SignalIndex:                        #3
Cycle Time:                              0 secs
InitVolume:                        0     0
Saturation:                        0     0
ArrivalType:                       0     0
G/C:                            0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                             0.000 0.000
gq1:                            0.00  0.00
gq2:                            0.00  0.00
gq:                             0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                               0.000
beta:                                0.000
ta (secs):                           0.000
F:                                   0.000
f:                             0.000 0.000
vcmax:                             0     0
vcg:                               0     0
vcmin:                             0     0
tp:                              0.0   0.0
p:                                   0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:    0 xxxxx xxxxx  765 xxxxx xxxxx    0     0     0 1096     0   383
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:    0 xxxxx xxxxx  765 xxxxx xxxxx    0     0     0 1096     0   383
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:   900 xxxxx xxxxx  857 xxxxx xxxxx  900   900   900  211   900   621
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```


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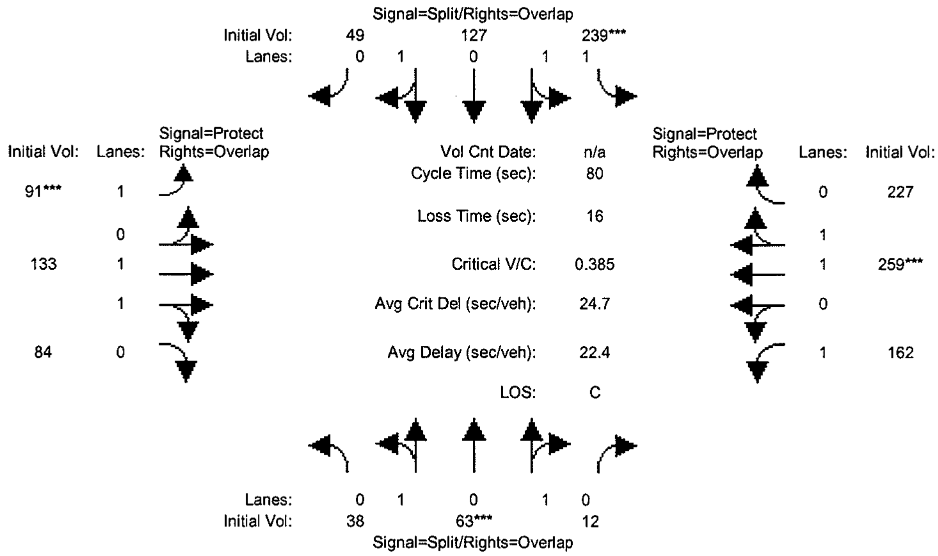
```
PotentCap:    900 xxxxx xxxxx  857 xxxxx xxxxx  900   900   900  211   900   621
                         Peak Hour Delay Signal Warrant Report
**********************************************************************************
Intersection #4 Valley Hi & Wyndham
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  704    61    80  402     0     0    0     0    36    0    99
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             16.0
-----------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=135]
   FAIL - Approach volume less than 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1382]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
**********************************************************************************
Intersection #4 Valley Hi & Wyndham
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  704    61    80  402     0     0    0     0    36    0    99
-----------|---------------||---------------||---------------||---------------|
Major Street Volume:            1247
Minor Approach Volume:           135
Minor Approach Volume Threshold: 279
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #5: Alta Valley & Bruceville



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	38	63	12	239	127	49	91	133	84	162	259	227
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	38	63	12	239	127	49	91	133	84	162	259	227
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	38	63	12	239	127	49	91	133	84	162	259	227
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	38	63	12	239	127	49	91	133	84	162	259	227
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	38	63	12	239	127	49	91	133	84	162	259	227
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	38	63	12	239	127	49	91	133	84	162	259	227
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.89	0.89	0.95	0.88	0.88
Lanes:	0.67	1.12	0.21	1.73	0.92	0.35	1.00	1.23	0.77	1.00	1.07	0.93
Final Sat.:	1174	1947	371	2977	1582	610	1805	2084	1316	1805	1789	1568
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.03	0.08	0.08	0.08	0.05	0.06	0.06	0.09	0.14	0.14
Crit Moves:		****		****			****				****	
Green/Cycle:	0.08	0.08	0.36	0.21	0.21	0.34	0.13	0.23	0.32	0.28	0.38	0.58
Volume/Cap:	0.38	0.38	0.09	0.38	0.38	0.24	0.38	0.28	0.20	0.32	0.38	0.25
Delay/Veh:	35.5	35.5	16.9	27.5	27.5	19.0	32.9	25.5	20.1	23.4	18.4	8.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.5	35.5	16.9	27.5	27.5	19.0	32.9	25.5	20.1	23.4	18.4	8.1
HCM2kAvg:	2	2	1	3	3	3	3	2	2	3	5	3
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 1 0 1 0			1 1 0 1 0			1 0 1 1 0			1 0 1 1 0		
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.98	0.98	0.98	0.98	0.98	0.98	xxxx	0.94	0.94	xxxx	0.93	0.93
LT Adj:	0.98	0.98	0.98	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.97	0.97	0.97	0.95	0.95	0.95	0.95	0.94	0.94	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.89	0.89	0.95	0.88	0.88
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.08	0.08	0.36	0.21	0.21	0.34	0.13	0.23	0.32	0.28	0.38	0.58
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	1.2	1.2	0.8	2.7	2.7	2.3	1.9	2.0	1.8	3.0	3.9	2.6
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.6	0.6	0.1	0.6	0.6	0.3	0.6	0.4	0.3	0.5	0.6	0.3
HCM2KQueue:	1.8	1.8	0.9	3.3	3.3	2.6	2.6	2.4	2.0	3.5	4.6	2.9
70th%Factor:	1.20	1.20	1.20	1.19	1.19	1.19	1.19	1.19	1.20	1.19	1.19	1.19
70th%HCM2kQ:	2.2	2.2	1.1	4.0	4.0	3.1	3.0	2.8	2.4	4.2	5.4	3.5
85th%Factor:	1.58	1.58	1.59	1.57	1.57	1.58	1.58	1.58	1.58	1.57	1.56	1.57
85th%HCM2kQ:	2.9	2.9	1.5	5.2	5.2	4.1	4.0	3.7	3.2	5.5	7.1	4.6
90th%Factor:	1.77	1.77	1.78	1.74	1.74	1.75	1.75	1.76	1.76	1.74	1.72	1.75
90th%HCM2kQ:	3.2	3.2	1.7	5.8	5.8	4.5	4.5	4.1	3.6	6.1	7.8	5.1
95th%Factor:	2.04	2.04	2.07	2.00	2.00	2.02	2.02	2.03	2.04	1.99	1.97	2.01
95th%HCM2kQ:	3.7	3.7	2.0	6.7	6.7	5.2	5.2	4.8	4.1	7.0	9.0	5.9
98th%Factor:	2.57	2.57	2.63	2.47	2.47	2.52	2.52	2.53	2.56	2.46	2.40	2.50
98th%HCM2kQ:	4.6	4.6	2.5	8.2	8.2	6.5	6.4	6.0	5.2	8.6	11.0	7.4

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 222 0 285***
Lanes: 1 0 0 0 1

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Initial Vol:
138***	1		Vol Cnt Date:	n/a		0	11
	0		Cycle Time (sec):	90		1	
245	2		Loss Time (sec):	14		1	439***
	0		Critical V/C:	0.426		0	
0	0		Avg Crit Del (sec/veh):	25.7		0	0
			Avg Delay (sec/veh):	22.7			
			LOS:	C			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	4	0	0	4	6	0	0	6	0
Volume Module:												
Base Vol:	0	0	0	285	0	222	138	245	0	0	439	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	285	0	222	138	245	0	0	439	11
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	285	0	222	138	245	0	0	439	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	285	0	222	138	245	0	0	439	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	285	0	222	138	245	0	0	439	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	285	0	222	138	245	0	0	439	11
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.95	0.95
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.95	0.05
Final Sat.:	0	0	0	1805	0	1615	1805	3610	0	0	3508	88
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.16	0.00	0.14	0.08	0.07	0.00	0.00	0.13	0.13
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.37	0.00	0.37	0.18	0.47	0.00	0.00	0.29	0.29
Volume/Cap:	0.00	0.00	0.00	0.43	0.00	0.37	0.43	0.14	0.00	0.00	0.43	0.43
Delay/Veh:	0.0	0.0	0.0	21.6	0.0	21.0	33.7	13.4	0.0	0.0	25.9	25.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	21.6	0.0	21.0	33.7	13.4	0.0	0.0	25.9	25.9
HCM2kAvg:	0	0	0	6	0	5	4	2	0	0	5	5
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Lane Group:	xxxx	xxxx	xxxx	L	xxxx	R	L	T	xxxx	xxxx	RT	RT
#LnsInGrps:	0	0	0	1	0	1	1	2	0	0	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Hev Veh Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Grade Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Area Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	1.00	1.00
LT Adj:	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Fnl Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.95	0.95
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.37	0.00	0.37	0.18	0.47	0.00	0.00	0.29	0.29
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	5.6	0.0	4.0	3.2	1.7	0.0	0.0	4.5	4.5
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	0.7	0.0	0.6	0.7	0.2	0.0	0.0	0.7	0.7
HCM2KQueue:	0.0	0.0	0.0	6.3	0.0	4.6	3.9	1.9	0.0	0.0	5.3	5.3
70th%Factor:	1.20	1.20	1.20	1.19	1.20	1.19	1.19	1.20	1.20	1.20	1.19	1.19
70th%HCM2kQ:	0.0	0.0	0.0	7.5	0.0	5.5	4.7	2.3	0.0	0.0	6.3	6.3
85th%Factor:	1.60	1.60	1.60	1.54	1.60	1.56	1.56	1.58	1.60	1.60	1.55	1.55
85th%HCM2kQ:	0.0	0.0	0.0	9.8	0.0	7.2	6.2	3.0	0.0	0.0	8.2	8.2
90th%Factor:	1.80	1.80	1.80	1.69	1.80	1.72	1.73	1.76	1.80	1.80	1.71	1.71
90th%HCM2kQ:	0.0	0.0	0.0	10.7	0.0	8.0	6.8	3.3	0.0	0.0	9.0	9.0
95th%Factor:	2.10	2.10	2.10	1.92	2.10	1.96	1.98	2.04	2.10	2.10	1.95	1.95
95th%HCM2kQ:	0.0	0.0	0.0	12.2	0.0	9.1	7.8	3.9	0.0	0.0	10.3	10.3
98th%Factor:	2.70	2.70	2.70	2.31	2.70	2.40	2.44	2.56	2.70	2.70	2.37	2.37
98th%HCM2kQ:	0.0	0.0	0.0	14.7	0.0	11.1	9.6	4.9	0.0	0.0	12.5	12.5

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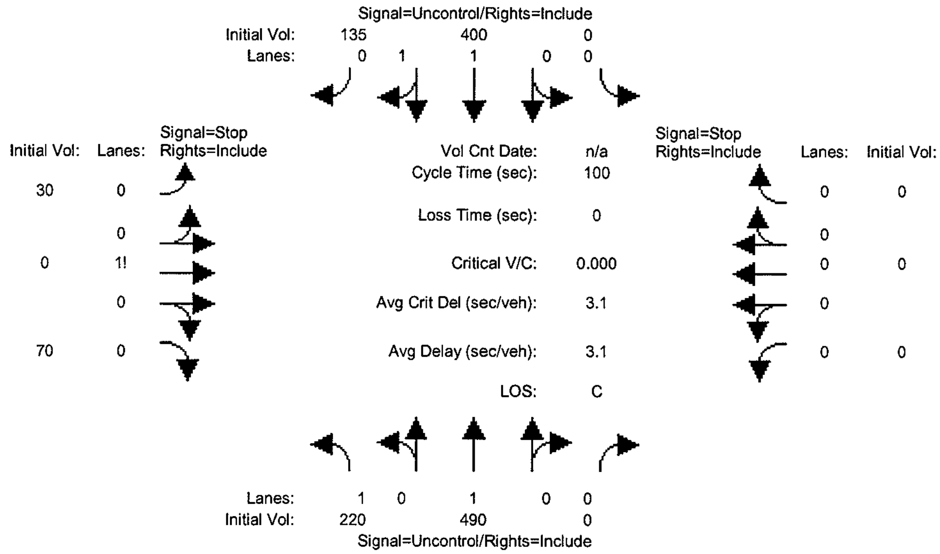
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #7: Bruceville / Kaiser Access




```
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     220  490     0     0  400   135    30     0    70     0     0     0
Growth Adj: ·1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  220  490     0     0  400   135    30     0    70     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:  220  490     0     0  400   135    30     0    70     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   220  490     0     0  400   135    30     0    70     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:   220  490     0     0  400   135    30     0    70     0     0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  535 xxxx xxxxx  xxxx xxxx xxxxx  1398 xxxx   267  xxxx xxxx xxxxx
Potent Cap.: 1043 xxxx xxxxx  xxxx xxxx xxxxx   157 xxxx   776  xxxx xxxx xxxxx
Move Cap.:   1043 xxxx xxxxx  xxxx xxxx xxxxx   131 xxxx   776  xxxx xxxx xxxxx
Volume/Cap:  0.21 xxxx  xxxx  xxxx xxxx  xxxx  0.23 xxxx  0.09  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  9.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  314 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.3 xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 21.7 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx             21.7            xxxxxx
ApproachLOS:        *                 *                 C                 *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%                0%                0%                0%
Grade:              0%                0%                0%                0%
Peds/Hour:          0                 0                 0                 0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet           12 feet           12 feet           12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:        #120
Dist(miles):       0.000
Speed (mph):        0.00
SignalIndex:       #8
Cycle Time:             0 secs
InitVolume:       0     0
Saturation:       0     0
ArrivalType:      0     0
G/C:           0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:            0.000 0.000
gq1:           0.00  0.00
gq2:           0.00  0.00
gq:            0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:              0.000
beta:               0.000
ta (secs):          0.000
F:                  0.000
f:            0.000 0.000
vcmax:            0     0
vcg:              0     0
vcmin:            0     0
tp:             0.0   0.0
p:                  0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 535 xxxxx xxxxx    0 xxxxx xxxxx 1398     0   268    0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 535 xxxxx xxxxx    0 xxxxx xxxxx 1398     0   268    0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap: 1043 xxxxx xxxxx  900 xxxxx xxxxx  157   900   776  900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:  1043 xxxxx xxxxx  900 xxxxx xxxxx  157   900   776  900   900   900
                      Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #7 Bruceville / Kaiser Access
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:         1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   220  490     0     0  400   135    30    0    70     0    0     0
ApproachDel:     xxxxxx            xxxxxx             21.7             xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=100]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1345]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                 Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #7 Bruceville / Kaiser Access
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:         1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   220  490     0     0  400   135    30    0    70     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:              1245
Minor Approach Volume:            100
Minor Approach Volume Threshold:  209
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 103 361*** 0
Lanes: 0 1 1 0 0

Signal=Protect
Rights=Overlap

Initial Vol: Lanes:
68*** 1
0
0 0
0
116 1

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 12
Critical V/C: 0.321
Avg Crit Del (sec/veh): 23.9
Avg Delay (sec/veh): 14.4
LOS: B

Signal=Protect
Rights=Include

Lanes: Initial Vol:
0 0
0
0 0
0
0 0

Lanes: 1 0 2 0 0
Initial Vol: 204*** 650 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	5	6	0	0	6	0	4	0	5	0	0	0
Volume Module:												
Base Vol:	204	650	0	0	361	103	68	0	116	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	204	650	0	0	361	103	68	0	116	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	204	650	0	0	361	103	68	0	116	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	204	650	0	0	361	103	68	0	116	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	204	650	0	0	361	103	68	0	116	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	204	650	0	0	361	103	68	0	116	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.56	0.44	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1805	3610	0	0	2716	775	1805	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.11	0.18	0.00	0.00	0.13	0.13	0.04	0.00	0.07	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green/Cycle:	0.35	0.77	0.00	0.00	0.41	0.41	0.12	0.00	0.47	0.00	0.00	0.00
Volume/Cap:	0.32	0.23	0.00	0.00	0.32	0.32	0.32	0.00	0.15	0.00	0.00	0.00
Delay/Veh:	24.9	3.5	0.0	0.0	20.7	20.7	43.0	0.0	15.8	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.9	3.5	0.0	0.0	20.7	20.7	43.0	0.0	15.8	0.0	0.0	0.0
HCM2kAvg:	5	3	0	0	5	5	2	0	2	0	0	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	1 0 2 0 0			0 0 1 1 0			1 0 0 0 1			0 0 0 0 0		
Lane Group:	L	T	xxxx	xxxx	RT	RT	L	xxxx	R	xxxx	xxxx	xxxx
#LnsInGrps:	1	2	0	0	2	2	1	0	1	0	0	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Hev Veh Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Grade Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Parking Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Bus Stp Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Area Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	0.97	0.97	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx
LT Adj:	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	1.00	1.00	0.97	0.97	0.95	1.00	0.85	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fnl Sat Adj:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.35	0.77	0.00	0.00	0.41	0.41	0.12	0.00	0.47	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.5	2.7	0.0	0.0	4.5	4.5	1.9	0.0	1.9	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.5	0.3	0.0	0.0	0.5	0.5	0.5	0.0	0.2	0.0	0.0	0.0
HCM2KQueue:	5.0	3.0	0.0	0.0	5.0	5.0	2.4	0.0	2.1	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	5.9	3.5	0.0	0.0	5.9	5.9	2.8	0.0	2.5	0.0	0.0	0.0
85th%Factor:	1.55	1.57	1.60	1.60	1.55	1.55	1.58	1.60	1.58	1.60	1.60	1.60
85th%HCM2kQ:	7.8	4.7	0.0	0.0	7.8	7.8	3.7	0.0	3.3	0.0	0.0	0.0
90th%Factor:	1.71	1.74	1.80	1.80	1.71	1.71	1.76	1.80	1.76	1.80	1.80	1.80
90th%HCM2kQ:	8.6	5.2	0.0	0.0	8.5	8.5	4.1	0.0	3.7	0.0	0.0	0.0
95th%Factor:	1.95	2.01	2.10	2.10	1.95	1.95	2.03	2.10	2.03	2.10	2.10	2.10
95th%HCM2kQ:	9.8	6.0	0.0	0.0	9.8	9.8	4.8	0.0	4.3	0.0	0.0	0.0
98th%Factor:	2.38	2.50	2.70	2.70	2.38	2.38	2.53	2.70	2.55	2.70	2.70	2.70
98th%HCM2kQ:	11.9	7.4	0.0	0.0	11.9	11.9	6.0	0.0	5.3	0.0	0.0	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #9: Arroyo Vista & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 0 0 0
Lanes: 0 0 0 0 0

Signal=Uncontrol
Rights=Include

Initial Vol:	Lanes:
0	0
	0
157	0
	1
14	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	1.3
Avg Delay (sec/veh):	1.3
LOS:	B

Signal=Uncontrol
Rights=Include

Lanes:	Initial Vol:
0	0
0	
1	195
0	
1	17

Lanes: 0 0 1! 0 0
Initial Vol: 22 0 19
Signal=Stop/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      22    0    19     0    0     0     0  157    14    17  195     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   22    0    19     0    0     0     0  157    14    17  195     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   22    0    19     0    0     0     0  157    14    17  195     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    22    0    19     0    0     0     0  157    14    17  195     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    22    0    19     0    0     0     0  157    14    17  195     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  393 xxxx   164  xxxx xxxx xxxxx  xxxx xxxx xxxxx   171 xxxx xxxxx
Potent Cap.:  615 xxxx   886  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1418 xxxx xxxxx
Move Cap.:    610 xxxx   886  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1418 xxxx xxxxx
Volume/Cap:  0.04 xxxx  0.02  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.6 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  713 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 10.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     *    *     *
ApproachDel:      10.4            xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        B                *                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                       #26
Dist(miles):                                                      0.000
Speed (mph):                                                       0.00
SignalIndex:                                                      #8
Cycle Time:                                                            0 secs
InitVolume:                                                     0      0
Saturation:                                                     0      0
ArrivalType:                                                    0      0
G/C:                                                         0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                          0.000 0.000
gq1:                                                         0.00  0.00
gq2:                                                         0.00  0.00
gq:                                                          0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                            0.000
beta:                                                             0.000
ta (secs):                                                        0.000
F:                                                                0.000
f:                                                          0.000 0.000
vcmax:                                                          0      0
vcg:                                                            0      0
vcmin:                                                          0      0
tp:                                                           0.0    0.0
p:                                                                0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                          0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 393     0   164    0     0     0    0 xxxxx xxxxx  171 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol: 393     0   164    0     0     0    0 xxxxx xxxxx  171 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  615   900   886  900   900   900  900 xxxxx xxxxx 1418 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:    615   900   886  900   900   900  900 xxxxx xxxxx 1418 xxxxx xxxxx
                       Peak Hour Delay Signal Warrant Report
*********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
*********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:    22    0    19     0    0     0     0  157    14    17  195     0
ApproachDel:      10.4            xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=424]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
*********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
*********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:    22    0    19     0    0     0     0  157    14    17  195     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             383
Minor Approach Volume:           41
Minor Approach Volume Threshold: 615
```


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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #10: Kaiser & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 22 0 51
Lanes: 0 0 1! 0 0

Signal=Uncontrol
Rights=Include

Initial Vol:	Lanes:			Lanes:	Initial Vol:
65	1	Vol Cnt Date:	n/a	0	135
	0	Cycle Time (sec):	100	1	
120	1	Loss Time (sec):	0	0	76
	0	Critical V/C:	0.000	0	
0	0	Avg Crit Del (sec/veh):	2.8	0	0
		Avg Delay (sec/veh):	2.8		
		LOS:	B		

Signal=Uncontrol
Rights=Include

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Stop/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0    0     51    0   22     65  120    0      0   76  135
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   0    0    0     51    0   22     65  120    0      0   76  135
Added Vol:     0    0    0      0    0    0      0    0    0      0    0    0
PasserByVol:   0    0    0      0    0    0      0    0    0      0    0    0
Initial Fut:   0    0    0     51    0   22     65  120    0      0   76  135
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    0    0    0     51    0   22     65  120    0      0   76  135
Reduct Vol:    0    0    0      0    0    0      0    0    0      0    0    0
Final Vol.:    0    0    0     51    0   22     65  120    0      0   76  135
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   394 xxxx   144   211 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   615 xxxx   909  1372 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   593 xxxx   909  1372 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.09 xxxx  0.02  0.05 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *    *     *    *    *      A    *    *      *    *    *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  662 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *    *     *    B    *      *    *    *      *    *    *
ApproachDel:     xxxxxx           11.1            xxxxxx           xxxxxx
ApproachLOS:        *               B                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:            0%              0%              0%              0%
Grade:             0%              0%              0%              0%
Peds/Hour:         0               0               0               0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet         12 feet         12 feet         12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                       #26
Dist(miles):                                                     0.000
Speed (mph):                                                      0.00
SignalIndex:                                                      #8
Cycle Time:                                                          0 secs
InitVolume:                                                     0    0
Saturation:                                                     0    0
ArrivalType:                                                    0    0
G/C:                                                         0.00 0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                          0.000 0.000
gq1:                                                         0.00  0.00
gq2:                                                         0.00  0.00
gq:                                                          0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                           0.000
beta:                                                            0.000
ta (secs):                                                       0.000
F:                                                               0.000
f:                                                          0.000 0.000
vcmax:                                                          0    0
vcg:                                                            0    0
vcmin:                                                          0    0
tp:                                                           0.0   0.0
p:                                                               0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0     0     0  394     0   144  211 xxxxx xxxxx    0 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol:   0     0     0  394     0   144  211 xxxxx xxxxx    0 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900   900   900  615   900   909 1372 xxxxx xxxxx  900 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:    900   900   900  615   900   909 1372 xxxxx xxxxx  900 xxxxx xxxxx
                      Peak Hour Delay Signal Warrant Report
**********************************************************************************
Intersection #10 Kaiser & Wyndham
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0    0     51    0   22     65  120    0      0   76   135
ApproachDel:    xxxxxx             11.1             xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=73]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=469]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
**********************************************************************************
Intersection #10 Kaiser & Wyndham
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0    0     51    0   22     65  120    0      0   76   135
------------|---------------||---------------||---------------||---------------|
Major Street Volume:           396
Minor Approach Volume:          73
Minor Approach Volume Threshold: 604
```

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	1.00	0.85	1.00	1.00	0.85	1.00	0.98	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	5085	1561	3433	3539	1561	3433	1728	1483	3433	3539	1562
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	5085	1561	3433	3539	1561	3433	1728	1483	3433	3539	1562
Volume (vph)	135	770	41	608	705	541	28	326	617	272	147	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	770	41	608	705	541	28	326	617	272	147	13
RTOR Reduction (vph)	0	0	21	0	0	303	0	4	281	0	0	8
Lane Group Flow (vph)	135	770	20	608	705	238	28	376	282	272	147	5
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	6.8	20.9	20.9	22.4	36.5	36.5	3.0	28.1	28.1	12.3	37.4	37.4
Effective Green, g (s)	6.3	21.6	21.6	21.9	37.2	37.2	2.0	28.8	28.8	11.3	38.1	38.1
Actuated g/C Ratio	0.06	0.22	0.22	0.22	0.37	0.37	0.02	0.29	0.29	0.11	0.38	0.38
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	217	1103	339	755	1322	583	69	500	429	389	1354	598
v/s Ratio Prot	0.04	c0.15		c0.18	0.20		0.01	c0.22		c0.08	0.04	
v/s Ratio Perm			0.01			0.15			0.19			0.00
v/c Ratio	0.62	0.70	0.06	0.81	0.53	0.41	0.41	0.75	0.66	0.70	0.11	0.01
Uniform Delay, d1	45.5	36.0	30.9	36.8	24.4	23.1	48.2	32.2	31.1	42.5	19.8	19.0
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	4.0	1.6	0.0	5.9	0.2	0.2	1.4	5.6	2.8	4.4	0.0	0.0
Delay (s)	49.4	37.6	31.0	42.7	24.6	23.2	49.6	37.8	33.8	46.9	19.8	19.0
Level of Service	D	D	C	D	C	C	D	D	C	D	B	B
Approach Delay (s)		39.0			30.2			35.8			36.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	99.6	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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	1479	180	0	1474	405	0	0	0	541	0	435
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1479	180	0	1474	405	0	0	0	541	0	435
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	22
Lane Group Flow (vph)	0	1479	180	0	1474	405	0	0	0	541	0	413
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		62.1	100.0		61.9	100.0				27.7		27.7
Effective Green, g (s)		63.1	100.0		63.1	100.0				28.9		28.9
Actuated g/C Ratio		0.63	1.00		0.63	1.00				0.29		0.29
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		3209	1583		3209	2787				992		457
v/s Ratio Prot		c0.29			0.29							
v/s Ratio Perm			0.11			0.15				0.16		c0.26
v/c Ratio		0.46	0.11		0.46	0.15				0.55		0.90
Uniform Delay, d1		9.6	0.0		9.6	0.0				30.0		34.2
Progression Factor		1.00	1.00		0.74	1.00				1.00		1.00
Incremental Delay, d2		0.5	0.1		0.4	0.1				0.3		20.5
Delay (s)		10.1	0.1		7.5	0.1				30.3		54.8
Level of Service		B	A		A	A				C		D
Approach Delay (s)		9.0			5.9			0.0			41.2	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱	↰↰		↱↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	1512	508	0	1508	1216	371	0	370	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1512	508	0	1508	1216	371	0	370	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	75	0	0	0
Lane Group Flow (vph)	0	1512	508	0	1508	1216	371	0	295	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		75.6	100.0		75.9	100.0	13.8		13.8			
Effective Green, g (s)		76.9	100.0		76.9	100.0	15.1		15.1			
Actuated g/C Ratio		0.77	1.00		0.77	1.00	0.15		0.15			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3910	1550		3910	2787	518		421			
v/s Ratio Prot		0.30			0.30							
v/s Ratio Perm			0.33			c0.44	c0.11		0.11			
v/c Ratio		0.39	0.33		0.39	0.44	0.72		0.70			
Uniform Delay, d1		3.8	0.0		3.8	0.0	40.4		40.3			
Progression Factor		0.91	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.3	0.5		0.3	0.5	3.9		4.3			
Delay (s)		3.7	0.5		4.1	0.5	44.3		44.6			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		2.9			2.5			44.5			0.0	
Approach LOS		A			A			D			A	

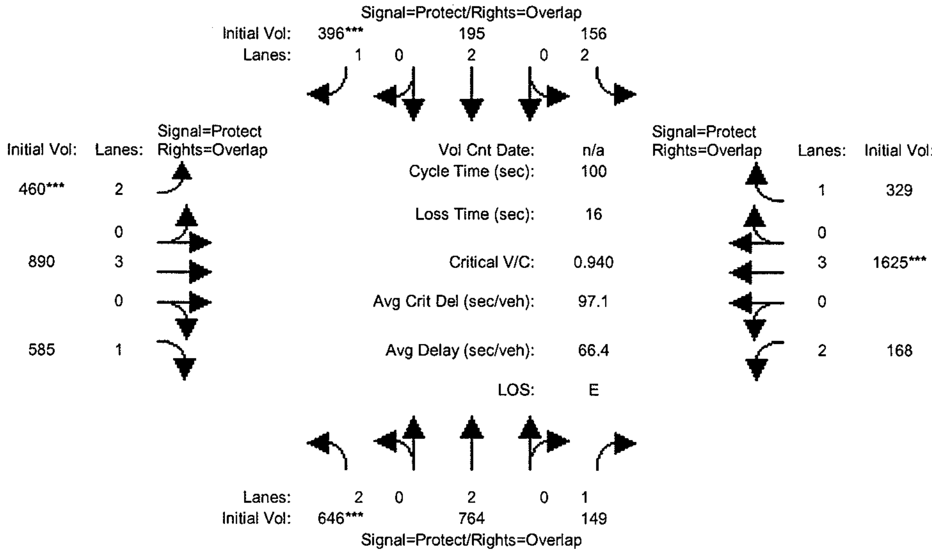
Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
Existing AM

Intersection #14: CALVINE RD / POWER INN RD



Approach:	North Bound L	North Bound T	North Bound R	South Bound L	South Bound T	South Bound R	East Bound L	East Bound T	East Bound R	West Bound L	West Bound T	West Bound R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	646	764	149	156	195	396	460	890	585	168	1625	329
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	646	764	149	156	195	396	460	890	585	168	1625	329
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	646	764	149	156	195	396	460	890	585	168	1625	329
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	646	764	149	156	195	396	460	890	585	168	1625	329
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	646	764	149	156	195	396	460	890	585	168	1625	329
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	711	764	149	172	195	396	506	890	585	185	1625	329
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.26	0.28	0.11	0.06	0.07	0.29	0.18	0.22	0.43	0.07	0.39	0.24
Crit Vol:	355					396	0				542	
Crit Moves:	****					****	****				****	

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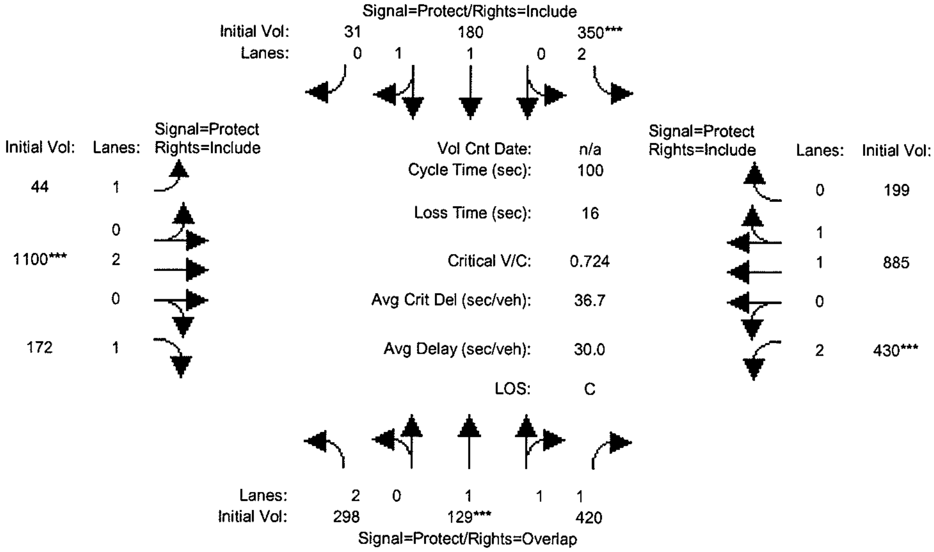
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #1: Valley Hi & Mack




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     4   10     0     4    6     0     4   26     0     4   38     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     298  129   420   350  180    31    44 1100   172   430  885   199
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  298  129   420   350  180    31    44 1100   172   430  885   199
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  298  129   420   350  180    31    44 1100   172   430  885   199
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   298  129   420   350  180    31    44 1100   172   430  885   199
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  298  129   420   350  180    31    44 1100   172   430  885   199
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   298  129   420   350  180    31    44 1100   172   430  885   199
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.84  0.84  0.92 0.93  0.93  0.95 0.95  0.85  0.92 0.92  0.92
Lanes:       2.00 1.00  2.00  2.00 1.71  0.29  1.00 2.00  1.00  2.00 1.63  0.37
Final Sat.:  3502 1597  3195  3502 3012   519  1805 3610  1615  3502 2865   644
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.08  0.13  0.10 0.06  0.06  0.02 0.30  0.11  0.12 0.31  0.31
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.15 0.11  0.28  0.14 0.10  0.10  0.06 0.42  0.42  0.17 0.53  0.53
Volume/Cap:  0.58 0.72  0.47  0.72 0.58  0.58  0.43 0.72  0.25  0.72 0.58  0.58
Delay/Veh:   41.5 46.4  30.0  46.6 45.1  45.1  48.6 25.9  19.0  43.7 16.2  16.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  41.5 46.4  30.0  46.6 45.1  45.1  48.6 25.9  19.0  43.7 16.2  16.2
HCM2kAvg:       5    5     6     7    4     4     2   15     3     8   11    11
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        2  0  1  1  1    2  0  1  1  0    1  0  2  0  1    2  0  1  1  0
Lane Group:    L   RT    RT     L   RT    RT     L    T     R     L   RT    RT
#LnsInGrps:    2    3     3     2    2     2     1    2     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Bus Stp Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx 0.89  0.89  xxxx 0.98  0.98  xxxx xxxx  0.85  xxxx 0.97  0.97
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 0.89  0.89  0.95 0.98  0.98  0.95 1.00  0.85  0.95 0.97  0.97
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 0.97 0.95  0.95  0.97 0.95  0.95  1.00 0.95  1.00  0.97 0.95  0.95
Fnl Sat Adj: 0.92 0.84  0.84  0.92 0.93  0.93  0.95 0.95  0.85  0.92 0.92  0.92
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < No    > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < < <    Actuated     > > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                         2000 HCM Operations Method
                          Future Volume Alternative
*******************************************************************************
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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.15	0.11	0.28	0.14	0.10	0.10	0.06	0.42	0.42	0.17	0.53	0.53
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.1	3.5	4.8	4.9	2.8	2.8	1.2	12.7	3.1	6.0	10.1	10.1
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	1.3	2.0	0.9	2.1	1.2	1.2	0.7	2.4	0.3	2.2	1.3	1.3
HCM2KQueue:	5.3	5.4	5.7	7.0	4.0	4.0	1.9	15.1	3.4	8.1	11.5	11.5
70th%Factor:	1.19	1.19	1.19	1.18	1.19	1.19	1.20	1.17	1.19	1.18	1.18	1.18
70th%HCM2kQ:	6.3	6.5	6.7	8.3	4.8	4.8	2.3	17.7	4.1	9.6	13.5	13.5
85th%Factor:	1.55	1.55	1.55	1.54	1.56	1.56	1.58	1.48	1.57	1.53	1.50	1.50
85th%HCM2kQ:	8.3	8.4	8.8	10.8	6.3	6.3	3.1	22.4	5.4	12.4	17.3	17.3
90th%Factor:	1.71	1.70	1.70	1.68	1.73	1.73	1.76	1.59	1.74	1.67	1.63	1.63
90th%HCM2kQ:	9.1	9.3	9.7	11.8	6.9	6.9	3.4	24.0	6.0	13.6	18.7	18.7
95th%Factor:	1.95	1.94	1.94	1.91	1.98	1.98	2.04	1.76	2.00	1.88	1.82	1.82
95th%HCM2kQ:	10.4	10.6	11.0	13.4	8.0	8.0	4.0	26.6	6.9	15.3	20.9	20.9
98th%Factor:	2.36	2.36	2.35	2.28	2.43	2.43	2.56	2.01	2.47	2.23	2.11	2.11
98th%HCM2kQ:	12.6	12.8	13.3	16.0	9.8	9.8	5.0	30.4	8.5	18.2	24.3	24.3

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Overlap
Initial Vol: 495*** 0 0
Lanes: 2 0 0 0 0

West approach (Signal=Protect, Rights=Ignore):

Initial Vol:	Lanes:
0	0
	0
1710***	2
	0
170	1

Vol Cnt Date: n/a
Cycle Time (sec): 60
Loss Time (sec): 8
Critical V/C: 1.026
Avg Crit Del (sec/veh): 27.1
Avg Delay (sec/veh): 20.2
LOS: C

East approach (Signal=Protect, Rights=Include):

Lanes:	Initial Vol:
0	0
0	
2	1131
0	
1	436***

Lanes: 0 0 0 0 1
Initial Vol: 0 0 1592
Signal=Protect/Rights=Ignore

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	1592	0	0	495	0	1710	170	436	1131	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	1592	0	0	495	0	1710	170	436	1131	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	1592	0	0	495	0	1710	170	436	1131	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	495	0	1710	0	436	1131	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	495	0	1710	0	436	1131	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	495	0	1710	0	436	1131	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.47	0.00	0.24	0.31	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.62	0.00	1.01	0.45	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	72.2	0.0	3.7	0.0	67.7	4.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	72.2	0.0	3.7	0.0	67.7	4.1	0.0
HCM2kAvg:	0	0	0	0	0	10	0	8	0	15	5	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 1			0 0 0 0 2			0 0 2 0 1			1 0 2 0 0		
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	4.1	0.0	6.5	0.0	7.6	4.1	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	5.9	0.0	1.6	0.0	7.8	0.8	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	10.1	0.0	8.1	0.0	15.4	4.9	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.18	1.20	1.18	1.20	1.17	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	11.9	0.0	9.6	0.0	18.0	5.8	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.51	1.60	1.53	1.60	1.48	1.55	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	15.2	0.0	12.4	0.0	22.8	7.6	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.64	1.80	1.67	1.80	1.59	1.71	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	16.5	0.0	13.5	0.0	24.4	8.4	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.84	2.10	1.88	2.10	1.75	1.96	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	18.6	0.0	15.3	0.0	27.0	9.6	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.16	2.70	2.24	2.70	2.01	2.38	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	21.8	0.0	18.1	0.0	30.9	11.7	0.0

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 73 483 139***
Lanes: 1 0 2 0 1

Signal=Split
Rights=Include

Initial Vol:	Lanes:
54	1
	0
27***	1!
	0
12	0

Vol Cnt Date:	n/a
Cycle Time (sec):	90
Loss Time (sec):	16
Critical V/C:	0.441
Avg Crit Del (sec/veh):	29.1
Avg Delay (sec/veh):	26.5
LOS:	C

Signal=Split
Rights=Include

Lanes:	Initial Vol:
2	359***
0	
0	74
1	
1	234

Lanes: 1 0 2 0 1
Initial Vol: 19 444*** 84
Signal=Protect/Rights=Include

```
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4     4     0     6     6     0     0     4     0     0     4     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     19   444    84   139   483    73    54    27    12   234    74   359
Growth Adj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  19   444    84   139   483    73    54    27    12   234    74   359
Added Vol:     0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:  19   444    84   139   483    73    54    27    12   234    74   359
User Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:   19   444    84   139   483    73    54    27    12   234    74   359
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  19   444    84   139   483    73    54    27    12   234    74   359
PCE Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:   19   444    84   139   483    73    54    27    12   234    74   359
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment: 0.95  0.95  0.85  0.95  0.95  0.85  0.95  0.95  0.95  0.96  0.96  0.75
Lanes:      1.00  2.00  1.00  1.00  2.00  1.00  1.41  0.41  0.18  1.52  0.48  2.00
Final Sat.: 1805  3610  1615  1805  3610  1615  2553   741   329  2780   879  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.01  0.12  0.05  0.08  0.13  0.05  0.02  0.04  0.04  0.08  0.08  0.13
Crit Moves:       ****        ****                    ****                    ****
Green/Cycle: 0.11 0.28  0.28  0.17  0.34  0.34  0.08  0.08  0.08  0.29  0.29  0.29
Volume/Cap: 0.09  0.44  0.19  0.44  0.39  0.13  0.26  0.44  0.44  0.29  0.29  0.44
Delay/Veh:  36.0  27.0  24.9  34.2  22.8  20.6  39.1  40.8  40.8  25.2  25.2  26.6
User DelAdj: 1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh: 36.0  27.0  24.9  34.2  22.8  20.6  39.1  40.8  40.8  25.2  25.2  26.6
HCM2kAvg:      1     5     2     4     5     1     1     2     2     4     4     4
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        1  0  2  0  1    1  0  2  0  1    1  0  1! 0  0    1  1  0  0  2
Lane Group:   L     T     R     L     T     R   LTR   LTR   LTR    LT    LT     R
#LnsInGrps:    1     2     1     1     2     1     2     1     1     2     2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12    12    12    12    12    12    12    12    12    12    12    12
CrosswalkWid         8                 8                 8                 8
% Hev Veh:           0                 0                 0                 0
Grade:              0%                0%                0%                0%
Parking/Hr:         No                No                No                No
Bus Stp/Hr:          0                 0                 0                 0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                 0                 0                 0
ExclusiveRT:     Include           Include           Include           Include
% RT Prtct:          0                 0                 0                 0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1  xxxx  xxxx     1  xxxx  xxxx     4     4     4     4     4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx  xxxx  1.00  1.00  1.00  1.00  xxxx  xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx  xxxx  1.00  1.00  1.00  1.00  xxxx  xxxx  1.00
Area Adj:    1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
RT Adj:      xxxx xxxx  0.85  xxxx  xxxx  0.85  0.98  0.98  0.98  xxxx  xxxx  0.85
LT Adj:      0.95 xxxx xxxxx  0.95  xxxx xxxxx  0.97  0.97  0.97  0.96  0.96 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95  1.00  0.85  0.95  0.95  0.95  0.96  0.96  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00  0.95  1.00  1.00  1.00  1.00  1.00  1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95  0.95  0.85  0.95  0.95  0.95  0.96  0.96  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < < <   Actuated    > > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                       2000 HCM Operations Method
                        Future Volume Alternative
```

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Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.11	0.28	0.28	0.17	0.34	0.34	0.08	0.08	0.08	0.29	0.29	0.29
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.4	4.6	1.6	3.3	4.6	1.3	0.9	1.6	1.6	3.1	3.1	3.7
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	0.8	0.2	0.8	0.6	0.2	0.3	0.7	0.7	0.4	0.4	0.8
HCM2KQueue:	0.6	5.3	1.8	4.0	5.2	1.4	1.3	2.4	2.4	3.5	3.5	4.4
70th%Factor:	1.20	1.19	1.20	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	0.7	6.3	2.2	4.8	6.2	1.7	1.5	2.8	2.8	4.2	4.2	5.3
85th%Factor:	1.59	1.55	1.58	1.56	1.55	1.59	1.59	1.58	1.58	1.57	1.57	1.56
85th%HCM2kQ:	0.9	8.3	2.9	6.3	8.1	2.2	2.0	3.7	3.7	5.5	5.5	6.9
90th%Factor:	1.79	1.71	1.77	1.73	1.71	1.77	1.78	1.76	1.76	1.74	1.74	1.72
90th%HCM2kQ:	1.0	9.1	3.2	7.0	8.9	2.5	2.2	4.1	4.1	6.1	6.1	7.6
95th%Factor:	2.08	1.95	2.04	1.98	1.95	2.05	2.06	2.03	2.03	1.99	1.99	1.97
95th%HCM2kQ:	1.1	10.4	3.7	8.0	10.2	2.9	2.6	4.8	4.8	7.0	7.0	8.7
98th%Factor:	2.66	2.36	2.57	2.43	2.37	2.60	2.61	2.53	2.53	2.46	2.46	2.41
98th%HCM2kQ:	1.5	12.6	4.7	9.8	12.4	3.7	3.3	6.0	6.0	8.7	8.7	10.7

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 590 110
Lanes: 0 0 2 0 1

Initial Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Initial Vol:
0	0		Vol Cnt Date:	n/a		1	136
			Cycle Time (sec):	100			
	0		Loss Time (sec):	0		0	
0	0		Critical V/C:	0.000		0	0
	0		Avg Crit Del (sec/veh):	3.2		0	
0	0		Avg Delay (sec/veh):	3.2		1	75
			LOS:	C			

Lanes: 0 0 1 1 0
Initial Vol: 0 411 42
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  411   42    110  590    0      0    0    0     75    0  136
Growth Adj:  1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00
Initial Bse:   0  411   42    110  590    0      0    0    0     75    0  136
Added Vol:     0    0    0      0    0    0      0    0    0      0    0    0
PasserByVol:   0    0    0      0    0    0      0    0    0      0    0    0
Initial Fut:   0  411   42    110  590    0      0    0    0     75    0  136
User Adj:    1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00
PHF Volume:    0  411   42    110  590    0      0    0    0     75    0  136
Reduct Vol:    0    0    0      0    0    0      0    0    0      0    0    0
Final Vol.:    0  411   42    110  590    0      0    0    0     75    0  136
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx    4.1 xxxx xxxxx xxxxx xxxx xxxxx    6.8 xxxx  6.9
FollowUpTim:xxxxx xxxx xxxxx    2.2 xxxx xxxxx xxxxx xxxx xxxxx    3.5 xxxx  3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx    453 xxxx xxxxx  xxxx xxxx xxxxx    947 xxxx  227
Potent Cap.: xxxx xxxx xxxxx   1118 xxxx xxxxx  xxxx xxxx xxxxx    263 xxxx  783
Move Cap.:   xxxx xxxx xxxxx   1118 xxxx xxxxx  xxxx xxxx xxxxx    243 xxxx  783
Volume/Cap:  xxxx xxxx  xxxx   0.10 xxxx  xxxx  xxxx xxxx  xxxx   0.31 xxxx 0.17
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx    0.3 xxxx xxxxx xxxxx xxxx xxxxx    1.3 xxxx  0.6
Stopped Del:xxxxx xxxx xxxxx    8.6 xxxx xxxxx xxxxx xxxx xxxxx   26.3 xxxx 10.6
LOS by Move:   *    *    *      A    *    *      *    *    *      D    *    B
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *    *      *    *    *      *    *    *      *    *    *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            16.1
ApproachLOS:       *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:           0%               0%               0%               0%
Grade:            0%               0%               0%               0%
Peds/Hour:        0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:      12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                           #5
Dist(miles):                          0.000
Speed (mph):                           0.00
SignalIndex:                          #3
Cycle Time:                               0 secs
InitVolume:                        0      0
Saturation:                        0      0
ArrivalType:                       0      0
G/C:                            0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                             0.000 0.000
gq1:                            0.00  0.00
gq2:                            0.00  0.00
gq:                             0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                              0.000
beta:                               0.000
ta (secs):                          0.000
F:                                  0.000
f:                             0.000 0.000
vcmax:                             0      0
vcg:                               0      0
vcmin:                             0      0
tp:                              0.0    0.0
p:                                  0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:       0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0 xxxxx xxxxx  453 xxxxx xxxxx    0     0     0  947     0   227
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:   0 xxxxx xxxxx  453 xxxxx xxxxx    0     0     0  947     0   227
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx 1118 xxxxx xxxxx  900   900   900  263   900   783
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:    900 xxxxx xxxxx 1118 xxxxx xxxxx  900   900   900  263   900   783
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  411    42   110  590     0     0     0     0    75     0   136
ApproachDel:     xxxxxx            xxxxxx            xxxxxx             16.1
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.9]
    FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=211]
    SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1364]
    SUCCEED - Total volume greater than or equal to 650 for intersection
              with less than four approaches.
                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  411    42   110  590     0     0     0     0    75     0   136
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1153
Minor Approach Volume:            211
Minor Approach Volume Threshold: 313
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #5: Alta Valley & Bruceville

Signal=Split/Rights=Include
Initial Vol: 120*** 64 313
Lanes: 0 1 0 1 1

Westbound side — Signal=Split, Rights=Include

Initial Vol:	Lanes:	Signal=Split Rights=Include
63	1	
	0	
181***	1	
	1	
33	0	

Vol Cnt Date:	n/a
Cycle Time (sec):	80
Loss Time (sec):	16
Critical V/C:	0.610
Avg Crit Del (sec/veh):	29.1
Avg Delay (sec/veh):	29.0
LOS:	C

Signal=Split Rights=Include	Lanes:	Initial Vol:
	0	332***
	1	
	1	367
	0	
	1	37

Lanes: 0 1 0 1 0
Initial Vol: 82 203*** 127
Signal=Split/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	82	203	127	313	64	120	63	181	33	37	367	332
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	82	203	127	313	64	120	63	181	33	37	367	332
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	82	203	127	313	64	120	63	181	33	37	367	332
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	82	203	127	313	64	120	63	181	33	37	367	332
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	203	127	313	64	120	63	181	33	37	367	332
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	82	203	127	313	64	120	63	181	33	37	367	332
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.90	0.89	0.89	0.89	0.95	0.93	0.93	0.95	0.88	0.88
Lanes:	0.40	0.98	0.62	1.89	0.39	0.72	1.00	1.69	0.31	1.00	1.05	0.95
Final Sat.:	679	1680	1051	3186	651	1221	1805	2983	544	1805	1761	1593
Capacity Analysis Module:												
Vol/Sat:	0.12	0.12	0.12	0.10	0.10	0.10	0.03	0.06	0.06	0.02	0.21	0.21
Crit Moves:		****				****		****				****
Green/Cycle:	0.20	0.20	0.20	0.16	0.16	0.16	0.10	0.10	0.10	0.34	0.34	0.34
Volume/Cap:	0.61	0.61	0.61	0.61	0.61	0.61	0.35	0.61	0.61	0.06	0.61	0.61
Delay/Veh:	30.9	30.9	30.9	32.6	32.6	32.6	34.8	37.7	37.7	17.7	22.9	22.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.9	30.9	30.9	32.6	32.6	32.6	34.8	37.7	37.7	17.7	22.9	22.9
HCM2kAvg:	6	6	6	5	5	5	2	4	4	1	8	8

HCM Ops Adjusted Lane Utilization Module:

	North Bound			South Bound			East Bound			West Bound		
Lanes:	0 1	0 1	0	1 1	0 1	0	1 0	1 1	0	1 0	1 1	0
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2

HCM Ops Input Saturation Adj Module:

	North Bound			South Bound			East Bound			West Bound		
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	

HCM Ops f(lt) Adj Case Module:

	North Bound			South Bound			East Bound			West Bound		
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx

HCM Ops Saturation Adj Module:

	North Bound			South Bound			East Bound			West Bound		
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.95	0.95	0.95	0.96	0.96	0.96	xxxx	0.98	0.98	xxxx	0.93	0.93
LT Adj:	0.99	0.99	0.99	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.94	0.94	0.94	0.93	0.93	0.93	0.95	0.98	0.98	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.90	0.90	0.90	0.89	0.89	0.89	0.95	0.93	0.93	0.95	0.88	0.88

Delay Adjustment Factor Module:

	North Bound			South Bound			East Bound			West Bound		
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.20	0.20	0.20	0.16	0.16	0.16	0.10	0.10	0.10	0.34	0.34	0.34
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.2	4.2	4.2	3.5	3.5	3.5	1.4	2.3	2.3	0.6	6.5	6.5
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	1.4	1.4	1.4	1.4	1.4	1.4	0.5	1.4	1.4	0.1	1.5	1.5
HCM2KQueue:	5.7	5.7	5.7	5.0	5.0	5.0	1.9	3.6	3.6	0.6	7.9	7.9
70th%Factor:	1.19	1.19	1.19	1.19	1.19	1.19	1.20	1.19	1.19	1.20	1.18	1.18
70th%HCM2kQ:	6.7	6.7	6.7	5.9	5.9	5.9	2.3	4.3	4.3	0.8	9.4	9.4
85th%Factor:	1.55	1.55	1.55	1.55	1.55	1.55	1.58	1.57	1.57	1.59	1.53	1.53
85th%HCM2kQ:	8.8	8.8	8.8	7.7	7.7	7.7	3.0	5.7	5.7	1.0	12.2	12.2
90th%Factor:	1.70	1.70	1.70	1.71	1.71	1.71	1.76	1.73	1.73	1.79	1.67	1.67
90th%HCM2kQ:	9.6	9.6	9.6	8.5	8.5	8.5	3.3	6.3	6.3	1.2	13.3	13.3
95th%Factor:	1.94	1.94	1.94	1.96	1.96	1.96	2.04	1.99	1.99	2.08	1.89	1.89
95th%HCM2kQ:	11.0	11.0	11.0	9.7	9.7	9.7	3.9	7.2	7.2	1.3	15.0	15.0
98th%Factor:	2.35	2.35	2.35	2.38	2.38	2.38	2.56	2.46	2.46	2.65	2.24	2.24
98th%HCM2kQ:	13.3	13.3	13.3	11.8	11.8	11.8	4.9	8.9	8.9	1.7	17.8	17.8

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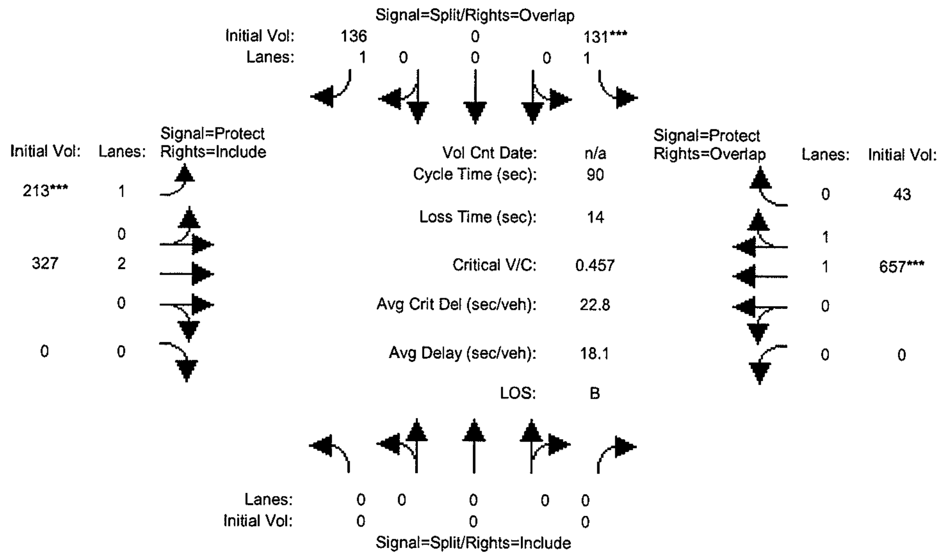
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #6: SR 99 SB Ramps & Bruceville




```
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0     4    0     0     4    6     0     0    6     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0   131    0   136   213  327     0     0  657    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   131    0   136   213  327     0     0  657    43
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   131    0   136   213  327     0     0  657    43
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   131    0   136   213  327     0     0  657    43
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   131    0   136   213  327     0     0  657    43
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0   131    0   136   213  327     0     0  657    43
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.95 1.00  0.85  0.95 0.95  1.00  1.00 0.94  0.94
Lanes:       0.00 0.00  0.00  1.00 0.00  1.00  1.00 2.00  0.00  0.00 1.88  0.12
Final Sat.:     0    0     0  1805    0  1615  1805 3610     0     0 3358   220
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.07 0.00  0.08  0.12 0.09  0.00  0.00 0.20  0.20
Crit Moves:                   ****             ****                  ****
Green/Cycle: 0.00 0.00  0.00  0.16 0.00  0.42  0.26 0.69  0.00  0.00 0.43  0.59
Volume/Cap:  0.00 0.00  0.00  0.46 0.00  0.20  0.46 0.13  0.00  0.00 0.46  0.33
Delay/Veh:    0.0  0.0   0.0  35.5  0.0  16.9  28.8  4.9   0.0   0.0 18.5   9.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  35.5  0.0  16.9  28.8  4.9   0.0   0.0 18.5   9.7
HCM2kAvg:       0    0     0     4    0     2     6    2     0     0    7     5
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
Lane Group:  xxxx xxxx  xxxx     L xxxx     R     L    T  xxxx  xxxx RT      RT
#LnsInGrps:     0    0     0     1    0     1     1    2     0     0    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:   < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:  xxxx xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
Hev Veh Adj: xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
Grade Adj:   xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
Parking Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  xxxx 1.00  1.00
Bus Stp Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  xxxx 1.00  1.00
Area Adj:    xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
RT Adj:      xxxx xxxx xxxxx  xxxx xxxx  0.85  xxxx xxxx xxxxx  xxxx 0.99  0.99
LT Adj:      xxxx xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx  xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 1.00 1.00  1.00  0.95 1.00  0.85  0.95 1.00  1.00  1.00 0.99  0.99
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.95  1.00  1.00 0.95  0.95
Fnl Sat Adj: 1.00 1.00  1.00  0.95 1.00  0.85  0.95 0.95  1.00  1.00 0.94  0.94
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < <   Actuated   > > > > > > > > > > > > > >
DelAdjFctr:  0.00 0.00  0.00  1.00 0.00  1.00  1.00 1.00  0.00  0.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
```

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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.16	0.00	0.42	0.26	0.69	0.00	0.00	0.43	0.59
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	3.1	0.0	2.2	4.7	1.4	0.0	0.0	6.2	4.5
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	0.8	0.0	0.3	0.8	0.2	0.0	0.0	0.8	0.5
HCM2KQueue:	0.0	0.0	0.0	3.9	0.0	2.4	5.5	1.6	0.0	0.0	7.1	5.0
70th%Factor:	1.20	1.20	1.20	1.19	1.20	1.19	1.19	1.20	1.20	1.20	1.18	1.19
70th%HCM2kQ:	0.0	0.0	0.0	4.7	0.0	2.9	6.6	1.9	0.0	0.0	8.4	5.9
85th%Factor:	1.60	1.60	1.60	1.56	1.60	1.58	1.55	1.58	1.60	1.60	1.54	1.55
85th%HCM2kQ:	0.0	0.0	0.0	6.2	0.0	3.8	8.6	2.5	0.0	0.0	10.8	7.8
90th%Factor:	1.80	1.80	1.80	1.73	1.80	1.75	1.70	1.77	1.80	1.80	1.68	1.71
90th%HCM2kQ:	0.0	0.0	0.0	6.8	0.0	4.2	9.4	2.8	0.0	0.0	11.9	8.6
95th%Factor:	2.10	2.10	2.10	1.98	2.10	2.02	1.94	2.05	2.10	2.10	1.91	1.95
95th%HCM2kQ:	0.0	0.0	0.0	7.8	0.0	4.9	10.8	3.2	0.0	0.0	13.4	9.8
98th%Factor:	2.70	2.70	2.70	2.44	2.70	2.53	2.35	2.59	2.70	2.70	2.28	2.38
98th%HCM2kQ:	0.0	0.0	0.0	9.6	0.0	6.1	13.0	4.0	0.0	0.0	16.1	11.9

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #7: Bruceville / Kaiser Access

Signal=Uncontrol/Rights=Include
Initial Vol: 95 450 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Initial Vol:
115	0		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	100			
	0		Loss Time (sec):	0		0	
0	1!		Critical V/C:	0.000		0	0
	0		Avg Crit Del (sec/veh):	12.8		0	
180	0		Avg Delay (sec/veh):	12.8		0	0
			LOS:	F			

Lanes: 1 0 1 0 0
Initial Vol: 100 570 0
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     100  570    0     0  450   95   115    0  180     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  100  570    0     0  450   95   115    0  180     0    0    0
Added Vol:      0    0    0     0    0    0     0    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:  100  570    0     0  450   95   115    0  180     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   100  570    0     0  450   95   115    0  180     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:   100  570    0     0  450   95   115    0  180     0    0    0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  545 xxxx xxxxx  xxxx xxxx xxxxx  1268 xxxx   273  xxxx xxxx xxxxx
Potent Cap.: 1034 xxxx xxxxx  xxxx xxxx xxxxx   188 xxxx   771  xxxx xxxx xxxxx
Move Cap.:   1034 xxxx xxxxx  xxxx xxxx xxxxx   174 xxxx   771  xxxx xxxx xxxxx
Volume/Cap:  0.10 xxxx  xxxx  xxxx xxxx  xxxx  0.66 xxxx  0.23  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  8.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *    *     *    *    *     *    *    *     *    *    *
Movement:      LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  330 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  8.6 xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 62.5 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *    *     *    *    *     *    F    *     *    *    *
ApproachDel:      xxxxxx           xxxxxx           62.5           xxxxxx
ApproachLOS:        *                *                F               *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:        #120
Dist(miles):       0.000
Speed (mph):        0.00
SignalIndex:       #8
Cycle Time:             0 secs
InitVolume:       0     0
Saturation:       0     0
ArrivalType:      0     0
G/C:           0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:            0.000 0.000
gq1:           0.00  0.00
gq2:           0.00  0.00
gq:            0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:             0.000
beta:              0.000
ta (secs):         0.000
F:                 0.000
f:            0.000 0.000
vcmax:            0     0
vcg:              0     0
vcmin:            0     0
tp:             0.0   0.0
p:                 0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:       0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 545 xxxxx xxxxx    0 xxxxx xxxxx 1268     0   273     0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 545 xxxxx xxxxx    0 xxxxx xxxxx 1268     0   273     0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap: 1034 xxxxx xxxxx  900 xxxxx xxxxx  188   900   771   900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```


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```
PotentCap:  1034 xxxxx xxxxx  900 xxxxx xxxxx  188    900    771  900    900    900
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   100  570     0     0  450    95   115    0   180     0    0     0
ApproachDel:    xxxxxx           xxxxxx             62.5            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=5.1]
   SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=295]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1510]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
               Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   100  570     0     0  450    95   115    0   180     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1215
Minor Approach Volume:            295
Minor Approach Volume Threshold: 218
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 136 501*** 0
Lanes: 0 1 1 0 0

West approach (Signal=Protect, Rights=Overlap):
Initial Vol: 116*** Lanes: 1
Lanes: 0
Initial Vol: 0 Lanes: 0
Lanes: 0
Initial Vol: 167 Lanes: 1

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 12
Critical V/C: 0.360
Avg Crit Del (sec/veh): 21.6
Avg Delay (sec/veh): 16.1
LOS: B

East approach (Signal=Protect, Rights=Include):
Lanes: 0 Initial Vol: 0
Lanes: 0
Lanes: 0 Initial Vol: 0
Lanes: 0
Lanes: 0 Initial Vol: 0

Lanes: 1 0 2 0 0
Initial Vol: 129*** 560 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	5	6	0	0	6	0	4	0	5	0	0	0
Volume Module:												
Base Vol:	129	560	0	0	501	136	116	0	167	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	129	560	0	0	501	136	116	0	167	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	129	560	0	0	501	136	116	0	167	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	129	560	0	0	501	136	116	0	167	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	129	560	0	0	501	136	116	0	167	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	129	560	0	0	501	136	116	0	167	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.57	0.43	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1805	3610	0	0	2748	746	1805	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.07	0.16	0.00	0.00	0.18	0.18	0.06	0.00	0.10	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green/Cycle:	0.20	0.71	0.00	0.00	0.51	0.51	0.18	0.00	0.38	0.00	0.00	0.00
Volume/Cap:	0.36	0.22	0.00	0.00	0.36	0.36	0.36	0.00	0.27	0.00	0.00	0.00
Delay/Veh:	36.6	5.4	0.0	0.0	15.6	15.6	38.2	0.0	22.7	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.6	5.4	0.0	0.0	15.6	15.6	38.2	0.0	22.7	0.0	0.0	0.0
HCM2kAvg:	4	3	0	0	6	6	4	0	4	0	0	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	1 0 2 0 0			0 0 1 1 0			1 0 0 0 1			0 0 0 0 0		
Lane Group:	L	T	xxxx	xxxx	RT	RT	L	xxxx	R	xxxx	xxxx	xxxx
#LnsInGrps:	1	2	0	0	2	2	1	0	1	0	0	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Hev Veh Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Grade Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Parking Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Bus Stp Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Area Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	0.97	0.97	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx
LT Adj:	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	1.00	1.00	0.97	0.97	0.95	1.00	0.85	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fnl Sat Adj:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.20	0.71	0.00	0.00	0.51	0.51	0.18	0.00	0.38	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	3.4	2.8	0.0	0.0	5.5	5.5	3.1	0.0	3.3	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.6	0.3	0.0	0.0	0.6	0.6	0.6	0.0	0.4	0.0	0.0	0.0
HCM2KQueue:	3.9	3.1	0.0	0.0	6.1	6.1	3.6	0.0	3.7	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	4.7	3.7	0.0	0.0	7.2	7.2	4.3	0.0	4.4	0.0	0.0	0.0
85th%Factor:	1.56	1.57	1.60	1.60	1.54	1.54	1.57	1.60	1.56	1.60	1.60	1.60
85th%HCM2kQ:	6.2	4.9	0.0	0.0	9.4	9.4	5.7	0.0	5.8	0.0	0.0	0.0
90th%Factor:	1.73	1.74	1.80	1.80	1.69	1.69	1.73	1.80	1.73	1.80	1.80	1.80
90th%HCM2kQ:	6.8	5.4	0.0	0.0	10.3	10.3	6.3	0.0	6.4	0.0	0.0	0.0
95th%Factor:	1.98	2.01	2.10	2.10	1.93	1.93	1.99	2.10	1.99	2.10	2.10	2.10
95th%HCM2kQ:	7.8	6.2	0.0	0.0	11.8	11.8	7.3	0.0	7.4	0.0	0.0	0.0
98th%Factor:	2.44	2.49	2.70	2.70	2.33	2.33	2.46	2.70	2.45	2.70	2.70	2.70
98th%HCM2kQ:	9.6	7.7	0.0	0.0	14.2	14.2	9.0	0.0	9.1	0.0	0.0	0.0

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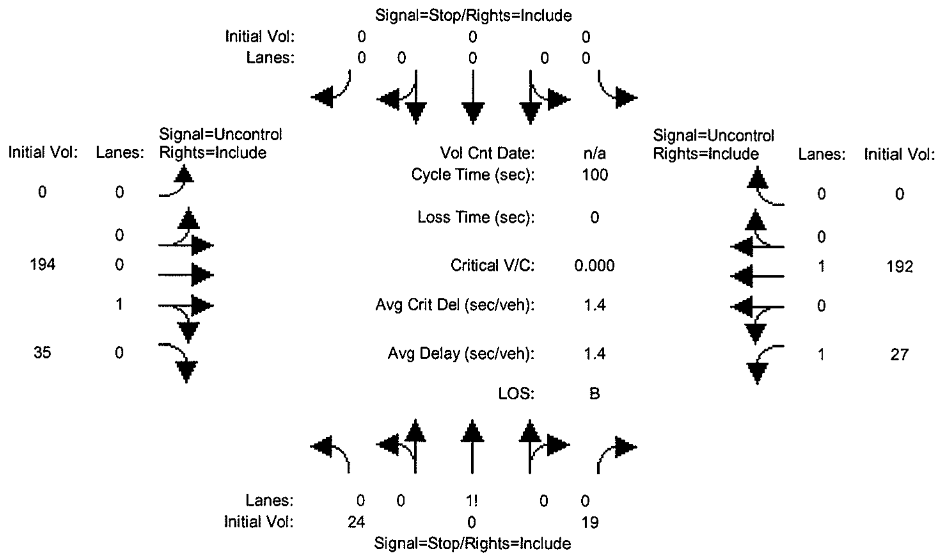
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #9: Arroyo Vista & Wyndham




```
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      24    0    19     0    0     0     0  194    35    27  192     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   24    0    19     0    0     0     0  194    35    27  192     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   24    0    19     0    0     0     0  194    35    27  192     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    24    0    19     0    0     0     0  194    35    27  192     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    24    0    19     0    0     0     0  194    35    27  192     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  458 xxxx   212  xxxx xxxx xxxxx  xxxx xxxx xxxxx   229 xxxx xxxxx
Potent Cap.:  565 xxxx   834  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1351 xxxx xxxxx
Move Cap.:    556 xxxx   834  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1351 xxxx xxxxx
Volume/Cap:  0.04 xxxx  0.02  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  652 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 10.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     *    *     *
ApproachDel:       10.9           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B               *                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:              0%               0%               0%               0%
Grade:               0%               0%               0%               0%
Peds/Hour:           0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                       #26
Dist(miles):                                                      0.000
Speed (mph):                                                       0.00
SignalIndex:                                                      #8
Cycle Time:                                                            0 secs
InitVolume:                                                     0      0
Saturation:                                                     0      0
ArrivalType:                                                    0      0
G/C:                                                         0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                          0.000 0.000
gq1:                                                         0.00  0.00
gq2:                                                         0.00  0.00
gq:                                                          0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                             0.000
beta:                                                              0.000
ta (secs):                                                         0.000
F:                                                                 0.000
f:                                                          0.000 0.000
vcmax:                                                          0      0
vcg:                                                            0      0
vcmin:                                                          0      0
tp:                                                           0.0    0.0
p:                                                                 0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 458     0   212     0     0     0     0 xxxxx xxxxx  229 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol: 458     0   212     0     0     0     0 xxxxx xxxxx  229 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  565   900   834  900   900   900  900 xxxxx xxxxx 1351 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:   565   900   834  900   900   900  900 xxxxx xxxxx 1351 xxxxx xxxxx
                       Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #9 Arroyo Vista & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   1  0  1  0  0
Final Vol.:    24    0    19    0    0     0    0  194    35   27  192     0
ApproachDel:      10.9          xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=43]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=491]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #9 Arroyo Vista & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   1  0  1  0  0
Final Vol.:    24    0    19    0    0     0    0  194    35   27  192     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             448
Minor Approach Volume:            43
Minor Approach Volume Threshold: 561
```


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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #10: Kaiser & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 73 0 85
Lanes: 0 0 1! 0 0

Signal=Uncontrol
Rights=Include

Initial Vol:	Lanes:
17	1
	0
133	1
	0
0	0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 3.7
Avg Delay (sec/veh): 3.7
LOS: B

Signal=Uncontrol
Rights=Include

Lanes:	Initial Vol:
0	46
1	
0	171
0	
0	0

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Stop/Rights=Include

```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0    85     0    73    17   133     0     0   171    46
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0     0     0    85     0    73    17   133     0     0   171    46
Added Vol:      0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    0     0     0    85     0    73    17   133     0     0   171    46
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:     0     0     0    85     0    73    17   133     0     0   171    46
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:     0     0     0    85     0    73    17   133     0     0   171    46
Critical Gap Module:
Critical Gp:xxxxx  xxxx xxxxx   6.4  xxxx   6.2   4.1  xxxx xxxxx xxxxx  xxxx xxxxx
FollowUpTim:xxxxx  xxxx xxxxx   3.5  xxxx   3.3   2.2  xxxx xxxxx xxxxx  xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx  xxxx xxxxx   361  xxxx   194   217  xxxx xxxxx  xxxx  xxxx xxxxx
Potent Cap.: xxxx  xxxx xxxxx   642  xxxx   853  1365  xxxx xxxxx  xxxx  xxxx xxxxx
Move Cap.:   xxxx  xxxx xxxxx   636  xxxx   853  1365  xxxx xxxxx  xxxx  xxxx xxxxx
Volume/Cap:  xxxx  xxxx  xxxx  0.13  xxxx  0.09  0.01  xxxx  xxxx  xxxx  xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   0.0  xxxx xxxxx xxxxx  xxxx xxxxx
Stopped Del:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   7.7  xxxx xxxxx xxxxx  xxxx xxxxx
LOS by Move:    *     *     *     *     *     *     A     *     *     *     *     *
Movement:     LT  - LTR  - RT    LT  - LTR  - RT    LT  - LTR  - RT    LT  - LTR  - RT
Shared Cap.: xxxx  xxxx xxxxx  xxxx   720 xxxxx  xxxx  xxxx xxxxx  xxxx  xxxx xxxxx
SharedQueue:xxxxx  xxxx xxxxx xxxxx   0.8 xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shrd StpDel:xxxxx  xxxx xxxxx xxxxx  11.4 xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shared LOS:     *     *     *     *     B     *     *     *     *     *     *     *
ApproachDel:     xxxxxx            11.4             xxxxxx            xxxxxx
ApproachLOS:        *                B                 *                 *
-----------|----------------|----------------|----------------|----------------|
HevVeh:            0%               0%               0%               0%
Grade:             0%               0%               0%               0%
Peds/Hour:         0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                         #26
Dist(miles):                                                        0.000
Speed (mph):                                                         0.00
SignalIndex:                                                        #8
Cycle Time:                                                              0 secs
InitVolume:                                                       0      0
Saturation:                                                       0      0
ArrivalType:                                                      0      0
G/C:                                                           0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                            0.000  0.000
gq1:                                                           0.00   0.00
gq2:                                                           0.00   0.00
gq:                                                            0.00   0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                               0.000
beta:                                                                0.000
ta (secs):                                                           0.000
F:                                                                   0.000
f:                                                            0.000  0.000
vcmax:                                                            0      0
vcg:                                                              0      0
vcmin:                                                            0      0
tp:                                                             0.0    0.0
p:                                                                   0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:    0     0     0   361     0   194   217 xxxxx xxxxx     0 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000  1.00 1.000 1.000  1.00 x.xxx x.xxx  1.00 x.xxx x.xxx
ConflictVol:    0     0     0   361     0   194   217 xxxxx xxxxx     0 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:   900   900   900   642   900   853  1365 xxxxx xxxxx   900 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000  1.00 1.000 1.000  1.00 x.xxx x.xxx  1.00 x.xxx x.xxx
```

```
PotentCap:   900   900   900  642   900   853 1365 xxxxx xxxxx  900 xxxxx xxxxx
                      Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Lanes:        0  0  0  0  0     0  0  1! 0  0     1  0  1  0  0     0  0  0  1  0
Final Vol.:     0    0    0     85    0    73     17  133     0      0  171    46
ApproachDel:    xxxxxx              11.4             xxxxxx            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=158]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=525]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Lanes:        0  0  0  0  0     0  0  1! 0  0     1  0  1  0  0     0  0  0  1  0
Final Vol.:     0    0    0     85    0    73     17  133     0      0  171    46
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             367
Minor Approach Volume:           158
Minor Approach Volume Threshold: 630
```

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.97	0.95	1.00	0.97	0.95	0.95	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	1.00	0.85	1.00	1.00	0.85	1.00	0.98	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	5085	1562	3433	3539	1562	3433	1722	1483	3433	3539	1562
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	5085	1562	3433	3539	1562	3433	1722	1483	3433	3539	1562
Volume (vph)	81	627	37	614	797	315	38	270	515	448	300	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	81	627	37	614	797	315	38	270	515	448	300	30
RTOR Reduction (vph)	0	0	24	0	0	158	0	4	274	0	0	18
Lane Group Flow (vph)	81	627	13	614	797	157	38	319	188	448	300	12
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	5.5	18.4	18.4	22.2	35.1	35.1	3.2	23.7	23.7	17.0	37.5	37.5
Effective Green, g (s)	5.0	19.1	19.1	21.7	35.8	35.8	2.2	24.4	24.4	16.0	38.2	38.2
Actuated g/C Ratio	0.05	0.20	0.20	0.22	0.37	0.37	0.02	0.25	0.25	0.16	0.39	0.39
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	177	999	307	766	1303	575	78	432	372	565	1391	614
v/s Ratio Prot	0.02	0.12		c0.18	c0.23		0.01	c0.18		c0.13	0.08	
v/s Ratio Perm			0.01			0.10			0.13			0.01
v/c Ratio	0.46	0.63	0.04	0.80	0.61	0.27	0.49	0.74	0.51	0.79	0.22	0.02
Uniform Delay, d1	44.8	35.8	31.6	35.7	25.0	21.6	46.9	33.5	31.2	39.0	19.6	18.0
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	0.7	0.9	0.0	5.7	0.6	0.1	1.7	5.6	0.4	7.0	0.0	0.0
Delay (s)	45.5	36.7	31.7	41.4	25.6	21.7	48.7	39.0	31.6	46.0	19.6	18.0
Level of Service	D	D	C	D	C	C	D	D	C	D	B	B
Approach Delay (s)		37.4			30.5			35.3			34.8	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	97.2	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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	1287	303	0	1258	891	0	0	0	1115	0	535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1287	303	0	1258	891	0	0	0	1115	0	535
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	35
Lane Group Flow (vph)	0	1287	303	0	1258	891	0	0	0	1115	0	500
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		56.1	100.0		55.9	100.0				33.7		33.7
Effective Green, g (s)		57.1	100.0		57.1	100.0				34.9		34.9
Actuated g/C Ratio		0.57	1.00		0.57	1.00				0.35		0.35
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2904	1583		2904	2787				1198		552
v/s Ratio Prot		c0.25			0.25							
v/s Ratio Perm			0.19			0.32				c0.32		0.32
v/c Ratio		0.44	0.19		0.43	0.32				0.93		0.91
Uniform Delay, d1		12.3	0.0		12.2	0.0				31.4		31.0
Progression Factor		1.00	1.00		0.79	1.00				1.00		1.00
Incremental Delay, d2		0.5	0.3		0.4	0.3				12.6		18.0
Delay (s)		12.8	0.3		10.1	0.3				44.0		49.0
Level of Service		B	A		B	A				D		D
Approach Delay (s)		10.4			6.0			0.0			45.6	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	1802	500	0	1814	501	335	0	401	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1802	500	0	1814	501	335	0	401	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	39	0	0	0
Lane Group Flow (vph)	0	1802	500	0	1814	501	335	0	362	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		73.7	100.0		74.0	100.0	15.7		15.7			
Effective Green, g (s)		75.0	100.0		75.0	100.0	17.0		17.0			
Actuated g/C Ratio		0.75	1.00		0.75	1.00	0.17		0.17			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3814	1550		3814	2787	584		474			
v/s Ratio Prot		0.35			c0.36							
v/s Ratio Perm			0.32			0.18	0.10		c0.13			
v/c Ratio		0.47	0.32		0.48	0.18	0.57		0.76			
Uniform Delay, d1		4.8	0.0		4.9	0.0	38.2		39.6			
Progression Factor		1.07	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.3	0.4		0.4	0.1	0.9		6.5			
Delay (s)		5.5	0.4		5.3	0.1	39.0		46.1			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		4.4			4.2			42.9			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
Existing PM

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 700*** 490 398
Lanes: 1 0 2 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
506	2		Vol Cnt Date:	n/a		1	177
	0		Cycle Time (sec):	100		0	
1853***	3		Loss Time (sec):	16		3	1239
	0		Critical V/C:	1.016		0	
559	1		Avg Crit Del (sec/veh):	146.9		2	171***
			Avg Delay (sec/veh):	106.4			
			LOS:	F			

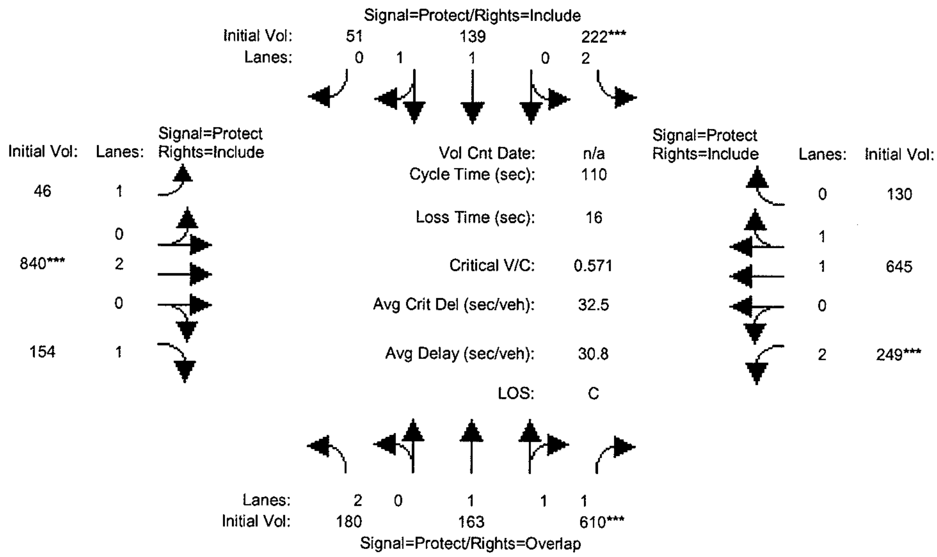
Lanes: 2 0 2 0 1
Initial Vol: 478*** 274 158
Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	478	274	158	398	490	700	506	1853	559	171	1239	177
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	478	274	158	398	490	700	506	1853	559	171	1239	177
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	478	274	158	398	490	700	506	1853	559	171	1239	177
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	478	274	158	398	490	700	506	1853	559	171	1239	177
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	478	274	158	398	490	700	506	1853	559	171	1239	177
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	526	274	158	438	490	700	557	1853	559	188	1239	177
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.19	0.10	0.11	0.16	0.18	0.51	0.20	0.45	0.41	0.07	0.30	0.13
Crit Vol:	263					700		618		94		
Crit Moves:	****					****		****		****		

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline AM

Intersection #1: Valley Hi & Mack



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	10	0	4	6	0	4	26	0	4	30	0
Volume Module:												
Base Vol:	180	163	610	222	139	51	46	840	154	249	645	130
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	163	610	222	139	51	46	840	154	249	645	130
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	180	163	610	222	139	51	46	840	154	249	645	130
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	180	163	610	222	139	51	46	840	154	249	645	130
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	180	163	610	222	139	51	46	840	154	249	645	130
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	180	163	610	222	139	51	46	840	154	249	645	130
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.84	0.84	0.92	0.91	0.91	0.95	0.95	0.85	0.92	0.93	0.93
Lanes:	2.00	1.00	2.00	2.00	1.46	0.54	1.00	2.00	1.00	2.00	1.66	0.34
Final Sat.:	3502	1592	3184	3502	2535	930	1805	3610	1615	3502	2929	590
Capacity Analysis Module:												
Vol/Sat:	0.05	0.10	0.19	0.06	0.05	0.05	0.03	0.23	0.10	0.07	0.22	0.22
Crit Moves:			****	****				****		****		
Green/Cycle:	0.16	0.21	0.34	0.11	0.17	0.17	0.06	0.41	0.41	0.12	0.47	0.47
Volume/Cap:	0.33	0.48	0.57	0.57	0.33	0.33	0.41	0.57	0.23	0.57	0.47	0.47
Delay/Veh:	41.7	38.4	30.6	48.4	40.8	40.8	52.0	25.7	21.5	47.2	20.0	20.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.7	38.4	30.6	48.4	40.8	40.8	52.0	25.7	21.5	47.2	20.0	20.0
HCM2kAvg:	3	5	9	5	3	3	2	11	3	5	9	9
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	2 0 1 1 1			2 0 1 1 0			1 0 2 0 1			2 0 1 1 0		
Lane Group:	L	RT	RT	L	RT	RT	L	T	R	L	RT	RT
#LnsInGrps:	2	3	3	2	2	2	1	2	1	2	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	xxxx	0.88	0.88	xxxx	0.96	0.96	xxxx	xxxx	0.85	xxxx	0.98	0.98
LT Adj:	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	0.88	0.88	0.95	0.96	0.96	0.95	1.00	0.85	0.95	0.98	0.98
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	0.95
Fnl Sat Adj:	0.92	0.84	0.84	0.92	0.91	0.91	0.95	0.95	0.85	0.92	0.93	0.93
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > >											
Street Type:		Main			Main			Side			Side	
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.16	0.21	0.34	0.11	0.17	0.17	0.06	0.41	0.41	0.12	0.47	0.47
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	2.6	4.4	7.7	3.4	2.6	2.6	1.4	9.9	3.1	3.8	8.1	8.1
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.5	0.9	1.3	1.2	0.5	0.5	0.6	1.3	0.3	1.2	0.9	0.9
HCM2KQueue:	3.1	5.3	8.9	4.6	3.0	3.0	2.1	11.2	3.4	5.0	8.9	8.9
70th%Factor:	1.19	1.19	1.18	1.19	1.19	1.19	1.19	1.18	1.19	1.19	1.18	1.18
70th%HCM2kQ:	3.6	6.3	10.5	5.5	3.6	3.6	2.5	13.2	4.0	5.9	10.5	10.5
85th%Factor:	1.57	1.55	1.52	1.56	1.57	1.57	1.58	1.51	1.57	1.55	1.52	1.52
85th%HCM2kQ:	4.8	8.2	13.6	7.1	4.8	4.8	3.3	16.9	5.3	7.7	13.6	13.6
90th%Factor:	1.74	1.71	1.66	1.72	1.74	1.74	1.76	1.63	1.74	1.71	1.66	1.66
90th%HCM2kQ:	5.3	9.0	14.8	7.9	5.3	5.3	3.6	18.2	5.9	8.5	14.8	14.8
95th%Factor:	2.01	1.95	1.87	1.97	2.01	2.01	2.04	1.82	2.00	1.95	1.87	1.87
95th%HCM2kQ:	6.1	10.3	16.7	9.0	6.1	6.1	4.2	20.4	6.8	9.7	16.6	16.6
98th%Factor:	2.49	2.37	2.20	2.40	2.49	2.49	2.55	2.12	2.47	2.38	2.20	2.20
98th%HCM2kQ:	7.6	12.5	19.7	11.0	7.6	7.6	5.3	23.8	8.4	11.9	19.7	19.7

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline AM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Include
Initial Vol: 356*** 0 0
Lanes: 2 0 0 0 0

Signal=Protect Rights=Ignore (Eastbound) — Initial Vol: / Lanes:
0 0
0
1553*** 2
0
165 1

Vol Cnt Date: n/a
Cycle Time (sec): 60
Loss Time (sec): 4
Critical V/C: 0.771
Avg Crit Del (sec/veh): 12.3
Avg Delay (sec/veh): 9.9
LOS: A

Signal=Protect Rights=Include (Westbound) — Lanes: / Initial Vol:
0 0
0
2 686
0
1 296***

Lanes: 0 0 0 0 1
Initial Vol: 0 0 768
Signal=Protect/Rights=Ignore

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	768	0	0	356	0	1553	165	296	686	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	768	0	0	356	0	1553	165	296	686	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	768	0	0	356	0	1553	165	296	686	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	356	0	1553	0	296	686	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	356	0	1553	0	296	686	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	356	0	1553	0	296	686	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.43	0.00	0.16	0.19	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.59	0.00	0.82	0.25	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	27.2	0.0	4.2	0.0	36.8	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	27.2	0.0	4.2	0.0	36.8	2.4	0.0
HCM2kAvg:	0	0	0	0	0	5	0	8	0	8	2	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0	0 0	1	0 0	0 0	2	0 0	2 0	1	1 0	2 0	0
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > >											
Street Type:		Main			Main			Side			Side	
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method

Future Volume Alternative

Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	2.8	0.0	6.1	0.0	5.0	1.8	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	1.9	0.0	1.4	0.0	3.3	0.3	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	4.7	0.0	7.5	0.0	8.3	2.1	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.19	1.20	1.18	1.20	1.18	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	5.6	0.0	8.9	0.0	9.8	2.5	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.56	1.60	1.53	1.60	1.53	1.58	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	7.3	0.0	11.6	0.0	12.6	3.3	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.72	1.80	1.67	1.80	1.66	1.76	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	8.1	0.0	12.6	0.0	13.7	3.7	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.96	2.10	1.89	2.10	1.88	2.03	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	9.2	0.0	14.3	0.0	15.5	4.3	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.40	2.70	2.26	2.70	2.23	2.55	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	11.2	0.0	17.0	0.0	18.4	5.4	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline AM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Overlap
Initial Vol: 40 376 176***
Lanes: 1 0 2 0 1

Initial Vol:	Lanes:	Signal=Split Rights=Overlap			Signal=Split Rights=Overlap	Lanes:	Initial Vol:
			Vol Cnt Date:	n/a			
			Cycle Time (sec):	90			
60	1					2	218
	0		Loss Time (sec):	16		0	
41***	1!		Critical V/C:	0.440		0	49***
	0		Avg Crit Del (sec/veh):	25.2		1	
9	0		Avg Delay (sec/veh):	21.7		1	74
			LOS:	C			

Lanes: 1 0 2 0 1
Initial Vol: 21 677*** 141
Signal=Protect/Rights=Overlap

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4    4    0     6    6    0     0    4    0     0    4    0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     21  677   141   176  376    40    60   41     9    74   49   218
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  21  677   141   176  376    40    60   41     9    74   49   218
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  21  677   141   176  376    40    60   41     9    74   49   218
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   21  677   141   176  376    40    60   41     9    74   49   218
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  21  677   141   176  376    40    60   41     9    74   49   218
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   21  677   141   176  376    40    60   41     9    74   49   218
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
Lanes:      1.00 2.00  1.00  1.00 2.00  1.00  1.38 0.51  0.11  1.20 0.80  2.00
Final Sat.: 1805 3610  1615  1805 3610  1615  2511  936   205  2220 1470  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.01 0.19  0.09  0.10 0.10  0.02  0.02 0.04  0.04  0.03 0.03  0.08
Crit Moves:      ****        ****                  ****             ****
Green/Cycle: 0.19 0.43  0.50  0.22 0.45  0.55  0.10 0.10  0.29  0.08 0.08  0.30
Volume/Cap: 0.06 0.44  0.17  0.44 0.23  0.04  0.24 0.44  0.15  0.44 0.44  0.26
Delay/Veh:  29.7 18.5  12.4  31.0 15.1   9.2  37.7 39.4  23.6  40.9 40.9  24.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 29.7 18.5  12.4  31.0 15.1   9.2  37.7 39.4  23.6  40.9 40.9  24.2
HCM2kAvg:      1    7     2     5    3     1     1    3     2     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        1  0  2  0  1    1  0  2  0  1    1  0  1!  0  0    1  1  0  0  2
Lane Group:    L    T     R     L    T     R   LTR  LTR   LTR    LT   LT     R
#LnsInGrps:    1    2     1     1    2     1     2    1     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid       8                8                8                8
% Hev Veh:         0                0                0                0
Grade:            0%               0%               0%               0%
Parking/Hr:       No               No               No               No
Bus Stp/Hr:        0                0                0                0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:       0                0                0                0
ExclusiveRT:   Include          Include          Include          Include
% RT Prtct:        0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx     1 xxxx  xxxx     4    4     4     4    4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Area Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:     xxxx xxxx  0.85  xxxx xxxx  0.85  0.99 0.99  0.99  xxxx xxxx  0.85
LT Adj:     0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.97 0.97  0.97  0.97 0.97 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95 1.00  0.85  0.96 0.96  0.96  0.97 0.97  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  1.00  1.00 1.00  1.00  1.00 1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < <   Actuated    > > > > > > > > > > > > > >
DelAdjFctr: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
```

Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.19	0.43	0.50	0.22	0.45	0.55	0.10	0.10	0.29	0.08	0.08	0.30
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.5	6.0	1.9	4.0	2.9	0.5	1.0	1.9	1.5	1.5	1.5	2.1
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	0.8	0.2	0.8	0.3	0.0	0.3	0.7	0.2	0.7	0.7	0.3
HCM2KQueue:	0.5	6.8	2.1	4.8	3.2	0.5	1.3	2.7	1.7	2.2	2.2	2.4
70th%Factor:	1.20	1.18	1.19	1.19	1.19	1.20	1.20	1.19	1.20	1.19	1.19	1.19
70th%HCM2kQ:	0.6	8.0	2.6	5.7	3.8	0.6	1.6	3.2	2.0	2.7	2.7	2.9
85th%Factor:	1.59	1.54	1.58	1.56	1.57	1.59	1.59	1.57	1.58	1.58	1.58	1.58
85th%HCM2kQ:	0.8	10.4	3.4	7.4	5.0	0.8	2.1	4.2	2.7	3.5	3.5	3.8
90th%Factor:	1.79	1.69	1.76	1.72	1.74	1.79	1.77	1.75	1.77	1.76	1.76	1.75
90th%HCM2kQ:	0.9	11.4	3.8	8.2	5.5	0.9	2.4	4.7	3.0	4.0	4.0	4.2
95th%Factor:	2.08	1.91	2.03	1.96	2.00	2.08	2.06	2.02	2.05	2.03	2.03	2.02
95th%HCM2kQ:	1.1	12.9	4.3	9.3	6.3	1.1	2.8	5.4	3.5	4.6	4.6	4.9
98th%Factor:	2.66	2.29	2.55	2.39	2.48	2.66	2.60	2.51	2.58	2.54	2.54	2.53
98th%HCM2kQ:	1.4	15.5	5.4	11.4	7.9	1.3	3.5	6.7	4.4	5.7	5.7	6.1

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline AM

Intersection #4: Valley Hi & Wyndham

```
                                   Signal=Uncontrol/Rights=Include
                     Initial Vol:     0         408          85
                           Lanes:     0    0     2       0    1

                  Signal=Stop                                          Signal=Stop
Initial Vol: Lanes: Rights=Include           Vol Cnt Date:   n/a       Rights=Include    Lanes: Initial Vol:
                                           Cycle Time (sec):  100
     0        0                                                                          1       104
                                            Loss Time (sec):   0
              0                                                                          0
     0        0                               Critical V/C:  0.000                       0         0
              0                        Avg Crit Del (sec/veh):   2.2                     0
     0        0                             Avg Delay (sec/veh):  2.2                    1        36
                                                       LOS:     C

                           Lanes:     0    0     1       1    0
                     Initial Vol:     0         710          61
                                   Signal=Uncontrol/Rights=Include
```

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  710    61    85  408     0     0    0     0    36    0   104
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  710    61    85  408     0     0    0     0    36    0   104
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0  710    61    85  408     0     0    0     0    36    0   104
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  710    61    85  408     0     0    0     0    36    0   104
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  710    61    85  408     0     0    0     0    36    0   104
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   771 xxxx xxxxx  xxxx xxxx xxxxx  1115 xxxx   386
Potent Cap.: xxxx xxxx xxxxx   853 xxxx xxxxx  xxxx xxxx xxxxx   205 xxxx   619
Move Cap.:   xxxx xxxx xxxxx   853 xxxx xxxxx  xxxx xxxx xxxxx   190 xxxx   619
Volume/Cap:  xxxx xxxx  xxxx  0.10 xxxx  xxxx  xxxx xxxx  xxxx  0.19 xxxx  0.17
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.3 xxxx xxxxx xxxxx xxxx xxxxx   0.7 xxxx   0.6
Stopped Del:xxxxx xxxx xxxxx   9.7 xxxx xxxxx xxxxx xxxx xxxxx  28.4 xxxx  12.0
LOS by Move:    *    *     *     A    *     *     *    *     *     D    *     B
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            16.2
ApproachLOS:        *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                          #5
Dist(miles):                         0.000
Speed (mph):                          0.00
SignalIndex:                         #3
Cycle Time:                             0 secs
InitVolume:                        0     0
Saturation:                        0     0
ArrivalType:                       0     0
G/C:                            0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                             0.000 0.000
gq1:                            0.00  0.00
gq2:                            0.00  0.00
gq:                             0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                               0.000
beta:                                0.000
ta (secs):                           0.000
F:                                   0.000
f:                             0.000 0.000
vcmax:                             0     0
vcg:                               0     0
vcmin:                             0     0
tp:                              0.0   0.0
p:                                   0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:       0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:    0 xxxxx xxxxx  771 xxxxx xxxxx    0     0     0 1115     0   386
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:    0 xxxxx xxxxx  771 xxxxx xxxxx    0     0     0 1115     0   386
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:   900 xxxxx xxxxx  853 xxxxx xxxxx  900   900   900  205   900   619
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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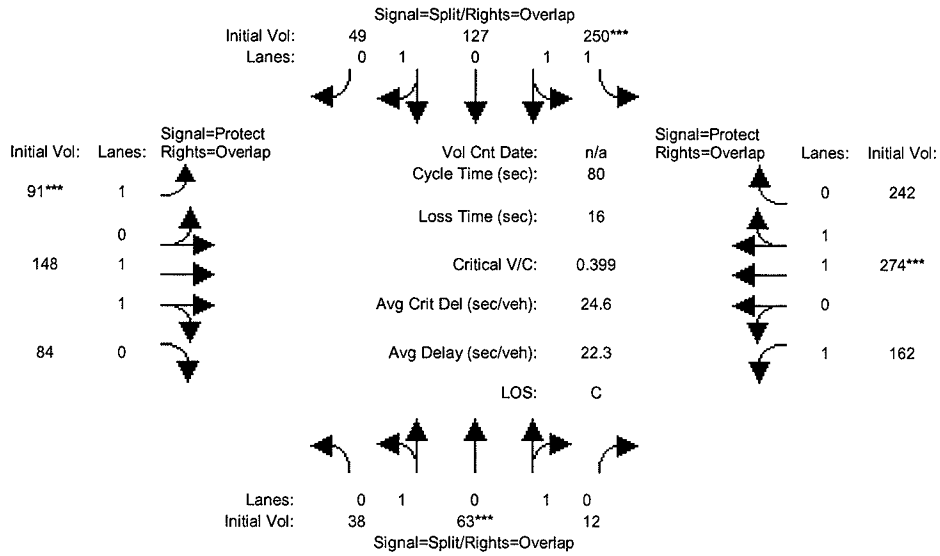
```
PotentCap:    900 xxxxx xxxxx  853 xxxxx xxxxx  900    900    900  205    900    619
                          Peak Hour Delay Signal Warrant Report
*********************************************************************************
Intersection #4 Valley Hi & Wyndham
*********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled        Stop Sign         Stop Sign
Lanes:          0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:      0  710    61     85  408     0     0     0     0     36    0   104
ApproachDel:      xxxxxx            xxxxxx            xxxxxx              16.2
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=140]
   FAIL - Approach volume less than 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1404]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                     Peak Hour Volume Signal Warrant Report [Urban]
*********************************************************************************
Intersection #4 Valley Hi & Wyndham
*********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled        Stop Sign         Stop Sign
Lanes:          0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:      0  710    61     85  408     0     0     0     0     36    0   104
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1264
Minor Approach Volume:            140
Minor Approach Volume Threshold: 273
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline AM

Intersection #5: Alta Valley & Bruceville



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	38	63	12	250	127	49	91	148	84	162	274	242
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	38	63	12	250	127	49	91	148	84	162	274	242
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	38	63	12	250	127	49	91	148	84	162	274	242
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	38	63	12	250	127	49	91	148	84	162	274	242
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	38	63	12	250	127	49	91	148	84	162	274	242
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	38	63	12	250	127	49	91	148	84	162	274	242
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.90	0.90	0.95	0.88	0.88
Lanes:	0.67	1.12	0.21	1.76	0.89	0.35	1.00	1.28	0.72	1.00	1.06	0.94
Final Sat.:	1174	1947	371	3033	1541	595	1805	2179	1236	1805	1783	1575
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.03	0.08	0.08	0.08	0.05	0.07	0.07	0.09	0.15	0.15
Crit Moves:		****		****			****				****	
Green/Cycle:	0.08	0.08	0.36	0.21	0.21	0.33	0.13	0.23	0.31	0.28	0.39	0.59
Volume/Cap:	0.40	0.40	0.09	0.40	0.40	0.25	0.40	0.29	0.22	0.32	0.40	0.26
Delay/Veh:	35.8	35.8	17.0	27.7	27.7	19.5	33.3	25.4	20.3	23.2	18.0	7.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.8	35.8	17.0	27.7	27.7	19.5	33.3	25.4	20.3	23.2	18.0	7.9
HCM2kAvg:	2	2	1	3	3	3	3	3	2	3	5	3
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 1 0 1 0			1 1 0 1 0			1 0 1 1 0			1 0 1 1 0		
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.98	0.98	0.98	0.98	0.98	0.98	xxxx	0.95	0.95	xxxx	0.93	0.93
LT Adj:	0.98	0.98	0.98	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.97	0.97	0.97	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.90	0.90	0.95	0.88	0.88
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.08	0.08	0.36	0.21	0.21	0.33	0.13	0.23	0.31	0.28	0.39	0.59
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	1.2	1.2	0.8	2.8	2.8	2.4	2.0	2.1	1.9	3.0	4.2	2.8
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.6	0.6	0.1	0.6	0.6	0.3	0.6	0.4	0.3	0.5	0.7	0.3
HCM2KQueue:	1.8	1.8	0.9	3.5	3.5	2.7	2.6	2.5	2.2	3.5	4.8	3.1
70th%Factor:	1.20	1.20	1.20	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	2.2	2.2	1.1	4.1	4.1	3.2	3.1	3.0	2.6	4.1	5.7	3.7
85th%Factor:	1.58	1.58	1.59	1.57	1.57	1.57	1.58	1.58	1.58	1.57	1.56	1.57
85th%HCM2kQ:	2.9	2.9	1.5	5.4	5.4	4.2	4.1	4.0	3.4	5.4	7.5	4.9
90th%Factor:	1.76	1.76	1.78	1.74	1.74	1.75	1.75	1.75	1.76	1.74	1.71	1.74
90th%HCM2kQ:	3.2	3.2	1.7	6.0	6.0	4.7	4.6	4.4	3.8	6.0	8.3	5.4
95th%Factor:	2.04	2.04	2.07	2.00	2.00	2.02	2.02	2.02	2.03	1.99	1.96	2.00
95th%HCM2kQ:	3.8	3.8	2.0	6.9	6.9	5.4	5.2	5.1	4.4	6.9	9.4	6.2
98th%Factor:	2.57	2.57	2.63	2.47	2.47	2.51	2.52	2.52	2.55	2.47	2.39	2.49
98th%HCM2kQ:	4.7	4.7	2.5	8.5	8.5	6.8	6.5	6.4	5.5	8.6	11.5	7.7

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline AM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Protect/Rights=Include

Initial Vol: 222 0 295***
Lanes: 1 0 0 0 1

Initial Vol: Lanes: Signal=Protect Rights=Include

138*** 1
0
271 2
0
0 0

Vol Cnt Date: n/a
Cycle Time (sec): 90
Loss Time (sec): 14
Critical V/C: 0.442
Avg Crit Del (sec/veh): 25.7
Avg Delay (sec/veh): 22.6
LOS: C

Signal=Protect Rights=Include Lanes: Initial Vol:

0 11
1
1 469***
0
0 0

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	4	0	0	4	6	0	0	6	0
Volume Module:												
Base Vol:	0	0	0	295	0	222	138	271	0	0	469	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	295	0	222	138	271	0	0	469	11
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	295	0	222	138	271	0	0	469	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	295	0	222	138	271	0	0	469	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	295	0	222	138	271	0	0	469	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	295	0	222	138	271	0	0	469	11
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.95	0.95
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.95	0.05
Final Sat.:	0	0	0	1805	0	1615	1805	3610	0	0	3517	82
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.16	0.00	0.14	0.08	0.08	0.00	0.00	0.13	0.13
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.37	0.00	0.37	0.17	0.47	0.00	0.00	0.30	0.30
Volume/Cap:	0.00	0.00	0.00	0.44	0.00	0.37	0.44	0.16	0.00	0.00	0.44	0.44
Delay/Veh:	0.0	0.0	0.0	21.8	0.0	21.1	34.3	13.5	0.0	0.0	25.6	25.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	21.8	0.0	21.1	34.3	13.5	0.0	0.0	25.6	25.6
HCM2kAvg:	0	0	0	7	0	5	4	2	0	0	6	6
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Lane Group:	xxxx	xxxx	xxxx	L	xxxx	R	L	T	xxxx	xxxx	RT	RT
#LnsInGrps:	0	0	0	1	0	1	1	2	0	0	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Hev Veh Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Grade Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Area Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	1.00	1.00
LT Adj:	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Fnl Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.95	0.95
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.37	0.00	0.37	0.17	0.47	0.00	0.00	0.30	0.30
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	5.8	0.0	4.1	3.3	1.9	0.0	0.0	4.8	4.8
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	0.8	0.0	0.6	0.8	0.2	0.0	0.0	0.8	0.8
HCM2KQueue:	0.0	0.0	0.0	6.6	0.0	4.6	4.0	2.1	0.0	0.0	5.6	5.6
70th%Factor:	1.20	1.20	1.20	1.18	1.20	1.19	1.19	1.19	1.20	1.20	1.19	1.19
70th%HCM2kQ:	0.0	0.0	0.0	7.9	0.0	5.5	4.8	2.5	0.0	0.0	6.7	6.7
85th%Factor:	1.60	1.60	1.60	1.54	1.60	1.56	1.56	1.58	1.60	1.60	1.55	1.55
85th%HCM2kQ:	0.0	0.0	0.0	10.2	0.0	7.2	6.3	3.3	0.0	0.0	8.7	8.7
90th%Factor:	1.80	1.80	1.80	1.69	1.80	1.72	1.73	1.76	1.80	1.80	1.70	1.70
90th%HCM2kQ:	0.0	0.0	0.0	11.2	0.0	8.0	6.9	3.7	0.0	0.0	9.6	9.6
95th%Factor:	2.10	2.10	2.10	1.92	2.10	1.96	1.98	2.03	2.10	2.10	1.94	1.94
95th%HCM2kQ:	0.0	0.0	0.0	12.7	0.0	9.1	8.0	4.3	0.0	0.0	10.9	10.9
98th%Factor:	2.70	2.70	2.70	2.30	2.70	2.40	2.43	2.55	2.70	2.70	2.35	2.35
98th%HCM2kQ:	0.0	0.0	0.0	15.2	0.0	11.1	9.8	5.4	0.0	0.0	13.2	13.2

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline AM

Intersection #7: Bruceville / Kaiser Access

Signal=Uncontrol/Rights=Include
Initial Vol: 135 436 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Initial Vol:
30	0		Cycle Time (sec):	100		0	0
	0		Loss Time (sec):	0		0	
0	1!		Critical V/C:	0.000		0	0
	0		Avg Crit Del (sec/veh):	3.2		0	
70	0		Avg Delay (sec/veh):	3.2		0	0
			LOS:	C			

Vol Cnt Date: n/a

Lanes: 1 0 1 0 0
Initial Vol: 220 520 0
Signal=Uncontrol/Rights=Include

```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     220  520    0     0  436  135    30    0   70     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  220  520    0     0  436  135    30    0   70     0    0    0
Added Vol:      0    0    0     0    0    0     0    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:  220  520    0     0  436  135    30    0   70     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   220  520    0     0  436  135    30    0   70     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:   220  520    0     0  436  135    30    0   70     0    0    0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  571 xxxx xxxxx  xxxx xxxx xxxxx  1464 xxxx   286  xxxx xxxx xxxxx
Potent Cap.: 1012 xxxx xxxxx  xxxx xxxx xxxxx   143 xxxx   758  xxxx xxxx xxxxx
Move Cap.:   1012 xxxx xxxxx  xxxx xxxx xxxxx   119 xxxx   758  xxxx xxxx xxxxx
Volume/Cap:  0.22 xxxx  xxxx  xxxx xxxx  xxxx  0.25 xxxx  0.09  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  9.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  290 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.5 xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 23.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            23.8            xxxxxx
ApproachLOS:        *                *                C                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:         #120
Dist(miles):        0.000
Speed (mph):         0.00
SignalIndex:        #8
Cycle Time:            0 secs
InitVolume:       0     0
Saturation:       0     0
ArrivalType:      0     0
G/C:           0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:            0.000 0.000
gq1:           0.00  0.00
gq2:           0.00  0.00
gq:            0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:              0.000
beta:               0.000
ta (secs):          0.000
F:                  0.000
f:            0.000 0.000
vcmax:            0     0
vcg:              0     0
vcmin:            0     0
tp:             0.0   0.0
p:                  0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:       0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 571 xxxxx xxxxx    0 xxxxx xxxxx 1464    0   286    0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 571 xxxxx xxxxx    0 xxxxx xxxxx 1464    0   286    0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap: 1012 xxxxx xxxxx  900 xxxxx xxxxx  143   900   758  900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:  1012 xxxxx xxxxx  900 xxxxx xxxxx  143   900   758  900   900   900
                      Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #7 Bruceville / Kaiser Access
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   220  520    0      0  436   135   30    0    70     0    0     0
ApproachDel:     xxxxxx           xxxxxx             23.8            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=100]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1411]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                 Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #7 Bruceville / Kaiser Access
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   220  520    0      0  436   135   30    0    70     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:           1311
Minor Approach Volume:          100
Minor Approach Volume Threshold: 192
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline AM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 103 397*** 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Include	Lanes:	Initial Vol:
68***	1		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	104			
	0		Loss Time (sec):	12		0	
0	0		Critical V/C:	0.338		0	0
	0		Avg Crit Del (sec/veh):	23.7		0	
126	1		Avg Delay (sec/veh):	14.4		0	0
			LOS:	B			

Lanes: 1 0 2 0 0
Initial Vol: 214*** 680 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	5	6	0	0	6	0	4	0	5	0	0	0
Volume Module:												
Base Vol:	214	680	0	0	397	103	68	0	126	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	214	680	0	0	397	103	68	0	126	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	214	680	0	0	397	103	68	0	126	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	214	680	0	0	397	103	68	0	126	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	214	680	0	0	397	103	68	0	126	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	214	680	0	0	397	103	68	0	126	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.59	0.41	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1805	3610	0	0	2777	721	1805	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.12	0.19	0.00	0.00	0.14	0.14	0.04	0.00	0.08	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green/Cycle:	0.35	0.77	0.00	0.00	0.42	0.42	0.11	0.00	0.46	0.00	0.00	0.00
Volume/Cap:	0.34	0.24	0.00	0.00	0.34	0.34	0.34	0.00	0.17	0.00	0.00	0.00
Delay/Veh:	25.2	3.3	0.0	0.0	20.4	20.4	43.7	0.0	16.4	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	3.3	0.0	0.0	20.4	20.4	43.7	0.0	16.4	0.0	0.0	0.0
HCM2kAvg:	5	3	0	0	5	5	2	0	2	0	0	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	1 0 2 0 0			0 0 1 1 0			1 0 0 0 1			0 0 0 0 0		
Lane Group:	L	T	xxxx	xxxx	RT	RT	L	xxxx	R	xxxx	xxxx	xxxx
#LnsInGrps:	1	2	0	0	2	2	1	0	1	0	0	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Hev Veh Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Grade Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Parking Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Bus Stp Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Area Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	0.97	0.97	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx
LT Adj:	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	1.00	1.00	0.97	0.97	0.95	1.00	0.85	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fnl Sat Adj:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.35	0.77	0.00	0.00	0.42	0.42	0.11	0.00	0.46	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.8	2.7	0.0	0.0	4.9	4.9	1.9	0.0	2.1	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.5	0.3	0.0	0.0	0.5	0.5	0.5	0.0	0.2	0.0	0.0	0.0
HCM2KQueue:	5.3	3.1	0.0	0.0	5.4	5.4	2.4	0.0	2.3	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	6.3	3.7	0.0	0.0	6.4	6.4	2.9	0.0	2.8	0.0	0.0	0.0
85th%Factor:	1.55	1.57	1.60	1.60	1.55	1.55	1.58	1.60	1.58	1.60	1.60	1.60
85th%HCM2kQ:	8.2	4.8	0.0	0.0	8.3	8.3	3.8	0.0	3.7	0.0	0.0	0.0
90th%Factor:	1.71	1.74	1.80	1.80	1.71	1.71	1.75	1.80	1.76	1.80	1.80	1.80
90th%HCM2kQ:	9.0	5.3	0.0	0.0	9.2	9.2	4.2	0.0	4.1	0.0	0.0	0.0
95th%Factor:	1.95	2.01	2.10	2.10	1.95	1.95	2.02	2.10	2.03	2.10	2.10	2.10
95th%HCM2kQ:	10.3	6.2	0.0	0.0	10.4	10.4	4.9	0.0	4.7	0.0	0.0	0.0
98th%Factor:	2.37	2.49	2.70	2.70	2.36	2.36	2.53	2.70	2.54	2.70	2.70	2.70
98th%HCM2kQ:	12.5	7.6	0.0	0.0	12.7	12.7	6.1	0.0	5.9	0.0	0.0	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline AM

Intersection #9: Arroyo Vista & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 0 0 0
Lanes: 0 0 0 0 0

Signal=Uncontrol
Rights=Include

Initial Vol:	Lanes:
0	0
	0
167	0
	1
14	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	1.3
Avg Delay (sec/veh):	1.3
LOS:	B

Signal=Uncontrol
Rights=Include

Lanes:	Initial Vol:
0	0
0	
1	205
0	
1	17

Lanes: 0 0 1! 0 0
Initial Vol: 22 0 19
Signal=Stop/Rights=Include

```
Approach:     North Bound     South Bound      East Bound      West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     22    0    19     0    0     0     0  167    14    17  205     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  22    0    19     0    0     0     0  167    14    17  205     0
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  22    0    19     0    0     0     0  167    14    17  205     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   22    0    19     0    0     0     0  167    14    17  205     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   22    0    19     0    0     0     0  167    14    17  205     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  413 xxxx   174  xxxx xxxx xxxxx  xxxx xxxx xxxxx   181 xxxx xxxxx
Potent Cap.:  599 xxxx   875  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1407 xxxx xxxxx
Move Cap.:    594 xxxx   875  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1407 xxxx xxxxx
Volume/Cap:  0.04 xxxx  0.02  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.6 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  698 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 10.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    B     *     *    *     *     *    *     *     *    *     *
ApproachDel:       10.5            xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B                *                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                      #26
Dist(miles):                                                     0.000
Speed (mph):                                                      0.00
SignalIndex:                                                     #8
Cycle Time:                                                          0 secs
InitVolume:                                                    0     0
Saturation:                                                    0     0
ArrivalType:                                                   0     0
G/C:                                                        0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                         0.000 0.000
gq1:                                                        0.00  0.00
gq2:                                                        0.00  0.00
gq:                                                         0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                           0.000
beta:                                                            0.000
ta (secs):                                                       0.000
F:                                                               0.000
f:                                                         0.000 0.000
vcmax:                                                         0     0
vcg:                                                           0     0
vcmin:                                                         0     0
tp:                                                          0.0   0.0
p:                                                               0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 413     0   174     0     0     0     0 xxxxx xxxxx  181 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol: 413     0   174     0     0     0     0 xxxxx xxxxx  181 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  599   900   875  900   900   900  900 xxxxx xxxxx 1407 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```


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```
PotentCap:   599   900   875  900   900   900  900 xxxxx xxxxx 1407 xxxxx xxxxx
                       Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:       0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:   22    0    19    0    0     0    0  167    14    17  205     0
ApproachDel:     10.5          xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=444]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:       0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:   22    0    19    0    0     0    0  167    14    17  205     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             403
Minor Approach Volume:           41
Minor Approach Volume Threshold: 598
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline AM

Intersection #10: Kaiser & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 22 0 51
Lanes: 0 0 1! 0 0

Westbound (left side): Signal=Uncontrol, Rights=Include

Initial Vol:	Lanes:
65	1
	0
130	1
	0
0	0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 2.7
Avg Delay (sec/veh): 2.7
LOS: B

Signal=Uncontrol
Rights=Include

Lanes:	Initial Vol:
0	135
1	
0	86
0	
0	0

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Stop/Rights=Include

```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0   51    0    22   65  130     0    0   86   135
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0   51    0    22   65  130     0    0   86   135
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0   51    0    22   65  130     0    0   86   135
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0   51    0    22   65  130     0    0   86   135
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Final Vol.:     0    0     0   51    0    22   65  130     0    0   86   135
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx  6.4 xxxx   6.2  4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx  3.5 xxxx   3.3  2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  414 xxxx   154  221 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  599 xxxx   898 1360 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  577 xxxx   898 1360 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx 0.09 xxxx  0.02 0.05 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx  0.2 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  7.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *    *    *     *    A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  647 xxxxx xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *    *    *     *     *    *     *
ApproachDel:     xxxxxx            11.3            xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                         #26
Dist(miles):                                                        0.000
Speed (mph):                                                         0.00
SignalIndex:                                                        #8
Cycle Time:                                                             0 secs
InitVolume:                                                      0     0
Saturation:                                                      0     0
ArrivalType:                                                     0     0
G/C:                                                          0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                           0.000 0.000
gq1:                                                          0.00  0.00
gq2:                                                          0.00  0.00
gq:                                                           0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                              0.000
beta:                                                               0.000
ta (secs):                                                          0.000
F:                                                                  0.000
f:                                                           0.000 0.000
vcmax:                                                           0     0
vcg:                                                             0     0
vcmin:                                                           0     0
tp:                                                            0.0   0.0
p:                                                                  0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                   0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0     0     0  414     0   154  221 xxxxx xxxxx    0 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol:   0     0     0  414     0   154  221 xxxxx xxxxx    0 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900   900   900  599   900   898 1360 xxxxx xxxxx  900 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```


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```
PotentCap:   900    900    900  599   900    898 1360 xxxxx xxxxx  900 xxxxx xxxxx
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0     0    51    0    22    65  130     0     0   86   135
ApproachDel:    xxxxxx              11.3             xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=73]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=489]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0     0    51    0    22    65  130     0     0   86   135
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            416
Minor Approach Volume:           73
Minor Approach Volume Threshold: 587
```

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1562
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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1562
Volume (vph)	190	708	119	779	648	558	102	382	770	337	208	56
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	708	119	779	648	558	102	382	770	337	208	56
RTOR Reduction (vph)	0	0	69	0	0	278	0	0	544	0	0	41
Lane Group Flow (vph)	190	708	50	779	648	280	102	382	226	337	208	15
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	9.8	18.8	18.8	33.2	42.2	42.2	6.1	17.6	17.6	14.0	25.5	25.5
Effective Green, g (s)	9.3	19.5	19.5	32.7	42.9	42.9	5.1	18.3	18.3	13.0	26.2	26.2
Actuated g/C Ratio	0.09	0.20	0.20	0.33	0.43	0.43	0.05	0.18	0.18	0.13	0.26	0.26
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	321	997	306	1128	1526	673	176	651	505	449	932	411
v/s Ratio Prot	0.06	c0.14		c0.23	0.18		0.03	c0.11		c0.10	0.06	
v/s Ratio Perm			0.03			0.18			0.08			0.01
v/c Ratio	0.59	0.71	0.16	0.69	0.42	0.42	0.58	0.59	0.45	0.75	0.22	0.04
Uniform Delay, d1	43.3	37.4	33.2	29.0	19.7	19.6	46.2	37.1	36.1	41.7	28.7	27.3
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	1.9	2.0	0.1	1.5	0.1	0.2	2.9	0.9	0.2	6.2	0.0	0.0
Delay (s)	45.2	39.4	33.3	30.5	19.8	19.8	49.0	38.0	36.3	47.9	28.7	27.3
Level of Service	D	D	C	C	B	B	D	D	D	D	C	C
Approach Delay (s)		39.8			24.0			37.9			39.3	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱				↰↰		↱
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	1615	200	0	1569	405	0	0	0	541	0	523
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1615	200	0	1569	405	0	0	0	541	0	523
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	16
Lane Group Flow (vph)	0	1615	200	0	1569	405	0	0	0	541	0	507
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		57.2	100.0		57.0	100.0				32.6		32.6
Effective Green, g (s)		58.2	100.0		58.2	100.0				33.8		33.8
Actuated g/C Ratio		0.58	1.00		0.58	1.00				0.34		0.34
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2959	1583		2959	2787				1160		535
v/s Ratio Prot		c0.32			0.31							
v/s Ratio Perm			0.13			0.15				0.16		c0.32
v/c Ratio		0.55	0.13		0.53	0.15				0.47		0.95
Uniform Delay, d1		12.8	0.0		12.6	0.0				26.0		32.2
Progression Factor		1.00	1.00		0.74	1.00				1.00		1.00
Incremental Delay, d2		0.7	0.2		0.6	0.1				0.1		25.9
Delay (s)		13.5	0.2		10.0	0.1				26.1		58.2
Level of Service		B	A		B	A				C		E
Approach Delay (s)		12.1			8.0			0.0			41.9	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	1573	583	0	1586	1216	394	0	370	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1573	583	0	1586	1216	394	0	370	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	65	0	0	0
Lane Group Flow (vph)	0	1573	583	0	1586	1216	394	0	305	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		75.0	100.0		75.3	100.0	14.4		14.4			
Effective Green, g (s)		76.3	100.0		76.3	100.0	15.7		15.7			
Actuated g/C Ratio		0.76	1.00		0.76	1.00	0.16		0.16			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3880	1550		3880	2787	539		438			
v/s Ratio Prot		0.31			0.31							
v/s Ratio Perm			0.38			c0.44	c0.11		0.11			
v/c Ratio		0.41	0.38		0.41	0.44	0.73		0.70			
Uniform Delay, d1		4.1	0.0		4.1	0.0	40.1		39.9			
Progression Factor		0.81	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.3	0.6		0.3	0.5	4.4		3.9			
Delay (s)		3.6	0.6		4.4	0.5	44.5		43.8			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		2.8			2.7			44.2			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
Baseline AM

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 406*** 195 156
Lanes: 1 0 2 0 2

Westbound approach (left side of diagram): Signal=Protect, Rights=Overlap
Initial Vol: / Lanes:
475*** 2
0
918 3
0
603 1

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 16
Critical V/C: 0.965
Avg Crit Del (sec/veh): 112.9
Avg Delay (sec/veh): 74.6
LOS: E

Right side of diagram: Signal=Protect, Rights=Overlap
Lanes: / Initial Vol:
1 329
0
3 1669***
0
2 168

Lanes: 2 0 2 0 1
Initial Vol: 664*** 764 149
Signal=Protect/Rights=Overlap

Approach:	North Bound L	North Bound T	North Bound R	South Bound L	South Bound T	South Bound R	East Bound L	East Bound T	East Bound R	West Bound L	West Bound T	West Bound R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	664	764	149	156	195	406	475	918	603	168	1669	329
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	664	764	149	156	195	406	475	918	603	168	1669	329
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	664	764	149	156	195	406	475	918	603	168	1669	329
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	664	764	149	156	195	406	475	918	603	168	1669	329
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	664	764	149	156	195	406	475	918	603	168	1669	329
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	730	764	149	172	195	406	522	918	603	185	1669	329
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.27	0.28	0.11	0.06	0.07	0.30	0.19	0.22	0.44	0.07	0.40	0.24
Crit Vol:	365					406	0				556	
Crit Moves:	****					****	****				****	

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline PM

Intersection #1: Valley Hi & Mack

Signal=Protect/Rights=Include
Initial Vol: 124 218 465***
Lanes: 0 1 1 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Initial Vol:
113***	1		Vol Cnt Date:	n/a		0	285
			Cycle Time (sec):	100			
	0		Loss Time (sec):	16		1	
1100	2		Critical V/C:	0.753		1	885***
	0		Avg Crit Del (sec/veh):	36.1		0	
187	1		Avg Delay (sec/veh):	35.0		2	430
			LOS:	C			

Lanes: 2 0 1 1 1
Initial Vol: 313 162*** 420
Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	10	0	4	6	0	4	26	0	4	38	0
Volume Module:												
Base Vol:	313	162	420	465	218	124	113	1100	187	430	885	285
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	313	162	420	465	218	124	113	1100	187	430	885	285
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	313	162	420	465	218	124	113	1100	187	430	885	285
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	313	162	420	465	218	124	113	1100	187	430	885	285
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	313	162	420	465	218	124	113	1100	187	430	885	285
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	313	162	420	465	218	124	113	1100	187	430	885	285
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.85	0.85	0.92	0.90	0.90	0.95	0.95	0.85	0.92	0.91	0.91
Lanes:	2.00	1.00	2.00	2.00	1.27	0.73	1.00	2.00	1.00	2.00	1.51	0.49
Final Sat.:	3502	1610	3220	3502	2177	1238	1805	3610	1615	3502	2630	847
Capacity Analysis Module:												
Vol/Sat:	0.09	0.10	0.13	0.13	0.10	0.10	0.06	0.30	0.12	0.12	0.34	0.34
Crit Moves:		****		****			****				****	
Green/Cycle:	0.15	0.13	0.29	0.18	0.16	0.16	0.08	0.38	0.38	0.15	0.45	0.45
Volume/Cap:	0.61	0.75	0.46	0.75	0.61	0.61	0.75	0.81	0.31	0.81	0.75	0.75
Delay/Veh:	42.2	45.9	29.6	44.3	40.8	40.8	64.0	31.5	22.2	49.8	25.2	25.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.2	45.9	29.6	44.3	40.8	40.8	64.0	31.5	22.2	49.8	25.2	25.2
HCM2kAvg:	6	7	6	9	6	6	5	17	4	9	16	16

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline PM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Overlap
Initial Vol: 530*** 0 0
Lanes: 2 0 0 0 0

Signal=Protect
Rights=Ignore
Initial Vol: Lanes:
0 0
0
1825*** 2
0
170 1

Vol Cnt Date: n/a
Cycle Time (sec): 60
Loss Time (sec): 8
Critical V/C: 1.087
Avg Crit Del (sec/veh): 33.0
Avg Delay (sec/veh): 24.4
LOS: C

Signal=Protect
Rights=Include
Lanes: Initial Vol:
0 0
0
2 1182
0
1 451***

Lanes: 0 0 0 0 1
Initial Vol: 0 0 1622
Signal=Protect/Rights=Ignore

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	1622	0	0	530	0	1825	170	451	1182	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	1622	0	0	530	0	1825	170	451	1182	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	1622	0	0	530	0	1825	170	451	1182	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	530	0	1825	0	451	1182	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	530	0	1825	0	451	1182	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	530	0	1825	0	451	1182	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.51	0.00	0.25	0.33	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.67	0.00	1.04	0.47	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	94.8	0.0	4.1	0.0	77.1	4.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	94.8	0.0	4.1	0.0	77.1	4.2	0.0
HCM2kAvg:	0	0	0	0	0	12	0	9	0	17	5	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		0 0 0 0 1			0 0 0 0 2			0 0 2 0 1			1 0 2 0 0	
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	4.4	0.0	7.4	0.0	7.9	4.4	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	7.4	0.0	1.9	0.0	9.0	0.9	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	11.8	0.0	9.3	0.0	16.9	5.3	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.17	1.20	1.18	1.20	1.17	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	13.9	0.0	11.0	0.0	19.7	6.3	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.50	1.60	1.52	1.60	1.47	1.55	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	17.8	0.0	14.1	0.0	24.8	8.2	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.62	1.80	1.65	1.80	1.57	1.71	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	19.2	0.0	15.4	0.0	26.5	9.0	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.81	2.10	1.86	2.10	1.73	1.95	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	21.4	0.0	17.3	0.0	29.3	10.3	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.10	2.70	2.19	2.70	1.97	2.37	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	24.9	0.0	20.4	0.0	33.3	12.5	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline PM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 73 526 159***
Lanes: 1 0 2 0 1

Initial Vol:	Lanes:	Signal=Split Rights=Include			Signal=Split Rights=Include	Lanes:	Initial Vol:
54	1		Vol Cnt Date:	n/a		2	379***
			Cycle Time (sec):	90			
	0		Loss Time (sec):	16		0	
34***	1!		Critical V/C:	0.477		0	81
	0		Avg Crit Del (sec/veh):	29.7		1	
12	0		Avg Delay (sec/veh):	26.8		1	234
			LOS:	C			

Lanes: 1 0 2 0 1
Initial Vol: 19 472*** 84
Signal=Protect/Rights=Include

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4    4     0     6    6     0     0    4     0     0    4     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     19  472    84   159  526    73    54   34    12   234   81   379
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  19  472    84   159  526    73    54   34    12   234   81   379
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  19  472    84   159  526    73    54   34    12   234   81   379
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   19  472    84   159  526    73    54   34    12   234   81   379
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  19  472    84   159  526    73    54   34    12   234   81   379
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   19  472    84   159  526    73    54   34    12   234   81   379
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.96 0.96  0.75
Lanes:       1.00 2.00  1.00  1.00 2.00  1.00  1.37 0.47  0.16  1.49 0.51  2.00
Final Sat.:  1805 3610  1615  1805 3610  1615  2489  846   299  2721  942  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.13  0.05  0.09 0.15  0.05  0.02 0.04  0.04  0.09 0.09  0.13
Crit Moves:       ****        ****                  ****                    ****
Green/Cycle: 0.11 0.27  0.27  0.18 0.35  0.35  0.08 0.08  0.08  0.28 0.28  0.28
Volume/Cap:  0.10 0.48  0.19  0.48 0.41  0.13  0.26 0.48  0.48  0.31 0.31  0.48
Delay/Veh:   36.5 27.7  25.2  33.9 22.4  19.9  38.9 41.0  41.0  25.7 25.7  27.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  36.5 27.7  25.2  33.9 22.4  19.9  38.9 41.0  41.0  25.7 25.7  27.4
HCM2kAvg:      1    6     2     5    6     1     1    3     3     4    4     5
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        1  0  2  0  1   1  0  2  0  1    1  0  1! 0  0    1  1  0  0  2
Lane Group:    L    T     R     L    T     R   LTR  LTR   LTR    LT   LT     R
#LnsInGrps:    1    2     1     1    2     1     2    1     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid        8                8                8                8
% Hev Veh:          0                0                0                0
Grade:             0%               0%               0%               0%
Parking/Hr:        No               No               No               No
Bus Stp/Hr:         0                0                0                0
Area Type:   < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > > >
Cnft Ped/Hr:        0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:         0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx     1 xxxx  xxxx     4    4     4     4    4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx xxxx  0.85  xxxx xxxx  0.85  0.98 0.98  0.98  xxxx xxxx  0.85
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.97 0.97  0.97  0.96 0.96 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95 1.00  0.85  0.96 0.96  0.96  0.96 0.96  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  1.00  1.00 1.00  1.00  1.00 1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.96 0.96  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                      2000 HCM Operations Method
                       Future Volume Alternative
```

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Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.11	0.27	0.27	0.18	0.35	0.35	0.08	0.08	0.08	0.28	0.28	0.28
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.5	4.9	1.6	3.7	5.0	1.2	0.9	1.8	1.8	3.2	3.2	3.9
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	0.9	0.2	0.9	0.7	0.1	0.3	0.8	0.8	0.4	0.4	0.9
HCM2KQueue:	0.6	5.8	1.8	4.6	5.7	1.4	1.3	2.6	2.6	3.7	3.7	4.8
70th%Factor:	1.20	1.19	1.20	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	0.7	6.9	2.2	5.5	6.8	1.7	1.5	3.1	3.1	4.4	4.4	5.7
85th%Factor:	1.59	1.55	1.58	1.56	1.55	1.59	1.59	1.57	1.57	1.57	1.57	1.56
85th%HCM2kQ:	0.9	9.0	2.9	7.2	8.8	2.2	2.0	4.1	4.1	5.7	5.7	7.5
90th%Factor:	1.79	1.70	1.76	1.72	1.70	1.77	1.78	1.75	1.75	1.73	1.73	1.71
90th%HCM2kQ:	1.0	9.9	3.2	7.9	9.7	2.5	2.3	4.6	4.6	6.3	6.3	8.3
95th%Factor:	2.08	1.93	2.04	1.96	1.94	2.06	2.06	2.02	2.02	1.99	1.99	1.96
95th%HCM2kQ:	1.2	11.2	3.8	9.1	11.0	2.9	2.6	5.3	5.3	7.3	7.3	9.4
98th%Factor:	2.66	2.34	2.57	2.40	2.35	2.60	2.61	2.52	2.52	2.45	2.45	2.39
98th%HCM2kQ:	1.5	13.6	4.7	11.1	13.3	3.6	3.4	6.6	6.6	9.0	9.0	11.5

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline PM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 613 120
Lanes: 0 0 2 0 1

Signal=Stop
Rights=Include

Initial Vol:	Lanes:
0	0
	0
0	0
	0
0	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	3.4
Avg Delay (sec/veh):	3.4
LOS:	C

Signal=Stop
Rights=Include

Lanes:	Initial Vol:
1	146
0	
0	0
0	
1	75

Lanes: 0 0 1 1 0
Initial Vol: 0 429 42
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  429    42   120  613     0     0    0     0    75    0   146
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  429    42   120  613     0     0    0     0    75    0   146
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0  429    42   120  613     0     0    0     0    75    0   146
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  429    42   120  613     0     0    0     0    75    0   146
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    0  429    42   120  613     0     0    0     0    75    0   146
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   471 xxxx xxxxx  xxxx xxxx xxxxx   997 xxxx   236
Potent Cap.: xxxx xxxx xxxxx  1101 xxxx xxxxx  xxxx xxxx xxxxx   245 xxxx   772
Move Cap.:   xxxx xxxx xxxxx  1101 xxxx xxxxx  xxxx xxxx xxxxx   224 xxxx   772
Volume/Cap:  xxxx xxxx  xxxx  0.11 xxxx  xxxx  xxxx xxxx  xxxx  0.33 xxxx  0.19
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.4 xxxx xxxxx xxxxx xxxx xxxxx   1.4 xxxx   0.7
Stopped Del:xxxxx xxxx xxxxx   8.7 xxxx xxxxx xxxxx xxxx xxxxx  28.9 xxxx  10.7
LOS by Move:   *    *     *     A    *     *     *    *     *     D    *     B
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            16.9
ApproachLOS:        *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                          #5
Dist(miles):                         0.000
Speed (mph):                          0.00
SignalIndex:                         #3
Cycle Time:                              0 secs
InitVolume:                        0     0
Saturation:                        0     0
ArrivalType:                       0     0
G/C:                            0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                             0.000 0.000
gq1:                            0.00  0.00
gq2:                            0.00  0.00
gq:                             0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                               0.000
beta:                                0.000
ta (secs):                           0.000
F:                                   0.000
f:                             0.000 0.000
vcmax:                             0     0
vcg:                               0     0
vcmin:                             0     0
tp:                              0.0   0.0
p:                                   0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0 xxxxx xxxxx  471 xxxxx xxxxx    0     0     0  997     0   236
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:   0 xxxxx xxxxx  471 xxxxx xxxxx    0     0     0  997     0   236
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx 1101 xxxxx xxxxx  900   900   900  245   900   772
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:   900 xxxxx xxxxx 1101 xxxxx xxxxx  900   900   900  245   900   772
                       Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  429    42   120  613     0     0    0     0    75    0   146
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            16.9
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.0]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=221]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1425]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  429    42   120  613     0     0    0     0    75    0   146
------------|---------------||---------------||---------------||---------------|
Major Street Volume:              1204
Minor Approach Volume:            221
Minor Approach Volume Threshold:  294
```


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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline PM

Intersection #5: Alta Valley & Bruceville

Signal=Split/Rights=Include
Initial Vol: 120 64 328***
Lanes: 0 1 0 1 1

Signal=Split
Rights=Include

Initial Vol:	Lanes:
63	1
	0
208***	1
	1
33	0

Vol Cnt Date:	n/a
Cycle Time (sec):	80
Loss Time (sec):	16
Critical V/C:	0.645
Avg Crit Del (sec/veh):	29.7
Avg Delay (sec/veh):	29.6
LOS:	C

Signal=Split
Rights=Include

Lanes:	Initial Vol:
0	362
1	
1	394***
0	
1	37

Lanes: 0 1 0 1 0
Initial Vol: 82 203*** 127
Signal=Split/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	82	203	127	328	64	120	63	208	33	37	394	362
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	82	203	127	328	64	120	63	208	33	37	394	362
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	82	203	127	328	64	120	63	208	33	37	394	362
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	82	203	127	328	64	120	63	208	33	37	394	362
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	203	127	328	64	120	63	208	33	37	394	362
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	82	203	127	328	64	120	63	208	33	37	394	362
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.90	0.89	0.89	0.89	0.95	0.93	0.93	0.95	0.88	0.88
Lanes:	0.40	0.98	0.62	1.92	0.38	0.70	1.00	1.73	0.27	1.00	1.04	0.96
Final Sat.:	679	1680	1051	3244	633	1187	1805	3050	484	1805	1746	1604
Capacity Analysis Module:												
Vol/Sat:	0.12	0.12	0.12	0.10	0.10	0.10	0.03	0.07	0.07	0.02	0.23	0.23
Crit Moves:		****		****				****			****	
Green/Cycle:	0.19	0.19	0.19	0.16	0.16	0.16	0.11	0.11	0.11	0.35	0.35	0.35
Volume/Cap:	0.64	0.64	0.64	0.64	0.64	0.64	0.33	0.64	0.64	0.06	0.64	0.64
Delay/Veh:	32.3	32.3	32.3	33.5	33.5	33.5	34.2	38.2	38.2	17.3	23.1	23.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.3	32.3	32.3	33.5	33.5	33.5	34.2	38.2	38.2	17.3	23.1	23.1
HCM2kAvg:	6	6	6	5	5	5	2	4	4	1	9	9
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 1	0 1	0	1 1	0 1	0	1 0	1 1	0	1 0	1 1	0
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.95	0.95	0.95	0.97	0.97	0.97	xxxx	0.98	0.98	xxxx	0.93	0.93
LT Adj:	0.99	0.99	0.99	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.95	0.98	0.98	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.90	0.90	0.90	0.89	0.89	0.89	0.95	0.93	0.93	0.95	0.88	0.88
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.19	0.19	0.19	0.16	0.16	0.16	0.11	0.11	0.11	0.35	0.35	0.35
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.3	4.3	4.3	3.7	3.7	3.7	1.4	2.6	2.6	0.6	7.1	7.1
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	1.6	1.6	1.6	1.6	1.6	1.6	0.5	1.5	1.5	0.1	1.7	1.7
HCM2KQueue:	5.9	5.9	5.9	5.3	5.3	5.3	1.8	4.1	4.1	0.6	8.8	8.8
70th%Factor:	1.19	1.19	1.19	1.19	1.19	1.19	1.20	1.19	1.19	1.20	1.18	1.18
70th%HCM2kQ:	7.0	7.0	7.0	6.3	6.3	6.3	2.2	4.9	4.9	0.8	10.3	10.3
85th%Factor:	1.55	1.55	1.55	1.55	1.55	1.55	1.58	1.56	1.56	1.59	1.52	1.52
85th%HCM2kQ:	9.1	9.1	9.1	8.2	8.2	8.2	2.9	6.4	6.4	1.0	13.3	13.3
90th%Factor:	1.70	1.70	1.70	1.71	1.71	1.71	1.76	1.73	1.73	1.79	1.66	1.66
90th%HCM2kQ:	10.0	10.0	10.0	9.0	9.0	9.0	3.3	7.1	7.1	1.1	14.5	14.5
95th%Factor:	1.93	1.93	1.93	1.95	1.95	1.95	2.04	1.98	1.98	2.08	1.87	1.87
95th%HCM2kQ:	11.4	11.4	11.4	10.3	10.3	10.3	3.8	8.1	8.1	1.3	16.4	16.4
98th%Factor:	2.34	2.34	2.34	2.37	2.37	2.37	2.57	2.43	2.43	2.65	2.21	2.21
98th%HCM2kQ:	13.8	13.8	13.8	12.5	12.5	12.5	4.7	10.0	10.0	1.7	19.3	19.3

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline PM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Split/Rights=Overlap
Initial Vol: 136 0 146***
Lanes: 1 0 0 0 1

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
213***	1		Vol Cnt Date:	n/a		0	43
			Cycle Time (sec):	90			
	0		Loss Time (sec):	14		1	
369	2		Critical V/C:	0.486		1	714***
	0		Avg Crit Del (sec/veh):	22.9		0	
0	0		Avg Delay (sec/veh):	18.1		0	0
			LOS:	B			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Split/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	4	0	0	4	6	0	0	6	0
Volume Module:												
Base Vol:	0	0	0	146	0	136	213	369	0	0	714	43
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	146	0	136	213	369	0	0	714	43
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	146	0	136	213	369	0	0	714	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	146	0	136	213	369	0	0	714	43
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	146	0	136	213	369	0	0	714	43
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	146	0	136	213	369	0	0	714	43
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.94	0.94
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.89	0.11
Final Sat.:	0	0	0	1805	0	1615	1805	3610	0	0	3374	203
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.08	0.12	0.10	0.00	0.00	0.21	0.21
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.17	0.00	0.41	0.24	0.68	0.00	0.00	0.44	0.60
Volume/Cap:	0.00	0.00	0.00	0.49	0.00	0.21	0.49	0.15	0.00	0.00	0.49	0.35
Delay/Veh:	0.0	0.0	0.0	35.3	0.0	17.3	30.1	5.2	0.0	0.0	18.4	9.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	35.3	0.0	17.3	30.1	5.2	0.0	0.0	18.4	9.2
HCM2kAvg:	0	0	0	4	0	2	6	2	0	0	8	5
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Lane Group:	xxxx	xxxx	xxxx	L	xxxx	R	L	T	xxxx	xxxx	RT	RT
#LnsInGrps:	0	0	0	1	0	1	1	2	0	0	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Hev Veh Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Grade Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Area Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	0.99	0.99
LT Adj:	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	1.00	1.00	1.00	0.99	0.99
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Fnl Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.94	0.94
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.17	0.00	0.41	0.24	0.68	0.00	0.00	0.44	0.60
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	3.5	0.0	2.2	4.8	1.7	0.0	0.0	6.8	4.8
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	0.9	0.0	0.3	0.9	0.2	0.0	0.0	0.9	0.5
HCM2KQueue:	0.0	0.0	0.0	4.4	0.0	2.5	5.7	1.8	0.0	0.0	7.7	5.3
70th%Factor:	1.20	1.20	1.20	1.19	1.20	1.19	1.19	1.20	1.20	1.20	1.18	1.19
70th%HCM2kQ:	0.0	0.0	0.0	5.2	0.0	2.9	6.8	2.2	0.0	0.0	9.1	6.3
85th%Factor:	1.60	1.60	1.60	1.56	1.60	1.58	1.55	1.58	1.60	1.60	1.53	1.55
85th%HCM2kQ:	0.0	0.0	0.0	6.8	0.0	3.9	8.9	2.9	0.0	0.0	11.8	8.3
90th%Factor:	1.80	1.80	1.80	1.72	1.80	1.75	1.70	1.77	1.80	1.80	1.67	1.71
90th%HCM2kQ:	0.0	0.0	0.0	7.6	0.0	4.3	9.7	3.2	0.0	0.0	12.9	9.1
95th%Factor:	2.10	2.10	2.10	1.97	2.10	2.02	1.94	2.04	2.10	2.10	1.89	1.95
95th%HCM2kQ:	0.0	0.0	0.0	8.6	0.0	5.0	11.1	3.7	0.0	0.0	14.6	10.4
98th%Factor:	2.70	2.70	2.70	2.41	2.70	2.53	2.34	2.57	2.70	2.70	2.25	2.36
98th%HCM2kQ:	0.0	0.0	0.0	10.6	0.0	6.2	13.4	4.7	0.0	0.0	17.4	12.6

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline PM

Intersection #7: Bruceville / Kaiser Access

```
                         Signal=Uncontrol/Rights=Include
          Initial Vol:       95          507          0
                Lanes:        0     1      1      0   0

                  Signal=Stop                                          Signal=Stop
Initial Vol:  Lanes:  Rights=Include        Vol Cnt Date:    n/a      Rights=Include   Lanes:  Initial Vol:
                                         Cycle Time (sec):   100
    115          0
                                          Loss Time (sec):     0                          0          0
                 0                                                                        0
      0          1!                          Critical V/C:   0.000                        0          0
                 0                     Avg Crit Del (sec/veh):  18.3                      0
    180          0                       Avg Delay (sec/veh):   18.3                      0          0
                                                       LOS:     F

                Lanes:        1     0      1      0   0
          Initial Vol:      100          627          0
                         Signal=Uncontrol/Rights=Include
```

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     100   627    0     0   507   95   115    0   180     0    0    0
Growth Adj:  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00  1.00 1.00 1.00
Initial Bse:  100   627    0     0   507   95   115    0   180     0    0    0
Added Vol:      0     0    0     0     0    0     0    0     0     0    0    0
PasserByVol:    0     0    0     0     0    0     0    0     0     0    0    0
Initial Fut:  100   627    0     0   507   95   115    0   180     0    0    0
User Adj:    1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00  1.00 1.00 1.00
PHF Adj:     1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00  1.00 1.00 1.00
PHF Volume:   100   627    0     0   507   95   115    0   180     0    0    0
Reduct Vol:     0     0    0     0     0    0     0    0     0     0    0    0
Final Vol.:   100   627    0     0   507   95   115    0   180     0    0    0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  602 xxxx xxxxx  xxxx xxxx xxxxx  1382 xxxx   301  xxxx xxxx xxxxx
Potent Cap.:  985 xxxx xxxxx  xxxx xxxx xxxxx   160 xxxx   743  xxxx xxxx xxxxx
Move Cap.:    985 xxxx xxxxx  xxxx xxxx xxxxx   148 xxxx   743  xxxx xxxx xxxxx
Volume/Cap:  0.10 xxxx  xxxx  xxxx xxxx  xxxx  0.78 xxxx  0.24  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  289 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.9 xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 97.6 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    F     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx            97.6           xxxxxx
ApproachLOS:         *                *                F               *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:         #120
Dist(miles):        0.000
Speed (mph):         0.00
SignalIndex:        #8
Cycle Time:             0 secs
InitVolume:       0     0
Saturation:       0     0
ArrivalType:      0     0
G/C:           0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:            0.000 0.000
gq1:           0.00  0.00
gq2:           0.00  0.00
gq:            0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:              0.000
beta:               0.000
ta (secs):          0.000
F:                  0.000
f:            0.000 0.000
vcmax:            0     0
vcg:              0     0
vcmin:            0     0
tp:             0.0   0.0
p:                  0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 602 xxxxx xxxxx    0 xxxxx xxxxx 1382    0   301    0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 602 xxxxx xxxxx    0 xxxxx xxxxx 1382    0   301    0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  985 xxxxx xxxxx  900 xxxxx xxxxx  160  900   743  900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```


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```
PotentCap:    985 xxxxx xxxxx  900 xxxxx xxxxx  160   900   743  900   900   900
                         Peak Hour Delay Signal Warrant Report
**********************************************************************************
Intersection #7 Bruceville / Kaiser Access
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled        Stop Sign         Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:  100  627     0     0  507    95   115    0   180     0     0     0
ApproachDel:    xxxxxx            xxxxxx              97.6             xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=8.0]
   SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=295]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1624]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
**********************************************************************************
Intersection #7 Bruceville / Kaiser Access
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled        Stop Sign         Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:  100  627     0     0  507    95   115    0   180     0     0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1329
Minor Approach Volume:           295
Minor Approach Volume Threshold: 187
```


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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline PM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 136 558*** 0
Lanes: 0 1 1 0 0

West side (Signal=Protect, Rights=Overlap):

Initial Vol:	Lanes:
116***	1
	0
0	0
	0
187	1

Vol Cnt Date:	n/a
Cycle Time (sec):	104
Loss Time (sec):	12
Critical V/C:	0.390
Avg Crit Del (sec/veh):	21.8
Avg Delay (sec/veh):	16.1
LOS:	B

East side (Signal=Protect, Rights=Include):

Lanes:	Initial Vol:
0	0
0	
0	0
0	
0	0

Lanes: 1 0 2 0 0
Initial Vol: 149*** 617 0
Signal=Protect/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     5    6    0     0    6    0     4    0    5     0    0    0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     149  617    0     0  558  136   116    0  187     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  149  617    0     0  558  136   116    0  187     0    0    0
Added Vol:      0    0    0     0    0    0     0    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:  149  617    0     0  558  136   116    0  187     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   149  617    0     0  558  136   116    0  187     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  149  617    0     0  558  136   116    0  187     0    0    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   149  617    0     0  558  136   116    0  187     0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.95 0.95 1.00  1.00 0.92 0.92  0.95 1.00 0.85  1.00 1.00 1.00
Lanes:       1.00 2.00 0.00  0.00 1.61 0.39  1.00 0.00 1.00  0.00 0.00 0.00
Final Sat.:  1805 3610    0     0 2818  687  1805    0 1615     0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.17 0.00  0.00 0.20 0.20  0.06 0.00 0.12  0.00 0.00 0.00
Crit Moves:  ****                 ****       ****
Green/Cycle: 0.21 0.72 0.00  0.00 0.51 0.51  0.16 0.00 0.38  0.00 0.00 0.00
Volume/Cap:  0.39 0.24 0.00  0.00 0.39 0.39  0.39 0.00 0.31  0.00 0.00 0.00
Delay/Veh:   35.9  5.0  0.0   0.0 15.8 15.8  39.6  0.0 23.1   0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  35.9  5.0  0.0   0.0 15.8 15.8  39.6  0.0 23.1   0.0  0.0  0.0
HCM2kAvg:       5    3    0     0    7    7     4    0    4     0    0    0
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         1  0  2  0  0    0  0  1  1  0    1  0  0  0  1    0  0  0  0  0
Lane Group:     L    T xxxx  xxxx  RT    RT     L xxxx    R  xxxx xxxx xxxx
#LnsInGrps:     1    2    0     0    2    2     1    0    1     0    0    0
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12   12    12   12   12    12   12   12    12   12   12
CrosswalkWid         8               8               8               8
% Hev Veh:           0               0               0               0
Grade:              0%              0%              0%              0%
Parking/Hr:         No              No              No              No
Bus Stp/Hr:          0               0               0               0
Area Type:    < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0               0               0               0
ExclusiveRT:     Include         Include         Include         Include
% RT Prtct:          0               0               0               0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx xxxx  xxxx xxxx xxxx     1 xxxx xxxx  xxxx xxxx xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00 xxxxx xxxx 1.00 1.00  1.00 xxxx 1.00  xxxx xxxx xxxxx
Hev Veh Adj: 1.00 1.00 xxxxx xxxx 1.00 1.00  1.00 xxxx 1.00  xxxx xxxx xxxxx
Grade Adj:   1.00 1.00 xxxxx xxxx 1.00 1.00  1.00 xxxx 1.00  xxxx xxxx xxxxx
Parking Adj: xxxx 1.00 xxxxx xxxx 1.00 1.00  xxxx xxxx 1.00  xxxx xxxx xxxxx
Bus Stp Adj: xxxx 1.00 xxxxx xxxx 1.00 1.00  xxxx xxxx 1.00  xxxx xxxx xxxxx
Area Adj:    1.00 1.00 xxxxx xxxx 1.00 1.00  1.00 xxxx 1.00  xxxx xxxx xxxxx
RT Adj:      xxxx xxxx xxxxx xxxx 0.97 0.97  xxxx xxxx 0.85  xxxx xxxx xxxxx
LT Adj:      0.95 xxxx xxxxx xxxx xxxx xxxxx 0.95 xxxx xxxxx xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
HCM Sat Adj: 0.95 1.00 1.00  1.00 0.97 0.97  0.95 1.00 0.85  1.00 1.00 1.00
Usr Sat Adj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Sat Adj: 1.00 0.95 1.00  1.00 0.95 0.95  1.00 1.00 1.00  1.00 1.00 1.00
Fnl Sat Adj: 0.95 0.95 1.00  1.00 0.92 0.92  0.95 1.00 0.85  1.00 1.00 1.00
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00 0.00  0.00 1.00 1.00  1.00 0.00 1.00  0.00 0.00 0.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                        Future Volume Alternative
```


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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.21	0.72	0.00	0.00	0.51	0.51	0.16	0.00	0.38	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	3.9	3.0	0.0	0.0	6.2	6.2	3.1	0.0	3.8	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.6	0.3	0.0	0.0	0.6	0.6	0.6	0.0	0.4	0.0	0.0	0.0
HCM2KQueue:	4.5	3.3	0.0	0.0	6.8	6.8	3.8	0.0	4.2	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.18	1.18	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	5.4	4.0	0.0	0.0	8.0	8.0	4.5	0.0	5.1	0.0	0.0	0.0
85th%Factor:	1.56	1.57	1.60	1.60	1.54	1.54	1.56	1.60	1.56	1.60	1.60	1.60
85th%HCM2kQ:	7.0	5.2	0.0	0.0	10.4	10.4	5.9	0.0	6.6	0.0	0.0	0.0
90th%Factor:	1.72	1.74	1.80	1.80	1.68	1.68	1.73	1.80	1.72	1.80	1.80	1.80
90th%HCM2kQ:	7.8	5.8	0.0	0.0	11.4	11.4	6.5	0.0	7.3	0.0	0.0	0.0
95th%Factor:	1.97	2.00	2.10	2.10	1.91	1.91	1.99	2.10	1.97	2.10	2.10	2.10
95th%HCM2kQ:	8.9	6.6	0.0	0.0	13.0	13.0	7.5	0.0	8.4	0.0	0.0	0.0
98th%Factor:	2.41	2.47	2.70	2.70	2.29	2.29	2.45	2.70	2.42	2.70	2.70	2.70
98th%HCM2kQ:	10.9	8.2	0.0	0.0	15.6	15.6	9.2	0.0	10.3	0.0	0.0	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline PM

Intersection #9: Arroyo Vista & Wyndham

```
                         Signal=Stop/Rights=Include
          Initial Vol:      0          0          0
                Lanes:      0    0     0     0    0

                 Signal=Uncontrol                                  Signal=Uncontrol
Initial Vol:  Lanes:  Rights=Include      Vol Cnt Date:      n/a    Rights=Include   Lanes:  Initial Vol:
                                     Cycle Time (sec):       100
     0          0                                                                       0        0
                                       Loss Time (sec):        0
                0                                                                       0
   214          0                         Critical V/C:    0.000                        1      212
                1                   Avg Crit Del (sec/veh):  1.3                        0
    35          0                     Avg Delay (sec/veh):   1.3                        1       27
                                                   LOS:        B

                Lanes:      0    0     1!    0    0
          Initial Vol:     24          0         19
                         Signal=Stop/Rights=Include
```

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     24    0    19     0    0     0     0  214    35    27  212     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  24    0    19     0    0     0     0  214    35    27  212     0
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  24    0    19     0    0     0     0  214    35    27  212     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   24    0    19     0    0     0     0  214    35    27  212     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   24    0    19     0    0     0     0  214    35    27  212     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  497 xxxx   232  xxxx xxxx xxxxx  xxxx xxxx xxxxx   249 xxxx xxxxx
Potent Cap.:  536 xxxx   813  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1328 xxxx xxxxx
Move Cap.:    527 xxxx   813  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1328 xxxx xxxxx
Volume/Cap:  0.05 xxxx  0.02  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.8 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  624 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 11.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    B     *     *    *     *     *    *     *     *    *     *
ApproachDel:      11.2            xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        B                *                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                       #26
Dist(miles):                                                    0.000
Speed (mph):                                                     0.00
SignalIndex:                                                       #8
Cycle Time:                                                         0 secs
InitVolume:                                                     0    0
Saturation:                                                     0    0
ArrivalType:                                                    0    0
G/C:                                                         0.00 0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                          0.000 0.000
gq1:                                                         0.00  0.00
gq2:                                                         0.00  0.00
gq:                                                          0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                          0.000
beta:                                                           0.000
ta (secs):                                                      0.000
F:                                                              0.000
f:                                                          0.000 0.000
vcmax:                                                          0     0
vcg:                                                            0     0
vcmin:                                                          0     0
tp:                                                           0.0   0.0
p:                                                              0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 498     0   232     0     0     0     0 xxxxx xxxxx  249 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol: 498     0   232     0     0     0     0 xxxxx xxxxx  249 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  536   900   813   900   900   900   900 xxxxx xxxxx 1328 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

```
PotentCap:   536    900    813  900    900    900  900 xxxxx xxxxx 1328 xxxxx xxxxx
                        Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #9 Arroyo Vista & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:    24    0    19     0    0     0     0  214    35    27  212     0
ApproachDel:       11.2            xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=43]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=531]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #9 Arroyo Vista & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:    24    0    19     0    0     0     0  214    35    27  212     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             488
Minor Approach Volume:           43
Minor Approach Volume Threshold: 532
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline PM

Intersection #10: Kaiser & Wyndham

Signal=Stop/Rights=Include

Initial Vol: 73 0 85
Lanes: 0 0 1! 0 0

Initial Vol:	Lanes:	Signal=Uncontrol Rights=Include			Signal=Uncontrol Rights=Include	Lanes:	Initial Vol:
17	1		Vol Cnt Date:	n/a		0	46
	0		Cycle Time (sec):	100		1	
153	1		Loss Time (sec):	0		0	191
	0		Critical V/C:	0.000		0	
0	0		Avg Crit Del (sec/veh):	3.5		0	0
			Avg Delay (sec/veh):	3.5			
			LOS:	B			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Stop/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0     0    85    0    73    17  153     0     0  191    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0    85    0    73    17  153     0     0  191    46
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0    0     0    85    0    73    17  153     0     0  191    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0    85    0    73    17  153     0     0  191    46
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    0    0     0    85    0    73    17  153     0     0  191    46
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   401 xxxx   214   237 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   609 xxxx   831  1342 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   603 xxxx   831  1342 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.14 xxxx  0.09  0.01 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  691 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            11.8            xxxxxx           xxxxxx
ApproachLOS:       *                 B                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:           0%               0%               0%               0%
Grade:            0%               0%               0%               0%
Peds/Hour:        0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:      12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                        #26
Dist(miles):                                                     0.000
Speed (mph):                                                      0.00
SignalIndex:                                                       #8
Cycle Time:                                                          0 secs
InitVolume:                                                      0      0
Saturation:                                                      0      0
ArrivalType:                                                     0      0
G/C:                                                          0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                           0.000 0.000
gq1:                                                          0.00  0.00
gq2:                                                          0.00  0.00
gq:                                                           0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                           0.000
beta:                                                            0.000
ta (secs):                                                       0.000
F:                                                               0.000
f:                                                           0.000 0.000
vcmax:                                                           0     0
vcg:                                                             0     0
vcmin:                                                           0     0
tp:                                                            0.0   0.0
p:                                                               0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                   0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:    0     0     0  401     0   214  237 xxxxx xxxxx    0 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol:    0     0     0  401     0   214  237 xxxxx xxxxx    0 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900   900   900  609   900   831 1342 xxxxx xxxxx  900 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```


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```
PotentCap:   900    900    900  609    900    831 1342 xxxxx xxxxx  900 xxxxx xxxxx
                 Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0    0     85    0   73     17  153    0      0  191   46
ApproachDel:    xxxxxx             11.8            xxxxxx           xxxxxx
-----------|---------------||---------------||---------------||---------------|
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=158]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=565]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0    0     85    0   73     17  153    0      0  191   46
-----------|---------------||---------------||---------------||---------------|
Major Street Volume:            407
Minor Approach Volume:          158
Minor Approach Volume Threshold: 595
```

HCM Signalized Intersection Capacity Analysis
11: Cosumnes River Blvd & Bruceville Rd 2/22/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1562
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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1562
Volume (vph)	159	549	163	958	730	326	199	371	819	542	399	62
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	159	549	163	958	730	326	199	371	819	542	399	62
RTOR Reduction (vph)	0	0	126	0	0	169	0	0	532	0	0	45
Lane Group Flow (vph)	159	549	37	958	730	157	199	371	287	542	399	17
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	9.2	16.7	16.7	33.3	40.8	40.8	10.4	17.3	17.3	20.5	27.4	27.4
Effective Green, g (s)	8.7	17.4	17.4	32.8	41.5	41.5	9.4	18.0	18.0	19.5	28.1	28.1
Actuated g/C Ratio	0.08	0.17	0.17	0.32	0.40	0.40	0.09	0.17	0.17	0.19	0.27	0.27
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	288	853	262	1086	1416	625	311	614	477	646	959	423
v/s Ratio Prot	0.05	c0.11		c0.28	0.21		0.06	c0.10		c0.16	0.11	
v/s Ratio Perm			0.02			0.10			0.10			0.01
v/c Ratio	0.55	0.64	0.14	0.88	0.52	0.25	0.64	0.60	0.60	0.84	0.42	0.04
Uniform Delay, d1	45.6	40.3	36.8	33.6	23.5	20.7	45.5	39.6	39.5	40.6	31.1	27.9
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	1.3	1.3	0.1	8.4	0.1	0.1	3.2	1.2	1.5	9.0	0.1	0.0
Delay (s)	46.9	41.5	36.9	42.0	23.6	20.8	48.7	40.7	41.0	49.6	31.2	27.9
Level of Service	D	D	D	D	C	C	D	D	D	D	C	C
Approach Delay (s)		41.6			31.9			42.0			40.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	103.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	1571	345	0	1424	891	0	0	0	1115	0	690
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1571	345	0	1424	891	0	0	0	1115	0	690
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	22
Lane Group Flow (vph)	0	1571	345	0	1424	891	0	0	0	1115	0	668
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		55.0	100.0		54.8	100.0				34.8		34.8
Effective Green, g (s)		56.0	100.0		56.0	100.0				36.0		36.0
Actuated g/C Ratio		0.56	1.00		0.56	1.00				0.36		0.36
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2848	1583		2848	2787				1236		570
v/s Ratio Prot		c0.31			0.28							
v/s Ratio Perm			0.22			0.32				0.32		c0.42
v/c Ratio		0.55	0.22		0.50	0.32				0.90		1.17
Uniform Delay, d1		14.0	0.0		13.4	0.0				30.3		32.0
Progression Factor		1.00	1.00		0.78	1.00				1.00		1.00
Incremental Delay, d2		0.8	0.3		0.6	0.3				9.1		94.6
Delay (s)		14.8	0.3		11.0	0.3				39.4		126.6
Level of Service		B	A		B	A				D		F
Approach Delay (s)		12.2			6.9			0.0			72.8	
Approach LOS		B			A			A			E	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	2029	657	0	1939	501	376	0	401	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2029	657	0	1939	501	376	0	401	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	24	0	0	0
Lane Group Flow (vph)	0	2029	657	0	1939	501	376	0	377	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		73.1	100.0		73.4	100.0	16.3		16.3			
Effective Green, g (s)		74.4	100.0		74.4	100.0	17.6		17.6			
Actuated g/C Ratio		0.74	1.00		0.74	1.00	0.18		0.18			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3783	1550		3783	2787	604		491			
v/s Ratio Prot		c0.40			0.38							
v/s Ratio Perm			0.42			0.18	0.11		c0.14			
v/c Ratio		0.54	0.42		0.51	0.18	0.62		0.77			
Uniform Delay, d1		5.5	0.0		5.3	0.0	38.1		39.3			
Progression Factor		0.92	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.4	0.6		0.5	0.1	1.4		6.4			
Delay (s)		5.4	0.6		5.8	0.1	39.6		45.7			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		4.2			4.6			42.7			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
Baseline PM

Intersection #14: CALVINE RD / POWER INN RD

South Bound (Signal=Protect/Rights=Overlap)
Initial Vol: 736*** 490 398
Lanes: 1 0 2 0 2

East Bound (Signal=Protect, Rights=Overlap)

Initial Vol:	Lanes:
528	2
	0
1934***	3
	0
583	1

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	16
Critical V/C:	1.063
Avg Crit Del (sec/veh):	188.6
Avg Delay (sec/veh):	137.8
LOS:	F

West Bound (Signal=Protect, Rights=Overlap)

Lanes:	Initial Vol:
1	177
0	
3	1303
0	
2	171***

North Bound
Lanes: 2 0 2 0 1
Initial Vol: 503*** 274 158
Signal=Protect/Rights=Overlap

Approach:	North Bound L	T	R	South Bound L	T	R	East Bound L	T	R	West Bound L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	503	274	158	398	490	736	528	1934	583	171	1303	177
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	503	274	158	398	490	736	528	1934	583	171	1303	177
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	503	274	158	398	490	736	528	1934	583	171	1303	177
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	503	274	158	398	490	736	528	1934	583	171	1303	177
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	503	274	158	398	490	736	528	1934	583	171	1303	177
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	553	274	158	438	490	736	581	1934	583	188	1303	177
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.20	0.10	0.11	0.16	0.18	0.54	0.21	0.47	0.42	0.07	0.32	0.13
Crit Vol:	277					736		645		94		
Crit Moves:	****					****		****		****		

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Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 AM

Intersection #1: Valley Hi & Mack

Signal=Protect/Rights=Include

Initial Vol: 52 176 235***

Lanes: 0 1 1 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Initial Vol:
47	1		Vol Cnt Date:	n/a		0	145
			Cycle Time (sec):	110			
	0		Loss Time (sec):	16		1	
870***	2		Critical V/C:	0.633		1	670
	0		Avg Crit Del (sec/veh):	33.7		0	
170	1		Avg Delay (sec/veh):	32.0		2	300***
			LOS:	C			

Lanes: 2 0 1 1 1

Initial Vol: 180 186 740***

Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	10	0	4	6	0	4	26	0	4	30	0
Volume Module:												
Base Vol:	180	186	740	235	176	52	47	870	170	300	670	145
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	186	740	235	176	52	47	870	170	300	670	145
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	180	186	740	235	176	52	47	870	170	300	670	145
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	180	186	740	235	176	52	47	870	170	300	670	145
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	180	186	740	235	176	52	47	870	170	300	670	145
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	180	186	740	235	176	52	47	870	170	300	670	145
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.85	0.92	0.92	0.92
Lanes:	2.00	1.00	2.00	2.00	1.54	0.46	1.00	2.00	1.00	2.00	1.64	0.36
Final Sat.:	3502	1588	3177	3502	2692	795	1805	3610	1615	3502	2888	625
Capacity Analysis Module:												
Vol/Sat:	0.05	0.12	0.23	0.07	0.07	0.07	0.03	0.24	0.11	0.09	0.23	0.23
Crit Moves:			****	****				****		****		
Green/Cycle:	0.15	0.23	0.37	0.11	0.19	0.19	0.06	0.38	0.38	0.14	0.46	0.46
Volume/Cap:	0.34	0.50	0.63	0.63	0.34	0.34	0.43	0.63	0.28	0.63	0.51	0.51
Delay/Veh:	42.4	36.9	29.6	50.7	39.0	39.0	52.5	28.8	23.8	47.8	21.5	21.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.4	36.9	29.6	50.7	39.0	39.0	52.5	28.8	23.8	47.8	21.5	21.5
HCM2kAvg:	3	6	11	5	4	4	2	12	4	6	10	10
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	2 0	1 1	1	2 0	1 1	0	1 0	2 0	1	2 0	1 1	0
Lane Group:	L	RT	RT	L	RT	RT	L	T	R	L	RT	RT
#LnsInGrps:	2	3	3	2	2	2	1	2	1	2	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	xxxx	0.88	0.88	xxxx	0.97	0.97	xxxx	xxxx	0.85	xxxx	0.97	0.97
LT Adj:	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	0.88	0.88	0.95	0.97	0.97	0.95	1.00	0.85	0.95	0.97	0.97
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	0.95
Fnl Sat Adj:	0.92	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.85	0.92	0.92	0.92
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > >											
Street Type:	Main			Main			Side			Side		
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.15	0.23	0.37	0.11	0.19	0.19	0.06	0.38	0.38	0.14	0.46	0.46
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	2.6	4.9	9.3	3.6	3.0	3.0	1.5	10.8	3.6	4.6	8.8	8.8
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.5	1.0	1.6	1.5	0.5	0.5	0.7	1.6	0.4	1.5	1.0	1.0
HCM2KQueue:	3.1	5.9	10.9	5.1	3.5	3.5	2.2	12.5	4.0	6.1	9.9	9.9
70th%Factor:	1.19	1.19	1.18	1.19	1.19	1.19	1.19	1.17	1.19	1.19	1.18	1.18
70th%HCM2kQ:	3.7	7.0	12.9	6.1	4.2	4.2	2.6	14.6	4.7	7.2	11.6	11.6
85th%Factor:	1.57	1.55	1.51	1.55	1.57	1.57	1.58	1.50	1.56	1.54	1.52	1.52
85th%HCM2kQ:	4.9	9.1	16.5	7.9	5.5	5.5	3.4	18.7	6.2	9.4	14.9	14.9
90th%Factor:	1.74	1.70	1.63	1.71	1.74	1.74	1.76	1.61	1.73	1.70	1.64	1.64
90th%HCM2kQ:	5.4	10.0	17.9	8.7	6.1	6.1	3.8	20.2	6.9	10.3	16.2	16.2
95th%Factor:	2.00	1.93	1.83	1.95	1.99	1.99	2.03	1.80	1.98	1.93	1.85	1.85
95th%HCM2kQ:	6.2	11.4	20.0	10.0	7.0	7.0	4.4	22.5	7.9	11.7	18.2	18.2
98th%Factor:	2.49	2.33	2.13	2.38	2.46	2.46	2.55	2.08	2.44	2.33	2.17	2.17
98th%HCM2kQ:	7.7	13.8	23.3	12.1	8.7	8.7	5.5	26.0	9.7	14.2	21.4	21.4

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 AM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Include
Initial Vol: 384*** 0 0
Lanes: 2 0 0 0 0

Initial Vol:	Lanes:	Signal=Protect Rights=Ignore
0	0	
	0	
1715***	2	
	0	
180	1	

Vol Cnt Date:	n/a
Cycle Time (sec):	60
Loss Time (sec):	4
Critical V/C:	0.832
Avg Crit Del (sec/veh):	12.9
Avg Delay (sec/veh):	10.4
LOS:	B

Signal=Protect Rights=Include	Lanes:	Initial Vol:
	0	0
	0	
	2	730
	0	
	1	300***

Lanes: 0 0 0 0 1
Initial Vol: 0 0 800
Signal=Protect/Rights=Ignore

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	800	0	0	384	0	1715	180	300	730	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	800	0	0	384	0	1715	180	300	730	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	800	0	0	384	0	1715	180	300	730	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	384	0	1715	0	300	730	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	384	0	1715	0	300	730	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	384	0	1715	0	300	730	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.48	0.00	0.17	0.20	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.65	0.00	0.83	0.27	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	29.5	0.0	4.8	0.0	38.0	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	29.5	0.0	4.8	0.0	38.0	2.4	0.0
HCM2kAvg:	0	0	0	0	0	5	0	9	0	8	2	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 1			0 0 0 0 2			0 0 2 0 1			1 0 2 0 0		
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > >											
Street Type:		Main			Main			Side			Side	
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method

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Future Volume Alternative

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Intersection #2 Alta Valley & Mack

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	3.0	0.0	7.4	0.0	5.0	1.9	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	2.3	0.0	1.8	0.0	3.4	0.4	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	5.4	0.0	9.2	0.0	8.5	2.3	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.19	1.20	1.18	1.20	1.18	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	6.4	0.0	10.8	0.0	10.0	2.7	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.55	1.60	1.52	1.60	1.53	1.58	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	8.3	0.0	13.9	0.0	13.0	3.6	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.71	1.80	1.65	1.80	1.66	1.76	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	9.1	0.0	15.1	0.0	14.1	4.0	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.95	2.10	1.86	2.10	1.87	2.03	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	10.4	0.0	17.0	0.0	15.9	4.6	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.36	2.70	2.19	2.70	2.22	2.54	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	12.7	0.0	20.1	0.0	18.9	5.8	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 AM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Overlap

Initial Vol:	40		396		210***
Lanes:	1	0	2	0	1

West approach (Signal=Split, Rights=Overlap):

Initial Vol:	Lanes:
60	1
	0
40***	1!
	0
10	0

Vol Cnt Date:	n/a
Cycle Time (sec):	90
Loss Time (sec):	16
Critical V/C:	0.501
Avg Crit Del (sec/veh):	25.1
Avg Delay (sec/veh):	21.6
LOS:	C

East approach (Signal=Split, Rights=Overlap):

Lanes:	Initial Vol:
2	260
0	
0	50***
1	
1	75

Lanes:	1	0	2	0	1
Initial Vol:	25		786***		150

Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	4	0	6	6	0	0	4	0	0	4	0
Volume Module:												
Base Vol:	25	786	150	210	396	40	60	40	10	75	50	260
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	786	150	210	396	40	60	40	10	75	50	260
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	25	786	150	210	396	40	60	40	10	75	50	260
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	25	786	150	210	396	40	60	40	10	75	50	260
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	25	786	150	210	396	40	60	40	10	75	50	260
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	25	786	150	210	396	40	60	40	10	75	50	260
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.96	0.96	0.96	0.97	0.97	0.75
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.37	0.50	0.13	1.20	0.80	2.00
Final Sat.:	1805	3610	1615	1805	3610	1615	2506	911	228	2214	1476	2842
Capacity Analysis Module:												
Vol/Sat:	0.01	0.22	0.09	0.12	0.11	0.02	0.02	0.04	0.04	0.03	0.03	0.09
Crit Moves:		****		****				****			****	
Green/Cycle:	0.19	0.43	0.50	0.23	0.47	0.56	0.09	0.09	0.28	0.07	0.07	0.30
Volume/Cap:	0.07	0.50	0.18	0.50	0.23	0.04	0.27	0.50	0.16	0.50	0.50	0.30
Delay/Veh:	29.9	18.6	12.4	31.0	14.0	8.9	38.7	41.0	24.5	42.1	42.1	24.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.9	18.6	12.4	31.0	14.0	8.9	38.7	41.0	24.5	42.1	42.1	24.5
HCM2kAvg:	1	8	2	6	3	0	1	3	2	2	2	3
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		1 0 2 0 1			1 0 2 0 1			1 0 1! 0 0			1 1 0 0 2	
Lane Group:	L	T	R	L	T	R	LTR	LTR	LTR	LT	LT	R
#LnsInGrps:	1	2	1	1	2	1	2	1	1	2	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	1	xxxx	xxxx	4	4	4	4	4	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	xxxx	xxxx	1.00	xxxx	xxxx	1.00	1.00	1.00	1.00	xxxx	xxxx	1.00
Bus Stp Adj:	xxxx	xxxx	1.00	xxxx	xxxx	1.00	1.00	1.00	1.00	xxxx	xxxx	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	xxxx	xxxx	0.85	xxxx	xxxx	0.85	0.99	0.99	0.99	xxxx	xxxx	0.85
LT Adj:	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.97	0.97	0.97	0.97	0.97	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	0.85	0.95	1.00	0.85	0.96	0.96	0.96	0.97	0.97	0.85
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Fnl Sat Adj:	0.95	0.95	0.85	0.95	0.95	0.85	0.96	0.96	0.96	0.97	0.97	0.75
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.19	0.43	0.50	0.23	0.47	0.56	0.09	0.09	0.28	0.07	0.07	0.30
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.5	7.1	2.1	4.8	2.9	0.4	1.0	2.0	1.5	1.6	1.6	2.5
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	1.0	0.2	1.0	0.3	0.0	0.4	0.9	0.2	0.9	0.9	0.4
HCM2KQueue:	0.6	8.1	2.3	5.8	3.2	0.5	1.4	2.9	1.7	2.5	2.5	2.9
70th%Factor:	1.20	1.18	1.19	1.19	1.19	1.20	1.20	1.19	1.20	1.19	1.19	1.19
70th%HCM2kQ:	0.7	9.6	2.7	6.8	3.8	0.6	1.7	3.4	2.1	2.9	2.9	3.5
85th%Factor:	1.59	1.53	1.58	1.55	1.57	1.60	1.59	1.57	1.58	1.58	1.58	1.57
85th%HCM2kQ:	1.0	12.4	3.6	8.9	5.1	0.8	2.2	4.5	2.7	3.9	3.9	4.6
90th%Factor:	1.79	1.67	1.76	1.70	1.74	1.79	1.77	1.75	1.77	1.75	1.75	1.75
90th%HCM2kQ:	1.1	13.5	4.0	9.8	5.6	0.9	2.5	5.0	3.1	4.3	4.3	5.1
95th%Factor:	2.08	1.88	2.03	1.94	2.00	2.08	2.05	2.01	2.04	2.02	2.02	2.01
95th%HCM2kQ:	1.3	15.2	4.6	11.2	6.4	1.0	2.9	5.8	3.5	5.0	5.0	5.9
98th%Factor:	2.65	2.24	2.54	2.34	2.48	2.66	2.60	2.50	2.58	2.53	2.53	2.50
98th%HCM2kQ:	1.6	18.1	5.8	13.5	8.0	1.3	3.7	7.2	4.5	6.2	6.2	7.3

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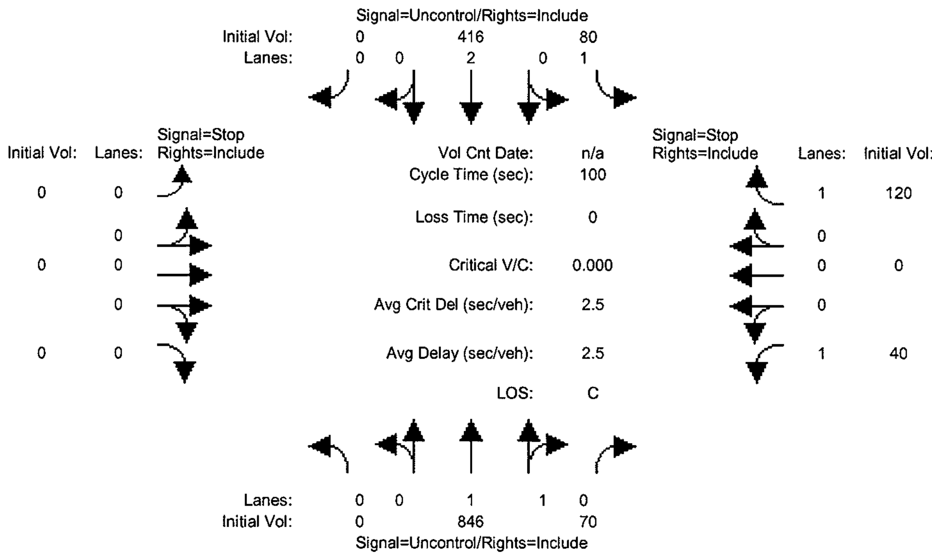
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 AM

Intersection #4: Valley Hi & Wyndham




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  846    70    80  416     0     0    0     0    40    0   120
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  846    70    80  416     0     0    0     0    40    0   120
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0  846    70    80  416     0     0    0     0    40    0   120
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  846    70    80  416     0     0    0     0    40    0   120
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  846    70    80  416     0     0    0     0    40    0   120
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   916 xxxx xxxxx  xxxx xxxx xxxxx  1249 xxxx   458
Potent Cap.: xxxx xxxx xxxxx   753 xxxx xxxxx  xxxx xxxx xxxxx   168 xxxx   555
Move Cap.:   xxxx xxxx xxxxx   753 xxxx xxxxx  xxxx xxxx xxxxx   154 xxxx   555
Volume/Cap:  xxxx xxxx  xxxx  0.11 xxxx  xxxx  xxxx xxxx  xxxx  0.26 xxxx  0.22
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.4 xxxx xxxxx xxxxx xxxx xxxxx   1.0 xxxx   0.8
Stopped Del:xxxxx xxxx xxxxx  10.3 xxxx xxxxx xxxxx xxxx xxxxx  36.3 xxxx  13.3
LOS by Move:    *    *     *     B    *     *     *    *     *     E    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx           xxxxxx            19.0
ApproachLOS:         *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                       #5
Dist(miles):                      0.000
Speed (mph):                       0.00
SignalIndex:                      #3
Cycle Time:                            0 secs
InitVolume:                    0      0
Saturation:                    0      0
ArrivalType:                   0      0
G/C:                        0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                         0.000 0.000
gq1:                        0.00  0.00
gq2:                        0.00  0.00
gq:                         0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                            0.000
beta:                             0.000
ta (secs):                        0.000
F:                                0.000
f:                         0.000 0.000
vcmax:                         0      0
vcg:                           0      0
vcmin:                         0      0
tp:                          0.0    0.0
p:                                0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:    0 xxxxx xxxxx  916 xxxxx xxxxx    0     0     0 1249     0   458
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:    0 xxxxx xxxxx  916 xxxxx xxxxx    0     0     0 1249     0   458
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx  753 xxxxx xxxxx  900   900   900  168   900   555
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```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```
PotentCap:   900 xxxxx xxxxx  753 xxxxx xxxxx  900   900   900  168   900   555
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:         0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:      0  846    70    80  416     0     0     0     0    40     0   120
ApproachDel:     xxxxxx           xxxxxx           xxxxxx              19.0
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.8]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=160]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1572]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                     Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:         0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:      0  846    70    80  416     0     0     0     0    40     0   120
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            1412
Minor Approach Volume:           160
Minor Approach Volume Threshold: 226
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 AM

Intersection #5: Alta Valley & Bruceville

Signal=Split/Rights=Overlap
Initial Vol: 60 130*** 270
Lanes: 0 1 0 1 1

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
125***	1		Vol Cnt Date:	n/a		0	250
	0		Cycle Time (sec):	80		1	
185	1		Loss Time (sec):	16		1	290***
	1		Critical V/C:	0.442		0	
90	0		Avg Crit Del (sec/veh):	25.6		1	170
			Avg Delay (sec/veh):	23.0			
			LOS:	C			

Lanes: 0 1 0 1 0
Initial Vol: 40 65*** 15
Signal=Split/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	40	65	15	270	130	60	125	185	90	170	290	250
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	65	15	270	130	60	125	185	90	170	290	250
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	65	15	270	130	60	125	185	90	170	290	250
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	40	65	15	270	130	60	125	185	90	170	290	250
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	40	65	15	270	130	60	125	185	90	170	290	250
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	40	65	15	270	130	60	125	185	90	170	290	250
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.90	0.90	0.90	0.95	0.90	0.90	0.95	0.88	0.88
Lanes:	0.67	1.08	0.25	1.76	0.85	0.39	1.00	1.35	0.65	1.00	1.07	0.93
Final Sat.:	1162	1888	436	3028	1458	673	1805	2310	1124	1805	1805	1556
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.03	0.09	0.09	0.09	0.07	0.08	0.08	0.09	0.16	0.16
Crit Moves:		****			****		****				****	
Green/Cycle:	0.08	0.08	0.36	0.20	0.20	0.36	0.16	0.24	0.32	0.28	0.36	0.57
Volume/Cap:	0.44	0.44	0.10	0.44	0.44	0.25	0.44	0.33	0.25	0.33	0.44	0.28
Delay/Veh:	36.4	36.4	17.1	28.3	28.3	18.1	31.7	25.4	20.4	23.2	19.6	9.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.4	36.4	17.1	28.3	28.3	18.1	31.7	25.4	20.4	23.2	19.6	9.1
HCM2kAvg:	2	2	1	4	4	3	3	3	3	4	5	4
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 1 0 1 0			1 1 0 1 0			1 0 1 1 0			1 0 1 1 0		
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.98	0.98	0.98	0.98	0.98	0.98	xxxx	0.95	0.95	xxxx	0.93	0.93
LT Adj:	0.98	0.98	0.98	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.97	0.97	0.97	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.92	0.92	0.92	0.90	0.90	0.90	0.95	0.90	0.90	0.95	0.88	0.88
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.08	0.08	0.36	0.20	0.20	0.36	0.16	0.24	0.32	0.28	0.36	0.57
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	1.3	1.3	0.9	3.1	3.1	2.5	2.6	2.5	2.3	3.2	4.5	3.1
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.7	0.7	0.1	0.8	0.8	0.3	0.8	0.5	0.3	0.5	0.8	0.4
HCM2KQueue:	2.0	2.0	1.0	3.8	3.8	2.8	3.4	3.0	2.6	3.7	5.3	3.5
70th%Factor:	1.20	1.20	1.20	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	2.4	2.4	1.2	4.6	4.6	3.3	4.1	3.6	3.1	4.4	6.3	4.2
85th%Factor:	1.58	1.58	1.59	1.56	1.56	1.57	1.57	1.57	1.58	1.57	1.55	1.57
85th%HCM2kQ:	3.2	3.2	1.6	6.0	6.0	4.4	5.4	4.8	4.1	5.7	8.3	5.5
90th%Factor:	1.76	1.76	1.78	1.73	1.73	1.75	1.74	1.74	1.75	1.73	1.71	1.74
90th%HCM2kQ:	3.6	3.6	1.8	6.6	6.6	4.9	5.9	5.3	4.6	6.3	9.1	6.1
95th%Factor:	2.04	2.04	2.07	1.98	1.98	2.01	2.00	2.01	2.02	1.99	1.95	1.99
95th%HCM2kQ:	4.1	4.1	2.1	7.6	7.6	5.6	6.8	6.1	5.3	7.3	10.4	7.0
98th%Factor:	2.56	2.56	2.63	2.44	2.44	2.51	2.47	2.49	2.52	2.45	2.36	2.46
98th%HCM2kQ:	5.2	5.2	2.6	9.4	9.4	7.0	8.4	7.5	6.6	9.0	12.6	8.6

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 AM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Protect/Rights=Include

Initial Vol:	260		0		310***
Lanes:	1	0	0	0	1

West approach (Signal=Protect, Rights=Include):

Initial Vol:	Lanes:
200***	1
	0
270	2
	0
0	0

Vol Cnt Date:	n/a
Cycle Time (sec):	90
Loss Time (sec):	14
Critical V/C:	0.505
Avg Crit Del (sec/veh):	27.3
Avg Delay (sec/veh):	24.1
LOS:	C

East approach (Signal=Protect, Rights=Include):

Lanes:	Initial Vol:
0	60
1	
1	450***
0	
0	0

Lanes:	0	0	0	0	0
Initial Vol:	0		0		0

Signal=Protect/Rights=Include

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0    4    0     0    4    6     0    0    6     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0  310    0   260  200  270     0    0  450    60
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  310    0   260  200  270     0    0  450    60
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  310    0   260  200  270     0    0  450    60
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0  310    0   260  200  270     0    0  450    60
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  310    0   260  200  270     0    0  450    60
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0  310    0   260  200  270     0    0  450    60
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.95 1.00  0.85 0.95 0.95  1.00 1.00 0.93  0.93
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.76  0.24
Final Sat.:     0    0     0 1805    0  1615 1805 3610     0    0 3128   417
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.17 0.00  0.16 0.11 0.07  0.00 0.00 0.14  0.14
Crit Moves:                  ****             ****                  ****
Green/Cycle: 0.00 0.00  0.00 0.34 0.00  0.34 0.22 0.50  0.00 0.00 0.28  0.28
Volume/Cap:  0.00 0.00  0.00 0.50 0.00  0.47 0.50 0.15  0.00 0.00 0.50  0.50
Delay/Veh:    0.0  0.0   0.0 24.3  0.0  24.0 31.9 12.0   0.0  0.0 27.3  27.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 24.3  0.0  24.0 31.9 12.0   0.0  0.0 27.3  27.3
HCM2kAvg:       0    0     0    7    0     6    6    2     0    0    6     6
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
Lane Group:  xxxx xxxx  xxxx    L xxxx     R    L    T  xxxx xxxx   RT    RT
#LnsInGrps:     0    0     0    1    0     1    1    2     0    0    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12   12   12    12   12   12    12   12   12    12
CrosswalkWid         8               8               8               8
% Hev Veh:           0               0               0               0
Grade:              0%              0%              0%              0%
Parking/Hr:         No              No              No              No
Bus Stp/Hr:          0               0               0               0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0               0               0               0
ExclusiveRT:     Include         Include         Include         Include
% RT Prtct:          0               0               0               0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:  xxxx xxxx  xxxx    1 xxxx  xxxx    1 xxxx  xxxx xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
Hev Veh Adj: xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
Grade Adj:   xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
Parking Adj: xxxx xxxx xxxxx xxxx xxxx  1.00 xxxx 1.00 xxxxx xxxx 1.00  1.00
Bus Stp Adj: xxxx xxxx xxxxx xxxx xxxx  1.00 xxxx 1.00 xxxxx xxxx 1.00  1.00
Area Adj:    xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
RT Adj:      xxxx xxxx xxxxx xxxx xxxx  0.85 xxxx xxxx xxxxx xxxx 0.98  0.98
LT Adj:      xxxx xxxx xxxxx 0.95 xxxx xxxxx 0.95 xxxx xxxxx xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
HCM Sat Adj: 1.00 1.00  1.00 0.95 1.00  0.85 0.95 1.00  1.00 1.00 0.98  0.98
Usr Sat Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Sat Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.95  1.00 1.00 0.95  0.95
Fnl Sat Adj: 1.00 1.00  1.00 0.95 1.00  0.85 0.95 0.95  1.00 1.00 0.93  0.93
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < No  > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr:  0.00 0.00  0.00 1.00 0.00  1.00 1.00 1.00  0.00 0.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                        Future Volume Alternative
```


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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.34	0.00	0.34	0.22	0.50	0.00	0.00	0.28	0.28
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	6.5	0.0	5.1	4.6	1.8	0.0	0.0	5.3	5.3
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	1.0	0.0	0.9	1.0	0.2	0.0	0.0	1.0	1.0
HCM2KQueue:	0.0	0.0	0.0	7.5	0.0	6.0	5.6	2.0	0.0	0.0	6.3	6.3
70th%Factor:	1.20	1.20	1.20	1.18	1.20	1.19	1.19	1.20	1.20	1.20	1.19	1.19
70th%HCM2kQ:	0.0	0.0	0.0	8.9	0.0	7.1	6.7	2.4	0.0	0.0	7.5	7.5
85th%Factor:	1.60	1.60	1.60	1.53	1.60	1.55	1.55	1.58	1.60	1.60	1.54	1.54
85th%HCM2kQ:	0.0	0.0	0.0	11.5	0.0	9.3	8.7	3.1	0.0	0.0	9.7	9.7
90th%Factor:	1.80	1.80	1.80	1.67	1.80	1.70	1.70	1.76	1.80	1.80	1.69	1.69
90th%HCM2kQ:	0.0	0.0	0.0	12.6	0.0	10.2	9.5	3.5	0.0	0.0	10.7	10.7
95th%Factor:	2.10	2.10	2.10	1.90	2.10	1.93	1.94	2.04	2.10	2.10	1.92	1.92
95th%HCM2kQ:	0.0	0.0	0.0	14.2	0.0	11.6	10.9	4.0	0.0	0.0	12.1	12.1
98th%Factor:	2.70	2.70	2.70	2.26	2.70	2.33	2.35	2.56	2.70	2.70	2.32	2.32
98th%HCM2kQ:	0.0	0.0	0.0	17.0	0.0	14.0	13.2	5.1	0.0	0.0	14.6	14.6

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 AM

Intersection #7: Bruceville / Kaiser Access

Signal=Uncontrol/Rights=Include
Initial Vol: 140 440 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Initial Vol:
30	0		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	100			
	0		Loss Time (sec):	0		0	
0	1!		Critical V/C:	0.000		0	0
	0		Avg Crit Del (sec/veh):	3.2		0	
70	0		Avg Delay (sec/veh):	3.2		0	0
			LOS:	C			

Lanes: 1 0 1 0 0
Initial Vol: 220 500 0
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     220  500     0     0  440   140    30     0    70     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  220  500     0     0  440   140    30     0    70     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:  220  500     0     0  440   140    30     0    70     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   220  500     0     0  440   140    30     0    70     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:   220  500     0     0  440   140    30     0    70     0     0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  580 xxxx xxxxx  xxxx xxxx xxxxx  1450 xxxx   290  xxxx xxxx xxxxx
Potent Cap.: 1004 xxxx xxxxx  xxxx xxxx xxxxx   146 xxxx   754  xxxx xxxx xxxxx
Move Cap.:   1004 xxxx xxxxx  xxxx xxxx xxxxx   121 xxxx   754  xxxx xxxx xxxxx
Volume/Cap:  0.22 xxxx  xxxx  xxxx xxxx  xxxx  0.25 xxxx  0.09  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  9.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  294 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.5 xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 23.5 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            23.5            xxxxxx
ApproachLOS:        *                *                C                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:        #120
Dist(miles):       0.000
Speed (mph):        0.00
SignalIndex:       #8
Cycle Time:            0 secs
InitVolume:      0      0
Saturation:      0      0
ArrivalType:     0      0
G/C:          0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:           0.000 0.000
gq1:          0.00  0.00
gq2:          0.00  0.00
gq:           0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:             0.000
beta:              0.000
ta (secs):         0.000
F:                 0.000
f:           0.000 0.000
vcmax:           0      0
vcg:             0      0
vcmin:           0      0
tp:            0.0    0.0
p:                 0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 580 xxxxx xxxxx    0 xxxxx xxxxx 1450     0   290    0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 580 xxxxx xxxxx    0 xxxxx xxxxx 1450     0   290    0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap: 1004 xxxxx xxxxx  900 xxxxx xxxxx  146   900   754  900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```


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```
PotentCap:  1004 xxxxx xxxxx  900 xxxxx xxxxx  146   900   754  900   900   900
                       Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   220  500     0     0  440   140   30     0    70     0     0     0
ApproachDel:     xxxxxx           xxxxxx             23.5            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=100]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1400]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   220  500     0     0  440   140   30     0    70     0     0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            1300
Minor Approach Volume:           100
Minor Approach Volume Threshold: 194
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 AM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 110 400*** 0
Lanes: 0 1 1 0 0

Signal=Protect Rights=Overlap
Initial Vol: Lanes:
70*** 1
0
0 0
0
120 1

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 12
Critical V/C: 0.340
Avg Crit Del (sec/veh): 23.6
Avg Delay (sec/veh): 14.7
LOS: B

Signal=Protect Rights=Include
Lanes: Initial Vol:
0 0
0
0 0
0
0 0

Lanes: 1 0 2 0 0
Initial Vol: 210*** 650 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	5	6	0	0	6	0	4	0	5	0	0	0
Volume Module:												
Base Vol:	210	650	0	0	400	110	70	0	120	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	210	650	0	0	400	110	70	0	120	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	210	650	0	0	400	110	70	0	120	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	210	650	0	0	400	110	70	0	120	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	210	650	0	0	400	110	70	0	120	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	210	650	0	0	400	110	70	0	120	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.57	0.43	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1805	3610	0	0	2741	754	1805	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.00	0.00	0.15	0.15	0.04	0.00	0.07	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green/Cycle:	0.34	0.77	0.00	0.00	0.43	0.43	0.11	0.00	0.46	0.00	0.00	0.00
Volume/Cap:	0.34	0.23	0.00	0.00	0.34	0.34	0.34	0.00	0.16	0.00	0.00	0.00
Delay/Veh:	25.8	3.4	0.0	0.0	20.0	20.0	43.5	0.0	16.7	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.8	3.4	0.0	0.0	20.0	20.0	43.5	0.0	16.7	0.0	0.0	0.0
HCM2kAvg:	5	3	0	0	5	5	2	0	2	0	0	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		1 0 2 0 0			0 0 1 1 0			1 0 0 0 1			0 0 0 0 0	
Lane Group:	L	T	xxxx	xxxx	RT	RT	L	xxxx	R	xxxx	xxxx	xxxx
#LnsInGrps:	1	2	0	0	2	2	1	0	1	0	0	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Hev Veh Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Grade Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Parking Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Bus Stp Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Area Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	0.97	0.97	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx
LT Adj:	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	1.00	1.00	0.97	0.97	0.95	1.00	0.85	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fnl Sat Adj:	0.95	0.95	1.00	1.00	0.92	0.92	0.95	1.00	0.85	1.00	1.00	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.34	0.77	0.00	0.00	0.43	0.43	0.11	0.00	0.46	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.8	2.6	0.0	0.0	4.9	4.9	2.0	0.0	2.0	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.5	0.3	0.0	0.0	0.5	0.5	0.5	0.0	0.2	0.0	0.0	0.0
HCM2KQueue:	5.3	2.9	0.0	0.0	5.4	5.4	2.5	0.0	2.2	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	6.3	3.5	0.0	0.0	6.5	6.5	2.9	0.0	2.7	0.0	0.0	0.0
85th%Factor:	1.55	1.57	1.60	1.60	1.55	1.55	1.58	1.60	1.58	1.60	1.60	1.60
85th%HCM2kQ:	8.2	4.6	0.0	0.0	8.4	8.4	3.9	0.0	3.5	0.0	0.0	0.0
90th%Factor:	1.71	1.75	1.80	1.80	1.70	1.70	1.75	1.80	1.76	1.80	1.80	1.80
90th%HCM2kQ:	9.0	5.1	0.0	0.0	9.3	9.3	4.3	0.0	3.9	0.0	0.0	0.0
95th%Factor:	1.95	2.01	2.10	2.10	1.94	1.94	2.02	2.10	2.03	2.10	2.10	2.10
95th%HCM2kQ:	10.3	5.9	0.0	0.0	10.6	10.6	5.0	0.0	4.5	0.0	0.0	0.0
98th%Factor:	2.37	2.50	2.70	2.70	2.36	2.36	2.53	2.70	2.54	2.70	2.70	2.70
98th%HCM2kQ:	12.5	7.3	0.0	0.0	12.8	12.8	6.2	0.0	5.7	0.0	0.0	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 AM

Intersection #9: Arroyo Vista & Wyndham

Signal=Stop/Rights=Include

Initial Vol:	0		0		0
Lanes:	0	0	0	0	0

Initial Vol:	Lanes:	Signal=Uncontrol Rights=Include			Signal=Uncontrol Rights=Include	Lanes:	Initial Vol:
0	0		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	100			
	0		Loss Time (sec):	0		0	
170	0		Critical V/C:	0.000		1	300
	1		Avg Crit Del (sec/veh):	1.2		0	
20	0		Avg Delay (sec/veh):	1.2		1	20
			LOS:	B			

Lanes:	0	0	1!	0	0
Initial Vol:	25		0		20

Signal=Stop/Rights=Include

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      25    0    20     0    0     0     0  170    20    20  300     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   25    0    20     0    0     0     0  170    20    20  300     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   25    0    20     0    0     0     0  170    20    20  300     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    25    0    20     0    0     0     0  170    20    20  300     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    25    0    20     0    0     0     0  170    20    20  300     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  520 xxxx   180  xxxx xxxx xxxxx  xxxx xxxx xxxxx   190 xxxx xxxxx
Potent Cap.:  520 xxxx   868  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1396 xxxx xxxxx
Move Cap.:    514 xxxx   868  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1396 xxxx xxxxx
Volume/Cap:  0.05 xxxx  0.02  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.01 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.6 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  628 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 11.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     *    *     *
ApproachDel:       11.2           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B               *                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%              0%              0%              0%
Grade:              0%              0%              0%              0%
Peds/Hour:          0               0               0               0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:      12 feet         12 feet         12 feet         12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                         #26
Dist(miles):                                                       0.000
Speed (mph):                                                        0.00
SignalIndex:                                                        #8
Cycle Time:                                                            0 secs
InitVolume:                                                      0     0
Saturation:                                                      0     0
ArrivalType:                                                     0     0
G/C:                                                          0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                           0.000 0.000
gq1:                                                          0.00  0.00
gq2:                                                          0.00  0.00
gq:                                                           0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                             0.000
beta:                                                              0.000
ta (secs):                                                         0.000
F:                                                                 0.000
f:                                                           0.000 0.000
vcmax:                                                           0     0
vcg:                                                             0     0
vcmin:                                                           0     0
tp:                                                            0.0   0.0
p:                                                                 0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 520     0   180    0     0     0     0 xxxxx xxxxx  190 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol: 520     0   180    0     0     0     0 xxxxx xxxxx  190 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  520   900   868  900   900   900   900 xxxxx xxxxx 1396 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:   520    900    868  900    900    900  900 xxxxx xxxxx 1396 xxxxx xxxxx
                      Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:         0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:     25    0    20    0    0     0    0  170    20    20  300     0
ApproachDel:       11.2           xxxxxx            xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=555]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:         0  0  1! 0  0    0  0  0  0  0    0  0  0  1  0    1  0  1  0  0
Final Vol.:     25    0    20    0    0     0    0  170    20    20  300     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            510
Minor Approach Volume:          45
Minor Approach Volume Threshold: 517
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 AM

Intersection #10: Kaiser & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 25 0 60
Lanes: 0 0 1! 0 0

Initial Vol:	Lanes:	Signal=Uncontrol Rights=Include			Signal=Uncontrol Rights=Include	Lanes:	Initial Vol:
70	1		Vol Cnt Date:	n/a		0	140
	0		Cycle Time (sec):	100		1	
130	1		Loss Time (sec):	0		0	180
	0		Critical V/C:	0.000		0	
0	0		Avg Crit Del (sec/veh):	2.7		0	0
			Avg Delay (sec/veh):	2.7			
			LOS:	B			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Stop/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    60    0    25    70  130     0     0  180   140
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    60    0    25    70  130     0     0  180   140
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0    60    0    25    70  130     0     0  180   140
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    60    0    25    70  130     0     0  180   140
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    60    0    25    70  130     0     0  180   140
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   520 xxxx   250   320 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   520 xxxx   794  1251 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   498 xxxx   794  1251 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.12 xxxx  0.03  0.06 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.0 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  559 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 12.6 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           12.6           xxxxxx           xxxxxx
ApproachLOS:        *               B               *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                        #26
Dist(miles):                                                       0.000
Speed (mph):                                                        0.00
SignalIndex:                                                       #8
Cycle Time:                                                            0 secs
InitVolume:                                                     0      0
Saturation:                                                     0      0
ArrivalType:                                                    0      0
G/C:                                                         0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                          0.000 0.000
gq1:                                                         0.00  0.00
gq2:                                                         0.00  0.00
gq:                                                          0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                             0.000
beta:                                                              0.000
ta (secs):                                                         0.000
F:                                                                 0.000
f:                                                          0.000 0.000
vcmax:                                                          0      0
vcg:                                                            0      0
vcmin:                                                          0      0
tp:                                                           0.0    0.0
p:                                                                 0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0     0     0  520     0   250  320 xxxxx xxxxx    0 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol:   0     0     0  520     0   250  320 xxxxx xxxxx    0 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900   900   900  520   900   794 1251 xxxxx xxxxx  900 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:   900   900   900  520   900   794 1251 xxxxx xxxxx  900 xxxxx xxxxx
                      Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0     0     0   60     0    25   70   130     0     0  180   140
ApproachDel:    xxxxxx              12.6            xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=85]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=605]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0     0     0   60     0    25   70   130     0     0  180   140
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            520
Minor Approach Volume:          85
Minor Approach Volume Threshold: 510
```

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.94	0.91	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
Volume (vph)	200	720	430	1800	1290	570	700	900	1430	330	630	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	720	430	1800	1290	570	700	900	1430	330	630	40
RTOR Reduction (vph)	0	0	207	0	0	132	0	0	574	0	0	30
Lane Group Flow (vph)	200	720	223	1800	1290	438	700	900	856	330	630	10
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	9.2	25.1	25.1	38.7	54.6	54.6	23.1	44.0	44.0	12.1	33.0	33.0
Effective Green, g (s)	8.7	25.8	25.8	38.2	55.3	55.3	22.1	44.7	44.7	11.1	33.7	33.7
Actuated g/C Ratio	0.06	0.19	0.19	0.28	0.41	0.41	0.16	0.33	0.33	0.08	0.25	0.25
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	220	966	296	1404	2071	635	559	1165	904	281	878	387
v/s Ratio Prot	0.06	0.14		c0.36	0.25		c0.20	0.25		0.10	0.18	
v/s Ratio Perm			0.14			c0.28			c0.31			0.01
v/c Ratio	0.91	0.75	0.75	1.28	0.62	0.69	1.25	0.77	0.95	1.17	0.72	0.03
Uniform Delay, d1	63.2	51.9	52.0	48.8	32.0	33.2	56.9	41.0	44.4	62.4	46.7	38.6
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	35.8	2.8	9.2	132.5	0.4	2.6	127.7	3.0	18.1	109.4	2.4	0.0
Delay (s)	98.9	54.7	61.2	181.3	32.4	35.8	184.6	43.9	62.5	171.8	49.0	38.6
Level of Service	F	D	E	F	C	D	F	D	E	F	D	D
Approach Delay (s)		63.3			106.2			85.2			89.1	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	90.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	2240	240	0	2650	420	0	0	0	990	0	1110
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2240	240	0	2650	420	0	0	0	990	0	1110
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2240	240	0	2650	420	0	0	0	990	0	1110
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		39.0	100.0		38.8	100.0				50.8		50.8
Effective Green, g (s)		40.0	100.0		40.0	100.0				52.0		52.0
Actuated g/C Ratio		0.40	1.00		0.40	1.00				0.52		0.52
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2034	1583		2034	2787				1785		823
v/s Ratio Prot		0.44			c0.52							
v/s Ratio Perm			0.15			0.15				0.29		c0.70
v/c Ratio		1.10	0.15		1.30	0.15				0.55		1.35
Uniform Delay, d1		30.0	0.0		30.0	0.0				16.2		24.0
Progression Factor		1.00	1.00		0.89	1.00				1.00		1.00
Incremental Delay, d2		53.7	0.2		139.0	0.1				0.2		165.0
Delay (s)		83.7	0.2		165.8	0.1				16.4		189.0
Level of Service		F	A		F	A				B		F
Approach Delay (s)		75.7			143.1			0.0			107.6	
Approach LOS		E			F			A			F	

Intersection Summary			
HCM Average Control Delay	111.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱	↰↰		↱↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	2050	1170	0	2590	1220	480	0	470	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2050	1170	0	2590	1220	480	0	470	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	2050	1170	0	2590	1220	480	0	452	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		70.3	100.0		70.6	100.0	19.1		19.1			
Effective Green, g (s)		71.6	100.0		71.6	100.0	20.4		20.4			
Actuated g/C Ratio		0.72	1.00		0.72	1.00	0.20		0.20			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3641	1550		3641	2787	700		569			
v/s Ratio Prot		0.40			0.51							
v/s Ratio Perm			c0.75			0.44	0.14		0.16			
v/c Ratio		0.56	0.75		0.71	0.44	0.69		0.80			
Uniform Delay, d1		6.8	0.0		8.2	0.0	36.8		37.8			
Progression Factor		0.74	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.2	1.3		1.2	0.5	2.2		7.1			
Delay (s)		5.2	1.3		9.4	0.5	39.1		44.9			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		3.8			6.6			41.9			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
2025 AM

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 420 480*** 350
Lanes: 1 0 2 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
500***	2		Vol Cnt Date:	n/a		1	420
			Cycle Time (sec):	100			
	0		Loss Time (sec):	16		0	
1380	3		Critical V/C:	1.415		3	2000***
	0		Avg Crit Del (sec/veh):	725.9		0	
640	1		Avg Delay (sec/veh):	439.8		2	180
			LOS:	F			

Lanes: 2 0 2 0 1
Initial Vol: 1390*** 1350 200
Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	1390	1350	200	350	480	420	500	1380	640	180	2000	420
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1390	1350	200	350	480	420	500	1380	640	180	2000	420
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1390	1350	200	350	480	420	500	1380	640	180	2000	420
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1390	1350	200	350	480	420	500	1380	640	180	2000	420
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1390	1350	200	350	480	420	500	1380	640	180	2000	420
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	1529	1350	200	385	480	420	550	1380	640	198	2000	420
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.56	0.49	0.15	0.14	0.17	0.31	0.20	0.33	0.47	0.07	0.48	0.31
Crit Vol:	765				240		275				667	
Crit Moves:	****				****		****				****	

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project AM

Intersection #1: Valley Hi & Mack

```
                         Signal=Protect/Rights=Include
            Initial Vol:     51          142            222***
                 Lanes:       0    1      1      0       2

                Signal=Protect                                    Signal=Protect
Initial Vol:  Lanes:  Rights=Include     Vol Cnt Date:      n/a    Rights=Include    Lanes:  Initial Vol:
                                     Cycle Time (sec):      110
    46          1                                                                      0         130
                                      Loss Time (sec):       16
                0                                                                      1
  859***        2                          Critical V/C:  0.577                        1         645
                0                   Avg Crit Del (sec/veh):  32.5                      0
   171          1                      Avg Delay (sec/veh):  30.8                      2         249***
                                                    LOS:      C

                 Lanes:       2    0      1      1       1
            Initial Vol:    194          164            610***
                         Signal=Protect/Rights=Overlap
```

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4   10     0     4    6     0     4   26     0     4   30     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     194  164   610   222  142    51    46  859   171   249  645   130
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  194  164   610   222  142    51    46  859   171   249  645   130
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  194  164   610   222  142    51    46  859   171   249  645   130
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   194  164   610   222  142    51    46  859   171   249  645   130
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  194  164   610   222  142    51    46  859   171   249  645   130
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   194  164   610   222  142    51    46  859   171   249  645   130
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.84  0.84  0.92 0.91  0.91  0.95 0.95  0.85  0.92 0.93  0.93
Lanes:       2.00 1.00  2.00  2.00 1.47  0.53  1.00 2.00  1.00  2.00 1.66  0.34
Final Sat.:  3502 1592  3184  3502 2550   916  1805 3610  1615  3502 2929   590
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.10  0.19  0.06 0.06  0.06  0.03 0.24  0.11  0.07 0.22  0.22
Crit Moves:             ****  ****                  ****        ****
Green/Cycle: 0.16 0.21  0.33  0.11 0.16  0.16  0.06 0.41  0.41  0.12 0.47  0.47
Volume/Cap:  0.35 0.49  0.58  0.58 0.35  0.35  0.40 0.58  0.26  0.58 0.47  0.47
Delay/Veh:   41.6 38.6  31.0  48.7 41.5  41.5  51.9 25.5  21.4  47.4 19.8  19.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  41.6 38.6  31.0  48.7 41.5  41.5  51.9 25.5  21.4  47.4 19.8  19.8
HCM2kAvg:       3    5     9     5    3     3     2   11     4     5    9     9
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         2  0  1  1  1    2  0  1  1  0    1  0  2  0  1    2  0  1  1  0
Lane Group:     L   RT    RT     L   RT    RT     L    T     R     L   RT    RT
#LnsInGrps:     2    3     3     2    2     2     1    2     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid        8                8                8                8
% Hev Veh:          0                0                0                0
Grade:             0%               0%               0%               0%
Parking/Hr:        No               No               No               No
Bus Stp/Hr:         0                0                0                0
Area Type:   < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:        0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:         0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Bus Stp Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx 0.88  0.88  xxxx 0.96  0.96  xxxx xxxx  0.85  xxxx 0.98  0.98
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 0.88  0.88  0.95 0.96  0.96  0.95 1.00  0.85  0.95 0.98  0.98
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 0.97 0.95  0.95  0.97 0.95  0.95  1.00 0.95  1.00  0.97 0.95  0.95
Fnl Sat Adj: 0.92 0.84  0.84  0.92 0.91  0.91  0.95 0.95  0.85  0.92 0.93  0.93
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < Semi-Actuated  > > > > > > > > > > > > >
Street Type:      Main             Main             Side             Side
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                      2000 HCM Operations Method
                       Future Volume Alternative
```

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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.16	0.21	0.33	0.11	0.16	0.16	0.06	0.41	0.41	0.12	0.47	0.47
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	2.8	4.4	7.7	3.4	2.6	2.6	1.4	10.1	3.4	3.8	8.0	8.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.5	0.9	1.3	1.2	0.5	0.5	0.6	1.3	0.3	1.2	0.9	0.9
HCM2KQueue:	3.3	5.4	9.0	4.6	3.1	3.1	2.1	11.4	3.8	5.0	8.9	8.9
70th%Factor:	1.19	1.19	1.18	1.19	1.19	1.19	1.19	1.18	1.19	1.19	1.18	1.18
70th%HCM2kQ:	3.9	6.4	10.6	5.5	3.8	3.8	2.5	13.4	4.5	6.0	10.5	10.5
85th%Factor:	1.57	1.55	1.52	1.56	1.57	1.57	1.58	1.50	1.56	1.55	1.52	1.52
85th%HCM2kQ:	5.2	8.3	13.7	7.2	4.9	4.9	3.2	17.2	5.9	7.8	13.5	13.5
90th%Factor:	1.74	1.71	1.66	1.72	1.74	1.74	1.76	1.63	1.73	1.71	1.66	1.66
90th%HCM2kQ:	5.7	9.1	14.9	7.9	5.5	5.5	3.6	18.6	6.5	8.6	14.7	14.7
95th%Factor:	2.00	1.95	1.86	1.96	2.00	2.00	2.04	1.82	1.99	1.95	1.87	1.87
95th%HCM2kQ:	6.6	10.4	16.8	9.1	6.3	6.3	4.2	20.8	7.5	9.8	16.5	16.5
98th%Factor:	2.48	2.36	2.20	2.40	2.49	2.49	2.55	2.11	2.45	2.38	2.21	2.21
98th%HCM2kQ:	8.2	12.6	19.8	11.1	7.8	7.8	5.3	24.2	9.2	11.9	19.6	19.6

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project AM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Include
Initial Vol: 356*** 0 0
Lanes: 2 0 0 0 0

Initial Vol:	Lanes:	Signal=Protect Rights=Ignore			Signal=Protect Rights=Include	Lanes:	Initial Vol:
0	0		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	60			
	0		Loss Time (sec):	4		0	
1553***	2		Critical V/C:	0.792		2	686
	0		Avg Crit Del (sec/veh):	14.9		0	
184	1		Avg Delay (sec/veh):	11.9		1	332***
			LOS:	B			

Lanes: 0 0 0 0 1
Initial Vol: 0 0 822
Signal=Protect/Rights=Ignore

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	822	0	0	356	0	1553	184	332	686	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	822	0	0	356	0	1553	184	332	686	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	822	0	0	356	0	1553	184	332	686	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	356	0	1553	0	332	686	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	356	0	1553	0	332	686	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	356	0	1553	0	332	686	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.43	0.00	0.18	0.19	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.59	0.00	0.92	0.25	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	27.2	0.0	4.2	0.0	51.6	2.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	27.2	0.0	4.2	0.0	51.6	2.4	0.0
HCM2kAvg:	0	0	0	0	0	5	0	8	0	11	2	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		0 0 0 0 1			0 0 0 0 2			0 0 2 0 1			1 0 2 0 0	
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > > > >											
Street Type:		Main			Main			Side			Side	
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method

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```
                              Future Volume Alternative
******************************************************************************
Intersection #2 Alta Valley & Mack
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Green/Cycle: 0.00 0.00  0.00  0.00 0.00  0.18  0.00 0.73  0.00  0.20 0.75  0.00
ArrivalType:        3                3                3                3
ProgFactor:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Q1:           0.0  0.0   0.0   0.0  0.0   2.8   0.0  6.1   0.0   5.7  1.8   0.0
UpstreamVC:  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00
UpstreamAdj: 0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00
EarlyArrAdj: 0.00 0.00  0.00  0.00 0.00  1.00  0.00 1.00  0.00  1.00 1.00  0.00
Q2:           0.0  0.0   0.0   0.0  0.0   1.9   0.0  1.4   0.0   5.0  0.3   0.0
HCM2KQueue:   0.0  0.0   0.0   0.0  0.0   4.7   0.0  7.5   0.0  10.7  2.1   0.0
------------|---------------||---------------||---------------||---------------|
70th%Factor: 1.20 1.20  1.20  1.20 1.20  1.19  1.20 1.18  1.20  1.18 1.19  1.20
70th%HCM2kQ:  0.0  0.0   0.0   0.0  0.0   5.6   0.0  8.9   0.0  12.6  2.5   0.0
------------|---------------||---------------||---------------||---------------|
85th%Factor: 1.60 1.60  1.60  1.60 1.60  1.56  1.60 1.53  1.60  1.51 1.58  1.60
85th%HCM2kQ:  0.0  0.0   0.0   0.0  0.0   7.3   0.0 11.6   0.0  16.1  3.3   0.0
------------|---------------||---------------||---------------||---------------|
90th%Factor: 1.80 1.80  1.80  1.80 1.80  1.72  1.80 1.67  1.80  1.63 1.76  1.80
90th%HCM2kQ:  0.0  0.0   0.0   0.0  0.0   8.1   0.0 12.6   0.0  17.5  3.7   0.0
------------|---------------||---------------||---------------||---------------|
95th%Factor: 2.10 2.10  2.10  2.10 2.10  1.96  2.10 1.89  2.10  1.83 2.03  2.10
95th%HCM2kQ:  0.0  0.0   0.0   0.0  0.0   9.2   0.0 14.3   0.0  19.6  4.3   0.0
------------|---------------||---------------||---------------||---------------|
98th%Factor: 2.70 2.70  2.70  2.70 2.70  2.40  2.70 2.26  2.70  2.14 2.55  2.70
98th%HCM2kQ:  0.0  0.0   0.0   0.0  0.0  11.2   0.0 17.0   0.0  22.9  5.4   0.0
```


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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project AM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Overlap

	L		T		R
Initial Vol:	40		376		196***
Lanes:	1	0	2	0	1

Signal=Split
Rights=Overlap

Initial Vol:	Lanes:
60	1
	0
41***	1!
	0
9	0

Vol Cnt Date:	n/a
Cycle Time (sec):	90
Loss Time (sec):	16
Critical V/C:	0.456
Avg Crit Del (sec/veh):	25.6
Avg Delay (sec/veh):	21.9
LOS:	C

Signal=Split
Rights=Overlap

Lanes:	Initial Vol:
2	228
0	
0	49***
1	
1	74

	L		T		R
Lanes:	1	0	2	0	1
Initial Vol:	21		682***		141

Signal=Protect/Rights=Overlap

```
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     4    4     0     6    6     0     0    4     0     0    4     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21  682   141   196  376    40    60   41     9    74   49   228
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21  682   141   196  376    40    60   41     9    74   49   228
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   21  682   141   196  376    40    60   41     9    74   49   228
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21  682   141   196  376    40    60   41     9    74   49   228
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21  682   141   196  376    40    60   41     9    74   49   228
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    21  682   141   196  376    40    60   41     9    74   49   228
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
Lanes:       1.00 2.00  1.00  1.00 2.00  1.00  1.38 0.51  0.11  1.20 0.80  2.00
Final Sat.:  1805 3610  1615  1805 3610  1615  2511  936   205  2220 1470  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.19  0.09  0.11 0.10  0.02  0.02 0.04  0.04  0.03 0.03  0.08
Crit Moves:       ****        ****                  ****              ****
Green/Cycle: 0.20 0.41  0.49  0.24 0.46  0.55  0.10 0.10  0.29  0.07 0.07  0.31
Volume/Cap:  0.06 0.46  0.18  0.46 0.23  0.04  0.25 0.46  0.15  0.46 0.46  0.26
Delay/Veh:   29.6 19.2  13.0  30.1 14.8   9.2  38.0 39.8  23.7  41.2 41.2  23.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  29.6 19.2  13.0  30.1 14.8   9.2  38.0 39.8  23.7  41.2 41.2  23.3
HCM2kAvg:       1    7     2     5    3     1     1    3     2     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         1  0  2  0  1   1  0  2  0  1   1  0  1! 0  0   1  1  0  0  2
Lane Group:     L    T     R     L    T     R   LTR  LTR   LTR    LT   LT     R
#LnsInGrps:     1    2     1     1    2     1     2    1     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:    Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx  xxxx     1 xxxx  xxxx     4    4     4     4    4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx xxxx  0.85  xxxx xxxx  0.85  0.99 0.99  0.99  xxxx xxxx  0.85
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.97 0.97  0.97  0.97 0.97 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95 1.00  0.85  0.96 0.96  0.96  0.97 0.97  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  1.00  1.00 1.00  1.00  1.00 1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
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Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.20	0.41	0.49	0.24	0.46	0.55	0.10	0.10	0.29	0.07	0.07	0.31
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.4	6.2	2.0	4.4	2.8	0.5	1.0	1.9	1.5	1.5	1.5	2.1
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	0.8	0.2	0.8	0.3	0.0	0.3	0.8	0.2	0.8	0.8	0.3
HCM2KQueue:	0.5	7.0	2.2	5.2	3.1	0.5	1.4	2.7	1.7	2.3	2.3	2.5
70th%Factor:	1.20	1.18	1.19	1.19	1.19	1.20	1.20	1.19	1.20	1.19	1.19	1.19
70th%HCM2kQ:	0.6	8.3	2.6	6.2	3.7	0.6	1.6	3.3	2.0	2.7	2.7	3.0
85th%Factor:	1.59	1.54	1.58	1.55	1.57	1.59	1.59	1.57	1.58	1.58	1.58	1.58
85th%HCM2kQ:	0.8	10.7	3.5	8.1	4.9	0.8	2.2	4.3	2.7	3.6	3.6	3.9
90th%Factor:	1.79	1.68	1.76	1.71	1.74	1.79	1.77	1.75	1.77	1.76	1.76	1.75
90th%HCM2kQ:	0.9	11.7	3.9	8.9	5.5	0.9	2.4	4.8	3.0	4.0	4.0	4.3
95th%Factor:	2.08	1.91	2.03	1.95	2.00	2.08	2.06	2.02	2.05	2.03	2.03	2.02
95th%HCM2kQ:	1.1	13.3	4.5	10.2	6.3	1.1	2.8	5.5	3.5	4.6	4.6	5.0
98th%Factor:	2.66	2.28	2.54	2.37	2.49	2.66	2.60	2.51	2.58	2.54	2.54	2.53
98th%HCM2kQ:	1.4	15.9	5.6	12.4	7.8	1.3	3.5	6.9	4.4	5.8	5.8	6.3

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline + Project AM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 408 85
Lanes: 0 0 2 0 1

Signal=Stop
Rights=Include

Initial Vol:	Lanes:
0	0
	0
0	0
	0
0	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	2.3
Avg Delay (sec/veh):	2.3
LOS:	C

Signal=Stop
Rights=Include

Lanes:	Initial Vol:
1	109
0	
0	0
0	
1	40

Lanes: 0 0 1 1 0
Initial Vol: 0 710 71
Signal=Uncontrol/Rights=Include

```
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   710    71    85   408     0     0     0     0    40     0   109
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0   710    71    85   408     0     0     0     0    40     0   109
Added Vol:     0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   0   710    71    85   408     0     0     0     0    40     0   109
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:    0   710    71    85   408     0     0     0     0    40     0   109
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:    0   710    71    85   408     0     0     0     0    40     0   109
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   781 xxxx xxxxx  xxxx xxxx xxxxx  1120 xxxx   391
Potent Cap.: xxxx xxxx xxxxx   845 xxxx xxxxx  xxxx xxxx xxxxx   204 xxxx   614
Move Cap.:   xxxx xxxx xxxxx   845 xxxx xxxxx  xxxx xxxx xxxxx   188 xxxx   614
Volume/Cap:  xxxx xxxx  xxxx  0.10 xxxx  xxxx  xxxx xxxx  xxxx  0.21 xxxx  0.18
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx   0.3 xxxx xxxxx xxxxx xxxx xxxxx   0.8 xxxx   0.6
Stopped Del:xxxxx xxxx xxxxx   9.7 xxxx xxxxx xxxxx xxxx xxxxx  29.2 xxxx  12.1
LOS by Move:   *    *    *      A    *    *     *    *    *      D    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *    *      *    *    *     *    *    *      *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            16.7
ApproachLOS:       *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:            0%               0%               0%               0%
Grade:             0%               0%               0%               0%
Peds/Hour:         0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:      12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                        #5
Dist(miles):                       0.000
Speed (mph):                        0.00
SignalIndex:                       #3
Cycle Time:                           0 secs
InitVolume:                     0     0
Saturation:                     0     0
ArrivalType:                    0     0
G/C:                         0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                          0.000 0.000
gq1:                         0.00  0.00
gq2:                         0.00  0.00
gq:                          0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                             0.000
beta:                              0.000
ta (secs):                         0.000
F:                                 0.000
f:                          0.000 0.000
vcmax:                          0     0
vcg:                            0     0
vcmin:                          0     0
tp:                           0.0   0.0
p:                                 0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0 xxxxx xxxxx  781 xxxxx xxxxx    0     0     0 1120     0   391
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:   0 xxxxx xxxxx  781 xxxxx xxxxx    0     0     0 1120     0   391
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx  845 xxxxx xxxxx  900   900   900  204   900   614
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```


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```
PotentCap:   900 xxxxx xxxxx  845 xxxxx xxxxx  900   900   900  204   900   614
                      Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  710    71    85  408     0     0    0     0    40    0   109
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             16.7
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=149]
   FAIL - Approach volume less than 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1423]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  710    71    85  408     0     0    0     0    40    0   109
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1274
Minor Approach Volume:           149
Minor Approach Volume Threshold: 270
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project AM

Intersection #5: Alta Valley & Bruceville

Signal=Split/Rights=Overlap
Initial Vol: 49 182 250***
Lanes: 0 1 0 1 1

Signal=Protect
Rights=Overlap

Initial Vol:	Lanes:
91	1
	0
148***	1
	1
104	0

Vol Cnt Date:	n/a
Cycle Time (sec):	80
Loss Time (sec):	16
Critical V/C:	0.449
Avg Crit Del (sec/veh):	28.2
Avg Delay (sec/veh):	23.4
LOS:	C

Signal=Protect
Rights=Overlap

Lanes:	Initial Vol:
0	256
1	
1	274
0	
1	260***

Lanes: 0 1 0 1 0
Initial Vol: 48 103*** 17
Signal=Split/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	48	103	17	250	182	49	91	148	104	260	274	256
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	103	17	250	182	49	91	148	104	260	274	256
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	48	103	17	250	182	49	91	148	104	260	274	256
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	48	103	17	250	182	49	91	148	104	260	274	256
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	103	17	250	182	49	91	148	104	260	274	256
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	48	103	17	250	182	49	91	148	104	260	274	256
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.89	0.89	0.95	0.88	0.88
Lanes:	0.57	1.23	0.20	1.56	1.13	0.31	1.00	1.17	0.83	1.00	1.03	0.97
Final Sat.:	1002	2150	355	2703	1968	530	1805	1989	1397	1805	1732	1618
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.05	0.09	0.09	0.09	0.05	0.07	0.07	0.14	0.16	0.16
Crit Moves:		****		****				****		****		
Green/Cycle:	0.11	0.11	0.43	0.21	0.21	0.32	0.12	0.17	0.27	0.32	0.37	0.58
Volume/Cap:	0.45	0.45	0.11	0.45	0.45	0.29	0.43	0.45	0.27	0.45	0.43	0.27
Delay/Veh:	34.4	34.4	13.8	28.1	28.1	20.2	34.2	30.6	23.0	22.1	19.1	8.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.4	34.4	13.8	28.1	28.1	20.2	34.2	30.6	23.0	22.1	19.1	8.6
HCM2kAvg:	3	3	1	4	4	3	3	3	3	6	5	3
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 1 0 1 0			1 1 0 1 0			1 0 1 1 0			1 0 1 1 0		
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.99	0.99	0.99	0.99	0.99	0.99	xxxx	0.94	0.94	xxxx	0.93	0.93
LT Adj:	0.99	0.99	0.99	0.98	0.98	0.98	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.97	0.97	0.97	0.96	0.96	0.96	0.95	0.94	0.94	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.89	0.89	0.95	0.88	0.88
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.11	0.11	0.43	0.21	0.21	0.32	0.12	0.17	0.27	0.32	0.37	0.58
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	1.8	1.8	1.1	3.2	3.2	2.7	2.0	2.5	2.2	4.8	4.4	3.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.8	0.8	0.1	0.8	0.8	0.4	0.7	0.8	0.4	0.8	0.7	0.4
HCM2KQueue:	2.5	2.5	1.3	4.0	4.0	3.1	2.7	3.3	2.6	5.6	5.1	3.3
70th%Factor:	1.19	1.19	1.20	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	3.0	3.0	1.5	4.7	4.7	3.7	3.2	3.9	3.1	6.7	6.1	4.0
85th%Factor:	1.58	1.58	1.59	1.56	1.56	1.57	1.57	1.57	1.58	1.55	1.55	1.57
85th%HCM2kQ:	4.0	4.0	2.0	6.2	6.2	4.9	4.2	5.2	4.1	8.7	8.0	5.2
90th%Factor:	1.75	1.75	1.78	1.73	1.73	1.74	1.75	1.74	1.75	1.70	1.71	1.74
90th%HCM2kQ:	4.5	4.5	2.2	6.9	6.9	5.4	4.7	5.7	4.5	9.6	8.8	5.8
95th%Factor:	2.02	2.02	2.06	1.98	1.98	2.00	2.02	2.00	2.02	1.94	1.95	2.00
95th%HCM2kQ:	5.1	5.1	2.6	7.9	7.9	6.3	5.4	6.6	5.2	10.9	10.0	6.7
98th%Factor:	2.52	2.52	2.61	2.44	2.44	2.49	2.51	2.48	2.52	2.35	2.37	2.47
98th%HCM2kQ:	6.4	6.4	3.3	9.7	9.7	7.8	6.8	8.2	6.5	13.2	12.2	8.3

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project AM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 308*** 0 307
Lanes: 1 0 0 0 1

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Initial Vol:
143***	1		Vol Cnt Date:	n/a		0	15
			Cycle Time (sec):	90			
	0		Loss Time (sec):	14		1	
271	2		Critical V/C:	0.488		1	495***
	0		Avg Crit Del (sec/veh):	26.3		0	
0	0		Avg Delay (sec/veh):	23.1		0	0
			LOS:	C			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Protect/Rights=Include

```
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    0    0     0    4    0     0    4    6     0    0    6     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0     0  307    0   308  143  271     0    0  495    15
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0  307    0   308  143  271     0    0  495    15
Added Vol:     0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0    0     0  307    0   308  143  271     0    0  495    15
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0  307    0   308  143  271     0    0  495    15
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0  307    0   308  143  271     0    0  495    15
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0  307    0   308  143  271     0    0  495    15
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.95 1.00  0.85 0.95 0.95  1.00 1.00 0.95  0.95
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.94  0.06
Final Sat.:    0    0     0 1805    0  1615 1805 3610     0    0 3490   106
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.17 0.00  0.19 0.08 0.08  0.00 0.00 0.14  0.14
Crit Moves:                             **** ****                  ****
Green/Cycle: 0.00 0.00  0.00 0.39 0.00  0.39 0.16 0.45  0.00 0.00 0.29  0.29
Volume/Cap:  0.00 0.00  0.00 0.43 0.00  0.49 0.49 0.17  0.00 0.00 0.49  0.49
Delay/Veh:    0.0  0.0   0.0 20.5  0.0  21.2 35.6 14.6   0.0  0.0 26.7  26.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 20.5  0.0  21.2 35.6 14.6   0.0  0.0 26.7  26.7
HCM2kAvg:       0    0     0    7    0     7    4    2     0    0    6     6
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
Lane Group:  xxxx xxxx  xxxx    L xxxx     R    L    T  xxxx xxxx   RT     RT
#LnsInGrps:     0    0     0    1    0     1    1    2     0    0    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12   12   12    12   12   12    12   12   12    12
CrosswalkWid        8                8                8                8
% Hev Veh:          0                0                0                0
Grade:             0%               0%               0%               0%
Parking/Hr:        No               No               No               No
Bus Stp/Hr:         0                0                0                0
Area Type:   < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:        0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:         0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:  xxxx xxxx  xxxx    1 xxxx  xxxx    1 xxxx  xxxx xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
Hev Veh Adj: xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
Grade Adj:   xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
Parking Adj: xxxx xxxx xxxxx xxxx xxxx  1.00 xxxx 1.00 xxxxx xxxx 1.00  1.00
Bus Stp Adj: xxxx xxxx xxxxx xxxx xxxx  1.00 xxxx 1.00 xxxxx xxxx 1.00  1.00
Area Adj:    xxxx xxxx xxxxx 1.00 xxxx  1.00 1.00 1.00 xxxxx xxxx 1.00  1.00
RT Adj:      xxxx xxxx xxxxx xxxx xxxx  0.85 xxxx xxxx xxxxx xxxx 1.00  1.00
LT Adj:      xxxx xxxx xxxxx 0.95 xxxx xxxxx 0.95 xxxx xxxxx xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
HCM Sat Adj: 1.00 1.00  1.00 0.95 1.00  0.85 0.95 1.00  1.00 1.00 1.00  1.00
Usr Sat Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Sat Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.95  1.00 1.00 0.95  0.95
Fnl Sat Adj: 1.00 1.00  1.00 0.95 1.00  0.85 0.95 0.95  1.00 1.00 0.95  0.95
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < <     Actuated     > > > > > > > > > > > >
DelAdjFctr:  0.00 0.00  0.00 1.00 0.00  1.00 1.00 1.00  0.00 0.00 1.00  1.00
     Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                      2000 HCM Operations Method
                       Future Volume Alternative
```

Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.39	0.00	0.39	0.16	0.45	0.00	0.00	0.29	0.29
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	5.9	0.0	5.8	3.4	2.0	0.0	0.0	5.3	5.3
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	0.8	0.0	0.9	0.9	0.2	0.0	0.0	0.9	0.9
HCM2KQueue:	0.0	0.0	0.0	6.7	0.0	6.7	4.3	2.2	0.0	0.0	6.2	6.2
70th%Factor:	1.20	1.20	1.20	1.18	1.20	1.18	1.19	1.19	1.20	1.20	1.19	1.19
70th%HCM2kQ:	0.0	0.0	0.0	7.9	0.0	8.0	5.2	2.6	0.0	0.0	7.3	7.3
85th%Factor:	1.60	1.60	1.60	1.54	1.60	1.54	1.56	1.58	1.60	1.60	1.54	1.54
85th%HCM2kQ:	0.0	0.0	0.0	10.3	0.0	10.4	6.8	3.5	0.0	0.0	9.6	9.6
90th%Factor:	1.80	1.80	1.80	1.69	1.80	1.69	1.72	1.76	1.80	1.80	1.69	1.69
90th%HCM2kQ:	0.0	0.0	0.0	11.3	0.0	11.3	7.5	3.9	0.0	0.0	10.5	10.5
95th%Factor:	2.10	2.10	2.10	1.91	2.10	1.91	1.97	2.03	2.10	2.10	1.93	1.93
95th%HCM2kQ:	0.0	0.0	0.0	12.8	0.0	12.9	8.5	4.5	0.0	0.0	11.9	11.9
98th%Factor:	2.70	2.70	2.70	2.30	2.70	2.30	2.42	2.54	2.70	2.70	2.32	2.32
98th%HCM2kQ:	0.0	0.0	0.0	15.4	0.0	15.4	10.5	5.6	0.0	0.0	14.4	14.4

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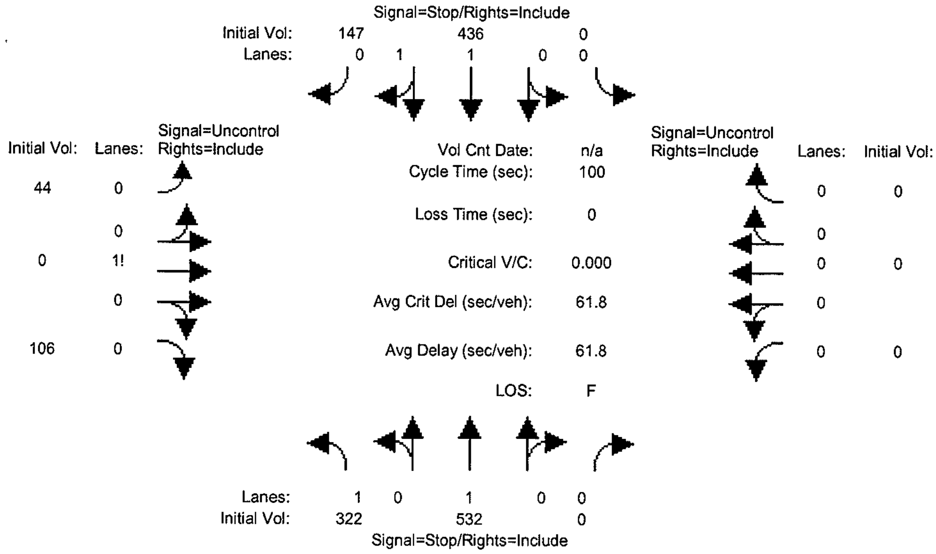
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline + Project AM

Intersection #7: Bruceville / Kaiser Access



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	322	532	0	0	436	147	44	0	106	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	322	532	0	0	436	147	44	0	106	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	322	532	0	0	436	147	44	0	106	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	322	532	0	0	436	147	44	0	106	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	322	532	0	0	436	147	44	0	106	0	0	0
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	359	141	xxxxx	xxxx	194	0	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	600	754	xxxxx	xxxx	705	900	900	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	232	716	xxxxx	xxxx	670	900	900	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	1.39	0.74	xxxx	xxxx	0.65	0.16	0.05	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	18.0	6.7	xxxxx	xxxxx	1.4	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	240.3	23.1	xxxxx	xxxxx	13.0	xxxxx	9.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	F	C	*	*	B	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	747	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	2.7	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	14.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	B	*	*	*	*	*	*
ApproachDel:		105.0			13.8			xxxxxx			xxxxxx	
ApproachLOS:		F			B			*			*	

	North Bound	South Bound	East Bound	West Bound
HevVeh:	0%	0%	0%	0%
Grade:	0%	0%	0%	0%
Peds/Hour:	0	0	0	0

Pedestrian Walk Speed: 4.00 feet/sec

LaneWidth:	12 feet	12 feet	12 feet	12 feet

Time Period: 0.25 hour

Peak Hour Delay Signal Warrant Report

Intersection #7 Bruceville / Kaiser Access

Future Volume Alternative: Peak Hour Warrant Met

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L		T		R	L		T		R	L		T		R	L		T		R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Lanes:	1	0	1	0	0	0	0	1	1	0	0	0	1!	0	0	0	0	0	0	0
Final Vol.:	322		532		0	0		436		147	44		0		106	0		0		0
ApproachDel:	105.0					13.8					xxxxxx					xxxxxx				

Approach[northbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=24.9]
SUCCEED - Vehicle-hours >= 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=854]
SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1587]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

Approach[southbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=2.2]
FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=583]
SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1587]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Bruceville / Kaiser Access

Future Volume Alternative: Peak Hour Warrant NOT Met

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Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Lanes:	1 0 1 0 0	0 0 1 1 0	0 0 1! 0 0	0 0 0 0 0
Final Vol.:	322 532 0	0 436 147	44 0 106	0 0 0

Major Street Volume: 150
Minor Approach Volume: 854
Minor Approach Volume Threshold: 889

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project AM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include

Initial Vol: 139 397*** 0
Lanes: 0 1 1 0 0

Signal=Protect Rights=Overlap

Initial Vol:	Lanes:
68***	1
	0
0	0
	0
135	1

Vol Cnt Date:	n/a
Cycle Time (sec):	104
Loss Time (sec):	12
Critical V/C:	0.370
Avg Crit Del (sec/veh):	24.0
Avg Delay (sec/veh):	14.1
LOS:	B

Signal=Protect Rights=Include

Lanes:	Initial Vol:
0	0
0	
0	0
0	
0	0

Lanes: 1 0 2 0 0
Initial Vol: 244*** 794 0
Signal=Protect/Rights=Include

```
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     5    6     0     0    6     0     4    0     5     0    0     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     244  794     0     0  397   139    68    0   135     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  244  794     0     0  397   139    68    0   135     0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  244  794     0     0  397   139    68    0   135     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   244  794     0     0  397   139    68    0   135     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  244  794     0     0  397   139    68    0   135     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   244  794     0     0  397   139    68    0   135     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  1.00  1.00 0.91  0.91  0.95 1.00  0.85  1.00 1.00  1.00
Lanes:       1.00 2.00  0.00  0.00 1.48  0.52  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:  1805 3610     0     0 2570   900  1805    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.22  0.00  0.00 0.15  0.15  0.04 0.00  0.08  0.00 0.00  0.00
Crit Moves:  ****                  ****        ****
Green/Cycle: 0.37 0.78  0.00  0.00 0.42  0.42  0.10 0.00  0.47  0.00 0.00  0.00
Volume/Cap:  0.37 0.28  0.00  0.00 0.37  0.37  0.37 0.00  0.18  0.00 0.00  0.00
Delay/Veh:   24.6  3.2   0.0   0.0 21.0  21.0  44.9  0.0  16.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  24.6  3.2   0.0   0.0 21.0  21.0  44.9  0.0  16.2   0.0  0.0   0.0
HCM2kAvg:       6    4     0     0    6     6     2    0     2     0    0     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         1  0  2  0  0    0  0  1  1  0    1  0  0  0  1    0  0  0  0  0
Lane Group:     L    T  xxxx  xxxx RT      RT     L xxxx     R  xxxx xxxx  xxxx
#LnsInGrps:     1    2     0     0    2     2     1    0     1     0    0     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:     < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx  xxxx  xxxx xxxx  xxxx     1 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Hev Veh Adj: 1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Grade Adj:   1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Parking Adj: xxxx 1.00 xxxxx  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx xxxx xxxxx
Bus Stp Adj: xxxx 1.00 xxxxx  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx xxxx xxxxx
Area Adj:    1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
RT Adj:      xxxx xxxx xxxxx  xxxx 0.96  0.96  xxxx xxxx  0.85  xxxx xxxx xxxxx
LT Adj:      0.95 xxxx xxxxx  xxxx xxxx xxxxx  0.95 xxxx xxxxx  xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  1.00  1.00 0.96  0.96  0.95 1.00  0.85  1.00 1.00  1.00
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  0.95  1.00 1.00  1.00  1.00 1.00  1.00
Fnl Sat Adj: 0.95 0.95  1.00  1.00 0.91  0.91  0.95 1.00  0.85  1.00 1.00  1.00
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:   < < < < < < < < < < < < < < No    > > > > > > > > > > > > > > > >
Signal Type:   < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
```

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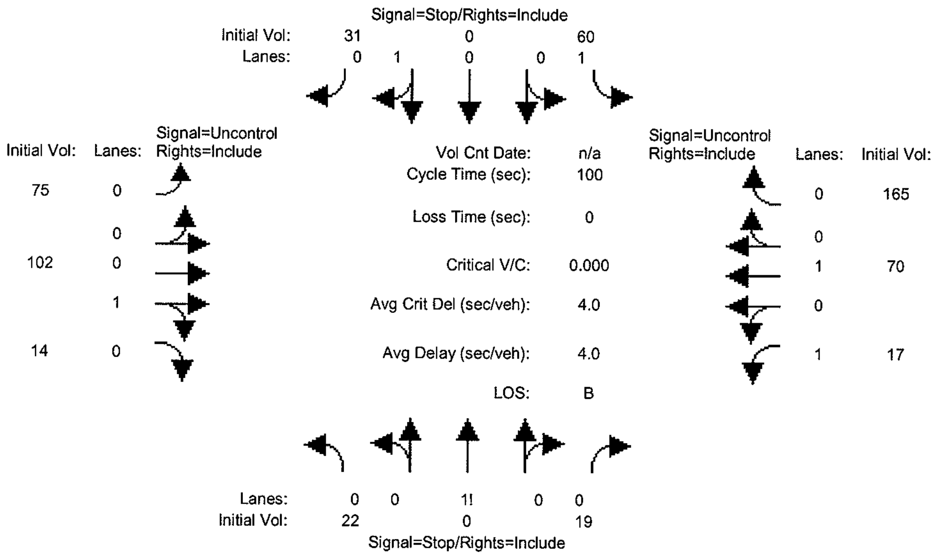
Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.37	0.78	0.00	0.00	0.42	0.42	0.10	0.00	0.47	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	5.4	3.2	0.0	0.0	5.3	5.3	1.9	0.0	2.3	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.6	0.4	0.0	0.0	0.6	0.6	0.6	0.0	0.2	0.0	0.0	0.0
HCM2KQueue:	6.0	3.6	0.0	0.0	5.9	5.9	2.5	0.0	2.5	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	7.1	4.3	0.0	0.0	7.0	7.0	3.0	0.0	3.0	0.0	0.0	0.0
85th%Factor:	1.55	1.57	1.60	1.60	1.55	1.55	1.58	1.60	1.58	1.60	1.60	1.60
85th%HCM2kQ:	9.3	5.6	0.0	0.0	9.1	9.1	3.9	0.0	3.9	0.0	0.0	0.0
90th%Factor:	1.70	1.73	1.80	1.80	1.70	1.70	1.75	1.80	1.75	1.80	1.80	1.80
90th%HCM2kQ:	10.2	6.2	0.0	0.0	10.0	10.0	4.4	0.0	4.4	0.0	0.0	0.0
95th%Factor:	1.93	1.99	2.10	2.10	1.93	1.93	2.02	2.10	2.02	2.10	2.10	2.10
95th%HCM2kQ:	11.6	7.1	0.0	0.0	11.4	11.4	5.0	0.0	5.0	0.0	0.0	0.0
98th%Factor:	2.33	2.46	2.70	2.70	2.33	2.33	2.53	2.70	2.53	2.70	2.70	2.70
98th%HCM2kQ:	14.0	8.8	0.0	0.0	13.8	13.8	6.3	0.0	6.3	0.0	0.0	0.0

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline + Project AM

Intersection #9: Arroyo Vista & Wyndham



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	22	0	19	60	0	31	75	102	14	17	70	165
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	22	0	19	60	0	31	75	102	14	17	70	165
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	22	0	19	60	0	31	75	102	14	17	70	165
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	22	0	19	60	0	31	75	102	14	17	70	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	22	0	19	60	0	31	75	102	14	17	70	165
Critical Gap Module:												
Critical Gp:	7.1	xxxx	6.2	7.1	xxxx	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	3.5	xxxx	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	461	xxxx	109	455	xxxx	153	235	xxxx	xxxxx	116	xxxx	xxxxx
Potent Cap.:	514	xxxx	950	519	xxxx	899	1344	xxxx	xxxxx	1485	xxxx	xxxxx
Move Cap.:	470	xxxx	950	482	xxxx	899	1344	xxxx	xxxxx	1485	xxxx	xxxxx
Volume/Cap:	0.05	xxxx	0.02	0.12	xxxx	0.03	0.06	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.4	xxxx	xxxxx	0.2	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	13.5	xxxx	xxxxx	7.8	xxxx	xxxxx	7.5	xxxx	xxxxx
LOS by Move:	*	*	*	B	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	614	xxxxx	xxxx	xxxx	899	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.2	xxxxx	xxxxx	xxxx	0.1	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	11.3	xxxxx	xxxxx	xxxx	9.1	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	B	*	*	*	A	*	*	*	*	*	*
ApproachDel:		11.3			12.0			xxxxxx			xxxxxx	
ApproachLOS:		B			B			*			*	

Peak Hour Delay Signal Warrant Report

****

Intersection #9 Arroyo Vista & Wyndham

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

```
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Lanes:        0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0    1  0  0  1  0
Final Vol.:    22    0    19    60    0    31    75  102    14    17   70   165
ApproachDel:        11.3              12.0           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=575]
   FAIL - Total volume less than 800 for intersection
          with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=91]
   FAIL - Approach volume less than 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=575]
   FAIL - Total volume less than 800 for intersection
          with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Lanes:        0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0    1  0  0  1  0
Final Vol.:    22    0    19    60    0    31    75  102    14    17   70   165
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            443
Minor Approach Volume:          91
Minor Approach Volume Threshold: 724
```

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1562
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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1562
Volume (vph)	200	708	119	779	648	657	102	418	770	366	222	60
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	708	119	779	648	657	102	418	770	366	222	60
RTOR Reduction (vph)	0	0	69	0	0	275	0	0	531	0	0	43
Lane Group Flow (vph)	200	708	50	779	648	382	102	418	239	366	222	17
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	10.3	19.2	19.2	33.1	42.0	42.0	6.2	18.8	18.8	15.1	27.7	27.7
Effective Green, g (s)	9.8	19.9	19.9	32.6	42.7	42.7	5.2	19.5	19.5	14.1	28.4	28.4
Actuated g/C Ratio	0.10	0.19	0.19	0.32	0.42	0.42	0.05	0.19	0.19	0.14	0.28	0.28
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	330	991	304	1096	1480	653	175	676	525	474	984	434
v/s Ratio Prot	0.06	c0.14		c0.23	0.18		0.03	c0.12		c0.11	0.06	
v/s Ratio Perm			0.03			0.24			0.09			0.01
v/c Ratio	0.61	0.71	0.16	0.71	0.44	0.59	0.58	0.62	0.46	0.77	0.23	0.04
Uniform Delay, d1	44.3	38.4	34.2	30.6	21.2	22.9	47.4	37.9	36.6	42.5	28.4	26.9
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	2.2	2.1	0.1	1.8	0.1	0.9	3.2	1.2	0.2	7.0	0.0	0.0
Delay (s)	46.5	40.5	34.3	32.4	21.2	23.8	50.6	39.1	36.8	49.4	28.4	26.9
Level of Service	D	D	C	C	C	C	D	D	D	D	C	C
Approach Delay (s)		40.9			26.2			38.6			40.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	102.1	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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	1628	216	0	1667	405	0	0	0	541	0	523
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1628	216	0	1667	405	0	0	0	541	0	523
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	13
Lane Group Flow (vph)	0	1628	216	0	1667	405	0	0	0	541	0	510
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		57.1	100.0		56.9	100.0				32.7		32.7
Effective Green, g (s)		58.1	100.0		58.1	100.0				33.9		33.9
Actuated g/C Ratio		0.58	1.00		0.58	1.00				0.34		0.34
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2954	1583		2954	2787				1164		537
v/s Ratio Prot		0.32			c0.33							
v/s Ratio Perm			0.14			0.15				0.16		c0.32
v/c Ratio		0.55	0.14		0.56	0.15				0.46		0.95
Uniform Delay, d1		12.9	0.0		13.1	0.0				25.9		32.2
Progression Factor		1.00	1.00		0.71	1.00				1.00		1.00
Incremental Delay, d2		0.7	0.2		0.7	0.1				0.1		26.7
Delay (s)		13.7	0.2		10.0	0.1				26.0		58.9
Level of Service		B	A		A	A				C		E
Approach Delay (s)		12.1			8.1			0.0			42.2	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Cosumnes River Blvd & SR-99 NB Ramps 2/22/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	1586	583	0	1613	1216	459	0	370	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1586	583	0	1613	1216	459	0	370	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	62	0	0	0
Lane Group Flow (vph)	0	1586	583	0	1613	1216	459	0	308	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		73.3	100.0		73.6	100.0	16.1		16.1			
Effective Green, g (s)		74.6	100.0		74.6	100.0	17.4		17.4			
Actuated g/C Ratio		0.75	1.00		0.75	1.00	0.17		0.17			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3793	1550		3793	2787	597		485			
v/s Ratio Prot		0.31			0.32							
v/s Ratio Perm			0.38			c0.44	c0.13		0.11			
v/c Ratio		0.42	0.38		0.43	0.44	0.77		0.64			
Uniform Delay, d1		4.7	0.0		4.7	0.0	39.4		38.4			
Progression Factor		0.79	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.3	0.6		0.4	0.5	5.3		2.0			
Delay (s)		4.0	0.6		5.1	0.5	44.7		40.4			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		3.1			3.1			42.8			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
Baseline + Project AM

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 406*** 195 156
Lanes: 1 0 2 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
			Vol Cnt Date:	n/a			
			Cycle Time (sec):	100			
475***	2					1	329
			Loss Time (sec):	16			
	0					0	
931	3		Critical V/C:	0.973		3	1702***
	0		Avg Crit Del (sec/veh):	118.3		0	
603	1		Avg Delay (sec/veh):	77.8		2	168
			LOS:	E			

Lanes: 2 0 2 0 1
Initial Vol: 664*** 764 149
Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	664	764	149	156	195	406	475	931	603	168	1702	329
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	664	764	149	156	195	406	475	931	603	168	1702	329
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	664	764	149	156	195	406	475	931	603	168	1702	329
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	664	764	149	156	195	406	475	931	603	168	1702	329
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	664	764	149	156	195	406	475	931	603	168	1702	329
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	730	764	149	172	195	406	522	931	603	185	1702	329
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.27	0.28	0.11	0.06	0.07	0.30	0.19	0.23	0.44	0.07	0.41	0.24
Crit Vol:	365					406	0				567	
Crit Moves:	****					****	****				****	

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project PM

Intersection #1: Valley Hi & Mack

Signal=Protect/Rights=Include
Initial Vol: 124 220 465***
Lanes: 0 1 1 0 2

Signal=Protect
Rights=Include

Initial Vol:	Lanes:
113***	1
	0
1111	2
	0
195	1

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	16
Critical V/C:	0.756
Avg Crit Del (sec/veh):	36.2
Avg Delay (sec/veh):	35.4
LOS:	D

Signal=Protect
Rights=Include

Lanes:	Initial Vol:
0	285
1	
1	885***
0	
2	430

Lanes: 2 0 1 1 1
Initial Vol: 356 166*** 420
Signal=Protect/Rights=Overlap

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     4   10     0     4    6     0     4   26     0     4   38     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     356  166   420   465  220   124   113 1111   195   430  885   285
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  356  166   420   465  220   124   113 1111   195   430  885   285
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  356  166   420   465  220   124   113 1111   195   430  885   285
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   356  166   420   465  220   124   113 1111   195   430  885   285
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  356  166   420   465  220   124   113 1111   195   430  885   285
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   356  166   420   465  220   124   113 1111   195   430  885   285
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.85  0.85  0.92 0.90  0.90  0.95 0.95  0.85  0.92 0.91  0.91
Lanes:       2.00 1.00  2.00  2.00 1.28  0.72  1.00 2.00  1.00  2.00 1.51  0.49
Final Sat.:  3502 1610  3220  3502 2184  1231  1805 3610  1615  3502 2630   847
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.10  0.13  0.13 0.10  0.10  0.06 0.31  0.12  0.12 0.34  0.34
Crit Moves:       ****        ****             ****                   ****
Green/Cycle: 0.16 0.14  0.29  0.18 0.16  0.16  0.08 0.38  0.38  0.15 0.45  0.45
Volume/Cap:  0.65 0.76  0.45  0.76 0.65  0.65  0.76 0.82  0.32  0.82 0.76  0.76
Delay/Veh:   42.3 45.9  29.5  44.5 42.5  42.5  64.5 31.9  22.3  50.7 25.4  25.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  42.3 45.9  29.5  44.5 42.5  42.5  64.5 31.9  22.3  50.7 25.4  25.4
HCM2kAvg:       7    7     6     9    6     6     5   17     4     9   16    16
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         2  0  1  1  1   2  0  1  1  0   1  0  2  0  1   2  0  1  1  0
Lane Group:     L   RT    RT     L   RT    RT     L    T     R     L   RT    RT
#LnsInGrps:      2    3     3     2    2     2     1    2     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:   < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Bus Stp Adj: xxxx 1.00  1.00  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx 1.00  1.00
Area Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:      xxxx 0.89  0.89  xxxx 0.95  0.95  xxxx xxxx  0.85  xxxx 0.96  0.96
LT Adj:      0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 0.89  0.89  0.95 0.95  0.95  0.95 1.00  0.85  0.95 0.96  0.96
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 0.97 0.95  0.95  0.97 0.95  0.95  1.00 0.95  1.00  0.97 0.95  0.95
Fnl Sat Adj: 0.92 0.85  0.85  0.92 0.90  0.90  0.95 0.95  0.85  0.92 0.91  0.91
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < <    Actuated     > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                          2000 HCM Operations Method
                          Future Volume Alternative
********************************************************************************
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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.16	0.14	0.29	0.18	0.16	0.16	0.08	0.38	0.38	0.15	0.45	0.45
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.9	4.4	4.8	6.5	4.5	4.5	3.2	13.9	3.8	6.1	13.6	13.6
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	1.6	2.3	0.8	2.5	1.6	1.6	2.1	3.6	0.5	3.0	2.8	2.8
HCM2KQueue:	6.5	6.7	5.6	8.9	6.1	6.1	5.4	17.5	4.3	9.1	16.4	16.4
70th%Factor:	1.18	1.18	1.19	1.18	1.19	1.19	1.19	1.16	1.19	1.18	1.17	1.17
70th%HCM2kQ:	7.7	8.0	6.6	10.5	7.2	7.2	6.4	20.4	5.1	10.7	19.1	19.1
85th%Factor:	1.54	1.54	1.55	1.52	1.54	1.54	1.55	1.47	1.56	1.52	1.47	1.47
85th%HCM2kQ:	10.1	10.4	8.7	13.6	9.4	9.4	8.3	25.6	6.7	13.8	24.1	24.1
90th%Factor:	1.69	1.69	1.70	1.66	1.69	1.69	1.71	1.57	1.72	1.65	1.58	1.58
90th%HCM2kQ:	11.0	11.4	9.5	14.8	10.4	10.4	9.2	27.4	7.4	15.0	25.8	25.8
95th%Factor:	1.92	1.91	1.94	1.87	1.93	1.93	1.95	1.73	1.97	1.86	1.74	1.74
95th%HCM2kQ:	12.5	12.9	10.9	16.7	11.8	11.8	10.5	30.2	8.5	16.9	28.5	28.5
98th%Factor:	2.31	2.30	2.35	2.20	2.33	2.33	2.36	1.96	2.42	2.20	1.98	1.98
98th%HCM2kQ:	15.0	15.5	13.2	19.7	14.2	14.2	12.7	34.3	10.4	20.0	32.5	32.5

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project PM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Overlap
Initial Vol: 530*** 0 0
Lanes: 2 0 0 0 0

West side: Initial Vol	Lanes	Signal=Protect Rights=Ignore
0	0	
	0	
1825***	2	
	0	
181	1	

Vol Cnt Date: n/a
Cycle Time (sec): 60
Loss Time (sec): 8
Critical V/C: 1.099
Avg Crit Del (sec/veh): 35.6
Avg Delay (sec/veh): 26.3
LOS: C

Signal=Protect Rights=Include	Lanes	Initial Vol
	0	0
	0	
	2	1182
	0	
	1	470***

Lanes: 0 0 0 0 1
Initial Vol: 0 0 1782
Signal=Protect/Rights=Ignore

Approach:	North Bound L	North Bound T	North Bound R	South Bound L	South Bound T	South Bound R	East Bound L	East Bound T	East Bound R	West Bound L	West Bound T	West Bound R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	1782	0	0	530	0	1825	181	470	1182	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	1782	0	0	530	0	1825	181	470	1182	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	1782	0	0	530	0	1825	181	470	1182	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	530	0	1825	0	470	1182	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	530	0	1825	0	470	1182	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	530	0	1825	0	470	1182	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.51	0.00	0.26	0.33	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.67	0.00	1.08	0.47	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	94.8	0.0	4.1	0.0	90.8	4.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	94.8	0.0	4.1	0.0	90.8	4.2	0.0
HCM2kAvg:	0	0	0	0	0	12	0	9	0	19	5	0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project PM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 73 526 169***
Lanes: 1 0 2 0 1

Initial Vol:	Lanes:	Signal=Split Rights=Include			Signal=Split Rights=Include	Lanes:	Initial Vol:
54	1					2	410***
	0		Vol Cnt Date:	n/a		0	
34***	1!		Cycle Time (sec):	90		0	81
	0		Loss Time (sec):	16		1	
12	0		Critical V/C:	0.503		1	234
			Avg Crit Del (sec/veh):	29.9			
			Avg Delay (sec/veh):	26.9			
			LOS:	C			

Lanes: 1 0 2 0 1
Initial Vol: 19 488*** 84
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	4	0	6	6	0	0	4	0	0	4	0
Volume Module:												
Base Vol:	19	488	84	169	526	73	54	34	12	234	81	410
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	19	488	84	169	526	73	54	34	12	234	81	410
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	19	488	84	169	526	73	54	34	12	234	81	410
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	19	488	84	169	526	73	54	34	12	234	81	410
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	488	84	169	526	73	54	34	12	234	81	410
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	19	488	84	169	526	73	54	34	12	234	81	410
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.96	0.96	0.96	0.96	0.96	0.75
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.37	0.47	0.16	1.49	0.51	2.00
Final Sat.:	1805	3610	1615	1805	3610	1615	2489	846	299	2721	942	2842
Capacity Analysis Module:												
Vol/Sat:	0.01	0.14	0.05	0.09	0.15	0.05	0.02	0.04	0.04	0.09	0.09	0.14
Crit Moves:		****		****				****				****
Green/Cycle:	0.11	0.27	0.27	0.19	0.35	0.35	0.08	0.08	0.08	0.29	0.29	0.29
Volume/Cap:	0.10	0.50	0.19	0.50	0.42	0.13	0.27	0.50	0.50	0.30	0.30	0.50
Delay/Veh:	36.5	28.2	25.6	34.1	22.6	20.1	39.3	41.7	41.7	25.2	25.2	27.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.5	28.2	25.6	34.1	22.6	20.1	39.3	41.7	41.7	25.2	25.2	27.2
HCM2kAvg:	1	6	2	5	6	1	1	3	3	4	4	5

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline + Project PM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 613 120
Lanes: 0 0 2 0 1

Signal=Stop Rights=Include (west side)
Initial Vol: Lanes:
0 0
0
0 0
0
0 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 3.8
Avg Delay (sec/veh): 3.8
LOS: C

Signal=Stop Rights=Include (east side)
Lanes: Initial Vol:
1 162
0
0 0
0
1 87

Lanes: 0 0 1 1 0
Initial Vol: 0 429 47
Signal=Uncontrol/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	429	47	120	613	0	0	0	0	87	0	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	429	47	120	613	0	0	0	0	87	0	162
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	429	47	120	613	0	0	0	0	87	0	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	429	47	120	613	0	0	0	0	87	0	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	429	47	120	613	0	0	0	0	87	0	162
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.8	xxxx	6.9
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	476	xxxx	xxxxx	xxxx	xxxx	xxxxx	999	xxxx	238
Potent Cap.:	xxxx	xxxx	xxxxx	1097	xxxx	xxxxx	xxxx	xxxx	xxxxx	244	xxxx	769
Move Cap.:	xxxx	xxxx	xxxxx	1097	xxxx	xxxxx	xxxx	xxxx	xxxxx	223	xxxx	769
Volume/Cap:	xxxx	xxxx	xxxx	0.11	xxxx	xxxx	xxxx	xxxx	xxxx	0.39	xxxx	0.21
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	1.7	xxxx	0.8
Stopped Del:	xxxxx	xxxx	xxxxx	8.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	31.1	xxxx	10.9
LOS by Move:	*	*	*	A	*	*	*	*	*	D	*	B
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			18.0	
ApproachLOS:		*			*			*			C	

Peak Hour Delay Signal Warrant Report

****

Intersection #4 Valley Hi & Wyndham

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

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```
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  429    47   120  613     0     0     0     0    87     0   162
ApproachDel:     xxxxxx            xxxxxx            xxxxxx              18.0
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.2]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=249]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1458]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  429    47   120  613     0     0     0     0    87     0   162
------------|---------------||---------------||---------------||---------------|
Major Street Volume:           1209
Minor Approach Volume:          249
Minor Approach Volume Threshold: 292
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project PM

Intersection #5: Alta Valley & Bruceville

Signal=Split/Rights=Include
Initial Vol: 120*** 94 328
Lanes: 0 1 0 1 1

Westbound/Eastbound approaches:

Initial Vol:	Lanes:	Signal=Split Rights=Include			Signal=Split Rights=Include	Lanes:	Initial Vol:
63	1		Vol Cnt Date:	n/a		0	403***
	0		Cycle Time (sec):	80		1	
208***	1		Loss Time (sec):	16		1	394
	1		Critical V/C:	0.734		0	
43	0		Avg Crit Del (sec/veh):	32.4		1	87
			Avg Delay (sec/veh):	31.9			
			LOS:	C			

Lanes: 0 1 0 1 0
Initial Vol: 113 322*** 142
Signal=Split/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	113	322	142	328	94	120	63	208	43	87	394	403
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	113	322	142	328	94	120	63	208	43	87	394	403
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	113	322	142	328	94	120	63	208	43	87	394	403
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	113	322	142	328	94	120	63	208	43	87	394	403
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	113	322	142	328	94	120	63	208	43	87	394	403
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	113	322	142	328	94	120	63	208	43	87	394	403
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.91	0.91	0.89	0.89	0.89	0.95	0.93	0.93	0.95	0.88	0.88
Lanes:	0.39	1.12	0.49	1.82	0.52	0.66	1.00	1.66	0.34	1.00	1.00	1.00
Final Sat.:	674	1921	847	3077	882	1126	1805	2914	602	1805	1668	1668
Capacity Analysis Module:												
Vol/Sat:	0.17	0.17	0.17	0.11	0.11	0.11	0.03	0.07	0.07	0.05	0.24	0.24
Crit Moves:		****				****		****				****
Green/Cycle:	0.23	0.23	0.23	0.15	0.15	0.15	0.10	0.10	0.10	0.33	0.33	0.33
Volume/Cap:	0.73	0.73	0.73	0.73	0.73	0.73	0.36	0.73	0.73	0.15	0.72	0.73
Delay/Veh:	32.2	32.2	32.2	36.5	36.5	36.5	35.0	43.1	43.1	19.0	25.9	26.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.2	32.2	32.2	36.5	36.5	36.5	35.0	43.1	43.1	19.0	25.9	26.4
HCM2kAvg:	8	8	8	6	6	6	2	5	5	2	10	10

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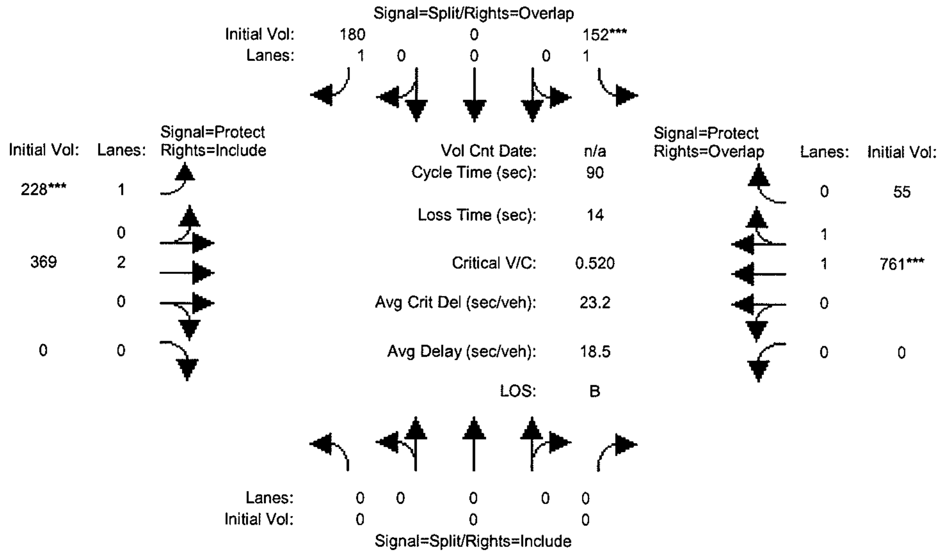
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project PM

Intersection #6: SR 99 SB Ramps & Bruceville



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	4	0	0	4	6	0	0	6	0
Volume Module:												
Base Vol:	0	0	0	152	0	180	228	369	0	0	761	55
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	152	0	180	228	369	0	0	761	55
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	152	0	180	228	369	0	0	761	55
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	152	0	180	228	369	0	0	761	55
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	152	0	180	228	369	0	0	761	55
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	152	0	180	228	369	0	0	761	55
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.94	0.94
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.87	0.13
Final Sat.:	0	0	0	1805	0	1615	1805	3610	0	0	3333	241
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.11	0.13	0.10	0.00	0.00	0.23	0.23
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.16	0.00	0.41	0.24	0.68	0.00	0.00	0.44	0.60
Volume/Cap:	0.00	0.00	0.00	0.52	0.00	0.28	0.52	0.15	0.00	0.00	0.52	0.38
Delay/Veh:	0.0	0.0	0.0	36.2	0.0	18.2	30.6	5.1	0.0	0.0	18.6	9.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	36.2	0.0	18.2	30.6	5.1	0.0	0.0	18.6	9.4
HCM2kAvg:	0	0	0	5	0	3	6	2	0	0	8	6

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline + Project PM

Intersection #7: Bruceville / Kaiser Access

Signal=Uncontrol/Rights=Include
Initial Vol: 101 507 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Initial Vol:
156	1		Vol Cnt Date:	n/a		0	0
	0		Cycle Time (sec):	100		0	
0	0		Loss Time (sec):	0		0	0
	0		Critical V/C:	0.000		0	
265	1		Avg Crit Del (sec/veh):	24.2		0	0
			Avg Delay (sec/veh):	24.2			
			LOS:	F			

Lanes: 1 0 1 0 0
Initial Vol: 153 633 0
Signal=Uncontrol/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	153	633	0	0	507	101	156	0	265	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	153	633	0	0	507	101	156	0	265	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	153	633	0	0	507	101	156	0	265	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	153	633	0	0	507	101	156	0	265	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	153	633	0	0	507	101	156	0	265	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	608	xxxx	xxxxx	xxxx	xxxx	xxxxx	1497	xxxx	304	xxxx	xxxx	xxxxx
Potent Cap.:	980	xxxx	xxxxx	xxxx	xxxx	xxxxx	136	xxxx	740	xxxx	xxxx	xxxxx
Move Cap.:	980	xxxx	xxxxx	xxxx	xxxx	xxxxx	120	xxxx	740	xxxx	xxxx	xxxxx
Volume/Cap:	0.16	xxxx	xxxx	xxxx	xxxx	xxxx	1.30	xxxx	0.36	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	0.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	10.2	xxxx	1.6	xxxxx	xxxx	xxxxx
Stopped Del:	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	250.5	xxxx	12.5	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	F	*	B	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			100.7			xxxxxx	
ApproachLOS:		*			*			F			*	

Peak Hour Delay Signal Warrant Report

****

Intersection #7 Bruceville / Kaiser Access

****

Future Volume Alternative: Peak Hour Warrant Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R

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```
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    1  0  0  0  1    0  0  0  0  0
Final Vol.:   153  633     0     0  507   101   156    0   265    0     0     0
ApproachDel:     xxxxxx           xxxxxx           100.7           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=11.8]
   SUCCEED - Vehicle-hours >= 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=421]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1815]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Lanes:        1  0  1  0  0    0  0  1  1  0    1  0  0  0  1    0  0  0  0  0
Final Vol.:   153  633     0     0  507   101   156    0   265    0     0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1394
Minor Approach Volume:           421
Minor Approach Volume Threshold: 231
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Baseline + Project PM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 221 558*** 0
Lanes: 0 1 1 0 0

Initial Vol: Lanes: Signal=Protect Rights=Overlap
116*** 1
0
0 0
0
208 1

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 12
Critical V/C: 0.430
Avg Crit Del (sec/veh): 21.5
Avg Delay (sec/veh): 15.9
LOS: B

Signal=Protect Rights=Include Lanes: Initial Vol:
0 0
0
0 0
0
0 0

Lanes: 1 0 2 0 0
Initial Vol: 164*** 676 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	5	6	0	0	6	0	4	0	5	0	0	0
Volume Module:												
Base Vol:	164	676	0	0	558	221	116	0	208	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	164	676	0	0	558	221	116	0	208	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	164	676	0	0	558	221	116	0	208	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	164	676	0	0	558	221	116	0	208	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	164	676	0	0	558	221	116	0	208	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	164	676	0	0	558	221	116	0	208	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.91	0.91	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.43	0.57	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1805	3610	0	0	2475	980	1805	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.09	0.19	0.00	0.00	0.23	0.23	0.06	0.00	0.13	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green/Cycle:	0.21	0.74	0.00	0.00	0.52	0.52	0.15	0.00	0.36	0.00	0.00	0.00
Volume/Cap:	0.43	0.25	0.00	0.00	0.43	0.43	0.43	0.00	0.36	0.00	0.00	0.00
Delay/Veh:	36.4	4.5	0.0	0.0	15.4	15.4	41.3	0.0	24.8	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.4	4.5	0.0	0.0	15.4	15.4	41.3	0.0	24.8	0.0	0.0	0.0
HCM2kAvg:	5	4	0	0	8	8	4	0	5	0	0	0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Baseline + Project PM

Intersection #9: Arroyo Vista & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 101 0 106
Lanes: 0 1 0 0 1

Signal=Uncontrol
Rights=Include
Initial Vol: Lanes:
22 0
0
197 0
1
35 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 4.7
Avg Delay (sec/veh): 4.7
LOS: B

Signal=Uncontrol
Rights=Include
Lanes: Initial Vol:
0 61
0
1 166
0
1 27

Lanes: 0 0 1! 0 0
Initial Vol: 24 0 19
Signal=Stop/Rights=Include

```
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      24     0    19   106     0   101    22   197    35    27   166    61
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   24     0    19   106     0   101    22   197    35    27   166    61
Added Vol:      0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   24     0    19   106     0   101    22   197    35    27   166    61
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:    24     0    19   106     0   101    22   197    35    27   166    61
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:    24     0    19   106     0   101    22   197    35    27   166    61
Critical Gap Module:
Critical Gp:  7.1  xxxx   6.2   7.1  xxxx   6.2   4.1  xxxx xxxxx   4.1  xxxx xxxxx
FollowUpTim:  3.5  xxxx   3.3   3.5  xxxx   3.3   2.2  xxxx xxxxx   2.2  xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  560  xxxx   215   518  xxxx   197   227  xxxx xxxxx   232  xxxx xxxxx
Potent Cap.:  442  xxxx   831   471  xxxx   850  1353  xxxx xxxxx  1348  xxxx xxxxx
Move Cap.:    379  xxxx   831   447  xxxx   850  1353  xxxx xxxxx  1348  xxxx xxxxx
Volume/Cap:  0.06  xxxx  0.02  0.24  xxxx  0.12  0.02  xxxx  xxxx  0.02  xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  xxxx xxxxx   0.9  xxxx xxxxx   0.0  xxxx xxxxx   0.1  xxxx xxxxx
Stopped Del:xxxxx  xxxx xxxxx  15.5  xxxx xxxxx   7.7  xxxx xxxxx   7.7  xxxx xxxxx
LOS by Move:    *     *     *     C     *     *     A     *     *     A     *     *
Movement:      LT -  LTR -  RT   LT -  LTR -  RT   LT -  LTR -  RT   LT -  LTR -  RT
Shared Cap.: xxxx   499 xxxxx  xxxx  xxxx   850  xxxx  xxxx xxxxx  xxxx  xxxx xxxxx
SharedQueue:xxxxx   0.3 xxxxx xxxxx  xxxx   0.4 xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shrd StpDel:xxxxx  12.9 xxxxx xxxxx  xxxx   9.8 xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shared LOS:     *     B     *     *     *     A     *     *     *     *     *     *
ApproachDel:       12.9              12.7             xxxxxx            xxxxxx
ApproachLOS:         B                 B                 *                 *
                        Peak Hour Delay Signal Warrant Report
**********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
```

```
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign         Stop Sign       Uncontrolled      Uncontrolled
Lanes:       0  0  1! 0  0   1  0  0  1  0   0  0  1! 0  0   1  0  0  1  0
Final Vol.:    24    0    19  106    0   101   22  197    35   27  166    61
ApproachDel:      12.9              12.7           xxxxxx            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=43]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=758]
   FAIL - Total volume less than 800 for intersection
          with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=207]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=758]
   FAIL - Total volume less than 800 for intersection
          with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign         Stop Sign       Uncontrolled      Uncontrolled
Lanes:       0  0  1! 0  0   1  0  0  1  0   0  0  1! 0  0   1  0  0  1  0
Final Vol.:    24    0    19  106    0   101   22  197    35   27  166    61
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            508
Minor Approach Volume:          207
Minor Approach Volume Threshold: 665
```


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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1561
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	5085	1561	3433	3539	1561	3433	3539	2748	3433	3539	1561
Volume (vph)	164	549	163	958	730	376	199	390	819	638	442	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	164	549	163	958	730	376	199	390	819	638	442	74
RTOR Reduction (vph)	0	0	127	0	0	203	0	0	528	0	0	51
Lane Group Flow (vph)	164	549	36	958	730	173	199	390	291	638	442	23
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	9.7	17.5	17.5	32.9	40.7	40.7	10.8	18.4	18.4	26.0	33.6	33.6
Effective Green, g (s)	9.2	18.2	18.2	32.4	41.4	41.4	9.8	19.1	19.1	25.0	34.3	34.3
Actuated g/C Ratio	0.08	0.16	0.16	0.29	0.37	0.37	0.09	0.17	0.17	0.23	0.31	0.31
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	285	836	257	1005	1324	584	304	611	474	775	1097	484
v/s Ratio Prot	0.05	c0.11		c0.28	0.21		0.06	c0.11		c0.19	0.12	
v/s Ratio Perm			0.02			0.11			0.11			0.01
v/c Ratio	0.58	0.66	0.14	0.95	0.55	0.30	0.65	0.64	0.61	0.82	0.40	0.05
Uniform Delay, d1	48.9	43.3	39.6	38.4	27.3	24.4	48.8	42.6	42.4	40.7	30.1	26.8
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	1.7	1.4	0.1	17.9	0.3	0.1	3.8	1.6	1.7	6.7	0.1	0.0
Delay (s)	50.6	44.8	39.6	56.3	27.6	24.5	52.6	44.2	44.1	47.5	30.2	26.8
Level of Service	D	D	D	E	C	C	D	D	D	D	C	C
Approach Delay (s)		44.9			40.4			45.3			39.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱				↰↰		↱
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	1610	396	0	1474	891	0	0	0	1115	0	690
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1610	396	0	1474	891	0	0	0	1115	0	690
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	1610	396	0	1474	891	0	0	0	1115	0	670
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		55.0	100.0		54.8	100.0				34.8		34.8
Effective Green, g (s)		56.0	100.0		56.0	100.0				36.0		36.0
Actuated g/C Ratio		0.56	1.00		0.56	1.00				0.36		0.36
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2848	1583		2848	2787				1236		570
v/s Ratio Prot		c0.32			0.29							
v/s Ratio Perm			0.25			0.32				0.32		c0.42
v/c Ratio		0.57	0.25		0.52	0.32				0.90		1.18
Uniform Delay, d1		14.2	0.0		13.6	0.0				30.3		32.0
Progression Factor		1.00	1.00		0.77	1.00				1.00		1.00
Incremental Delay, d2		0.8	0.4		0.6	0.3				9.1		96.4
Delay (s)		15.0	0.4		11.0	0.3				39.4		128.4
Level of Service		B	A		B	A				D		F
Approach Delay (s)		12.1			7.0			0.0			73.5	
Approach LOS		B			A			A			E	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Cosumnes River Blvd & SR-99 NB Ramps

2/22/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	2068	657	0	1956	501	409	0	401	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2068	657	0	1956	501	409	0	401	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	0	2068	657	0	1956	501	409	0	380	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		73.0	100.0		73.3	100.0	16.4		16.4			
Effective Green, g (s)		74.3	100.0		74.3	100.0	17.7		17.7			
Actuated g/C Ratio		0.74	1.00		0.74	1.00	0.18		0.18			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3778	1550		3778	2787	608		493			
v/s Ratio Prot		c0.41			0.38							
v/s Ratio Perm			0.42			0.18	0.12		c0.14			
v/c Ratio		0.55	0.42		0.52	0.18	0.67		0.77			
Uniform Delay, d1		5.6	0.0		5.4	0.0	38.4		39.2			
Progression Factor		0.91	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.4	0.6		0.5	0.1	2.3		6.4			
Delay (s)		5.4	0.6		5.9	0.1	40.8		45.7			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		4.3			4.7			43.2			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
Baseline + Project PM

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 736*** 490 398
Lanes: 1 0 2 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
528	2		Vol Cnt Date:	n/a		1	177
			Cycle Time (sec):	100			
	0		Loss Time (sec):	16		0	
1973***	3		Critical V/C:	1.072		3	1320
	0		Avg Crit Del (sec/veh):	196.7		0	
583	1		Avg Delay (sec/veh):	141.7		2	171***
			LOS:	F			

Lanes: 2 0 2 0 1
Initial Vol: 503*** 274 158
Signal=Protect/Rights=Overlap

Approach:	North Bound L	North Bound T	North Bound R	South Bound L	South Bound T	South Bound R	East Bound L	East Bound T	East Bound R	West Bound L	West Bound T	West Bound R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	503	274	158	398	490	736	528	1973	583	171	1320	177
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	503	274	158	398	490	736	528	1973	583	171	1320	177
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	503	274	158	398	490	736	528	1973	583	171	1320	177
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	503	274	158	398	490	736	528	1973	583	171	1320	177
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	503	274	158	398	490	736	528	1973	583	171	1320	177
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	553	274	158	438	490	736	581	1973	583	188	1320	177
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.20	0.10	0.11	0.16	0.18	0.54	0.21	0.48	0.42	0.07	0.32	0.13
Crit Vol:	277					736		658		94		
Crit Moves:	****					****		****		****		

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 PM

Intersection #1: Valley Hi & Mack

Signal=Protect/Rights=Include
Initial Vol: 128 253 495***
Lanes: 0 1 1 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Initial Vol:
119	1		Vol Cnt Date:	n/a		0	316
			Cycle Time (sec):	100			
	0		Loss Time (sec):	16		1	
1140***	2		Critical V/C:	0.846		1	920
	0		Avg Crit Del (sec/veh):	44.1		0	
200	1		Avg Delay (sec/veh):	37.0		2	520***
			LOS:	D			

Lanes: 2 0 1 1 1
Initial Vol: 310 168*** 500
Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	10	0	4	6	0	4	26	0	4	38	0
Volume Module:												
Base Vol:	310	168	500	495	253	128	119	1140	200	520	920	316
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	310	168	500	495	253	128	119	1140	200	520	920	316
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	310	168	500	495	253	128	119	1140	200	520	920	316
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	310	168	500	495	253	128	119	1140	200	520	920	316
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	310	168	500	495	253	128	119	1140	200	520	920	316
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	310	168	500	495	253	128	119	1140	200	520	920	316
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.84	0.84	0.92	0.90	0.90	0.95	0.95	0.85	0.92	0.91	0.91
Lanes:	2.00	1.00	2.00	2.00	1.33	0.67	1.00	2.00	1.00	2.00	1.49	0.51
Final Sat.:	3502	1603	3206	3502	2277	1152	1805	3610	1615	3502	2585	888
Capacity Analysis Module:												
Vol/Sat:	0.09	0.10	0.16	0.14	0.11	0.11	0.07	0.32	0.12	0.15	0.36	0.36
Crit Moves:		****		****				****		****		
Green/Cycle:	0.13	0.12	0.30	0.17	0.16	0.16	0.08	0.37	0.37	0.18	0.47	0.47
Volume/Cap:	0.69	0.85	0.52	0.85	0.69	0.69	0.81	0.85	0.33	0.85	0.76	0.76
Delay/Veh:	46.0	51.3	29.5	51.4	43.1	43.1	73.2	33.8	22.7	50.4	24.1	24.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.0	51.3	29.5	51.4	43.1	43.1	73.2	33.8	22.7	50.4	24.1	24.1
HCM2kAvg:	6	8	7	10	7	7	6	19	4	11	17	17
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		2 0 1 1 1			2 0 1 1 0			1 0 2 0 1			2 0 1 1 0	
Lane Group:	L	RT	RT	L	RT	RT	L	T	R	L	RT	RT
#LnsInGrps:	2	3	3	2	2	2	1	2	1	2	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	xxxx	0.89	0.89	xxxx	0.95	0.95	xxxx	xxxx	0.85	xxxx	0.96	0.96
LT Adj:	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	0.89	0.89	0.95	0.95	0.95	0.95	1.00	0.85	0.95	0.96	0.96
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	0.95
Fnl Sat Adj:	0.92	0.84	0.84	0.92	0.90	0.90	0.95	0.95	0.85	0.92	0.91	0.91
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.13	0.12	0.30	0.17	0.16	0.16	0.08	0.37	0.37	0.18	0.47	0.47
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.3	4.6	5.8	7.0	5.0	5.0	3.4	14.5	4.0	7.4	14.2	14.2
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	1.8	3.1	1.0	3.5	1.9	1.9	2.5	4.2	0.5	3.5	2.8	2.8
HCM2KQueue:	6.2	7.6	6.8	10.5	6.9	6.9	6.0	18.7	4.5	10.9	17.0	17.0
70th%Factor:	1.19	1.18	1.18	1.18	1.18	1.18	1.19	1.16	1.19	1.18	1.17	1.17
70th%HCM2kQ:	7.3	9.0	8.1	12.3	8.1	8.1	7.1	21.7	5.3	12.8	19.8	19.8
85th%Factor:	1.54	1.53	1.54	1.51	1.54	1.54	1.55	1.46	1.56	1.51	1.47	1.47
85th%HCM2kQ:	9.5	11.7	10.5	15.8	10.5	10.5	9.2	27.3	7.0	16.4	25.0	25.0
90th%Factor:	1.69	1.67	1.68	1.64	1.68	1.68	1.70	1.56	1.72	1.63	1.57	1.57
90th%HCM2kQ:	10.4	12.7	11.5	17.2	11.5	11.5	10.1	29.1	7.7	17.7	26.8	26.8
95th%Factor:	1.93	1.89	1.91	1.84	1.91	1.91	1.93	1.71	1.97	1.83	1.73	1.73
95th%HCM2kQ:	11.9	14.4	13.0	19.2	13.1	13.1	11.5	32.0	8.8	19.9	29.5	29.5
98th%Factor:	2.32	2.26	2.29	2.15	2.29	2.29	2.33	1.94	2.41	2.13	1.97	1.97
98th%HCM2kQ:	14.3	17.2	15.6	22.5	15.7	15.7	13.9	36.2	10.8	23.2	33.5	33.5

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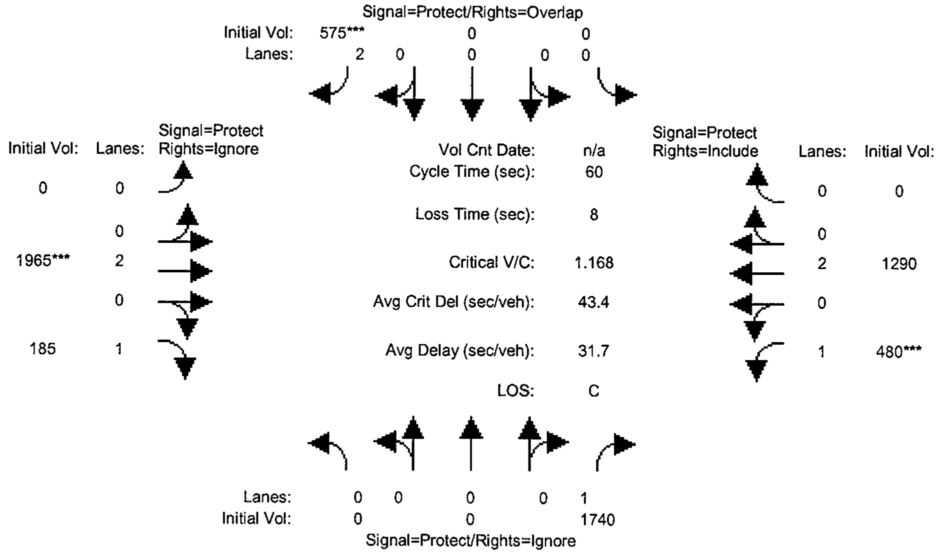
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 PM

Intersection #2: Alta Valley & Mack



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	1740	0	0	575	0	1965	185	480	1290	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	1740	0	0	575	0	1965	185	480	1290	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	1740	0	0	575	0	1965	185	480	1290	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	575	0	1965	0	480	1290	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	575	0	1965	0	480	1290	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	575	0	1965	0	480	1290	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.54	0.00	0.27	0.36	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	1.19	0.00	0.72	0.00	1.11	0.51	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	129.5	0.0	4.7	0.0	98.7	4.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	129.5	0.0	4.7	0.0	98.7	4.4	0.0
HCM2kAvg:	0	0	0	0	0	14	0	11	0	20	6	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 1			0 0 0 0 2			0 0 2 0 1			1 0 2 0 0		
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	4.8	0.0	8.6	0.0	8.4	5.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	9.5	0.0	2.4	0.0	11.6	1.0	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	14.3	0.0	11.0	0.0	20.0	6.0	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.17	1.20	1.18	1.20	1.16	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	16.7	0.0	13.0	0.0	23.2	7.2	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.49	1.60	1.51	1.60	1.45	1.55	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	21.3	0.0	16.6	0.0	29.1	9.3	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.60	1.80	1.63	1.80	1.55	1.70	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	22.8	0.0	18.0	0.0	31.0	10.3	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.77	2.10	1.83	2.10	1.70	1.93	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	25.3	0.0	20.1	0.0	34.0	11.7	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.03	2.70	2.13	2.70	1.91	2.33	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	29.1	0.0	23.5	0.0	38.3	14.1	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 PM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Include

	L		T		R
Initial Vol:	80		723***		180
Lanes:	1	0	2	0	1

Initial Vol:	Lanes:	Signal=Split Rights=Include
60	1	
	0	
30***	1!	
	0	
15	0	

Vol Cnt Date:	n/a
Cycle Time (sec):	90
Loss Time (sec):	16
Critical V/C:	0.500
Avg Crit Del (sec/veh):	25.0
Avg Delay (sec/veh):	26.3
LOS:	C

Signal=Split Rights=Include	Lanes:	Initial Vol:
	2	450***
	0	
	0	80
	1	
	1	250

Lanes:	1	0	2	0	1
Initial Vol:	20***		478		90

Signal=Protect/Rights=Include

```
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4    4     0     6    6     0     0    4     0     0    4     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     20  478    90   180  723    80    60   30    15   250   80   450
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  20  478    90   180  723    80    60   30    15   250   80   450
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  20  478    90   180  723    80    60   30    15   250   80   450
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   20  478    90   180  723    80    60   30    15   250   80   450
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  20  478    90   180  723    80    60   30    15   250   80   450
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   20  478    90   180  723    80    60   30    15   250   80   450
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.95 0.95  0.85  0.95 0.95  0.85  0.95 0.95  0.95  0.96 0.96  0.75
Lanes:      1.00 2.00  1.00  1.00 2.00  1.00  1.40 0.40  0.20  1.52 0.48  2.00
Final Sat.: 1805 3610  1615  1805 3610  1615  2531  723   362  2772  887  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.01 0.13  0.06  0.10 0.20  0.05  0.02 0.04  0.04  0.09 0.09  0.16
Crit Moves: ****                  ****              ****                    ****
Green/Cycle: 0.04 0.25  0.25  0.19 0.39  0.39  0.08 0.08  0.08  0.31 0.31  0.31
Volume/Cap: 0.25 0.54  0.23  0.54 0.51  0.13  0.29 0.51  0.51  0.29 0.29  0.51
Delay/Veh:  43.2 30.0  27.3  34.8 21.3  17.7  39.4 41.9  41.9  23.8 23.8  26.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 43.2 30.0  27.3  34.8 21.3  17.7  39.4 41.9  41.9  23.8 23.8  26.1
HCM2kAvg:      1    6     2     5    8     1     1    3     3     4    4     6
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        1  0  2  0  1    1  0  2  0  1    1  0  1! 0  0    1  1  0  0  2
Lane Group:   L    T     R     L    T     R    LTR  LTR   LTR    LT   LT     R
#LnsInGrps:    1    2     1     1    2     1     2    1     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx     1 xxxx  xxxx     4    4     4     4    4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Area Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:     xxxx xxxx  0.85  xxxx xxxx  0.85  0.98 0.98  0.98  xxxx xxxx  0.85
LT Adj:     0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.97 0.97  0.97  0.96 0.96 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95 1.00  0.85  0.95 0.95  0.95  0.96 0.96  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  1.00  1.00 1.00  1.00  1.00 1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95 0.95  0.85  0.95 0.95  0.95  0.96 0.96  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < No    > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < <     Actuated      > > > > > > > > > > > > >
DelAdjFctr: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                       2000 HCM Operations Method
                        Future Volume Alternative
```

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Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.04	0.25	0.25	0.19	0.39	0.39	0.08	0.08	0.08	0.31	0.31	0.31
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.5	5.2	1.8	4.3	6.9	1.3	1.0	1.9	1.9	3.3	3.3	4.6
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.3	1.1	0.3	1.1	1.0	0.1	0.4	1.0	1.0	0.4	0.4	1.0
HCM2KQueue:	0.8	6.3	2.1	5.4	7.9	1.4	1.4	2.8	2.8	3.7	3.7	5.6
70th%Factor:	1.20	1.19	1.19	1.19	1.18	1.20	1.20	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	1.0	7.5	2.5	6.4	9.4	1.7	1.7	3.4	3.4	4.4	4.4	6.7
85th%Factor:	1.59	1.54	1.58	1.55	1.53	1.59	1.59	1.57	1.57	1.57	1.57	1.55
85th%HCM2kQ:	1.3	9.7	3.3	8.3	12.1	2.3	2.3	4.4	4.4	5.7	5.7	8.7
90th%Factor:	1.78	1.69	1.76	1.71	1.67	1.77	1.77	1.75	1.75	1.73	1.73	1.70
90th%HCM2kQ:	1.5	10.6	3.7	9.2	13.2	2.5	2.6	4.9	4.9	6.4	6.4	9.6
95th%Factor:	2.07	1.92	2.03	1.95	1.89	2.05	2.05	2.01	2.01	1.99	1.99	1.94
95th%HCM2kQ:	1.7	12.1	4.2	10.5	15.0	2.9	3.0	5.7	5.7	7.3	7.3	10.9
98th%Factor:	2.64	2.32	2.55	2.36	2.24	2.60	2.60	2.51	2.51	2.45	2.45	2.35
98th%HCM2kQ:	2.2	14.6	5.3	12.7	17.8	3.7	3.7	7.0	7.0	9.0	9.0	13.3

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 PM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 823 150
Lanes: 0 0 2 0 1

Signal=Stop
Rights=Include

Initial Vol: Lanes:
0 0
0
0 0
0
0 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 3.8
Avg Delay (sec/veh): 3.8
LOS: C

Signal=Stop
Rights=Include

Lanes: Initial Vol:
1 140
0
0 0
0
1 80

Lanes: 0 0 1 1 0
Initial Vol: 0 443 50
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  443    50   150  823     0     0    0     0    80    0   140
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  443    50   150  823     0     0    0     0    80    0   140
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0  443    50   150  823     0     0    0     0    80    0   140
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  443    50   150  823     0     0    0     0    80    0   140
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    0  443    50   150  823     0     0    0     0    80    0   140
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   493 xxxx xxxxx  xxxx xxxx xxxxx  1180 xxxx   247
Potent Cap.: xxxx xxxx xxxxx  1081 xxxx xxxxx  xxxx xxxx xxxxx   186 xxxx   760
Move Cap.:   xxxx xxxx xxxxx  1081 xxxx xxxxx  xxxx xxxx xxxxx   166 xxxx   760
Volume/Cap:  xxxx xxxx  xxxx  0.14 xxxx  xxxx  xxxx xxxx  xxxx  0.48 xxxx  0.18
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.5 xxxx xxxxx xxxxx xxxx xxxxx   2.3 xxxx   0.7
Stopped Del:xxxxx xxxx xxxxx   8.9 xxxx xxxxx xxxxx xxxx xxxxx  45.2 xxxx  10.8
LOS by Move:    *    *     *     A    *     *     *    *     *     E    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            23.3
ApproachLOS:        *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                    #5
Dist(miles):                   0.000
Speed (mph):                    0.00
SignalIndex:                   #3
Cycle Time:                          0 secs
InitVolume:                 0      0
Saturation:                 0      0
ArrivalType:                0      0
G/C:                     0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                      0.000 0.000
gq1:                     0.00  0.00
gq2:                     0.00  0.00
gq:                      0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                         0.000
beta:                          0.000
ta (secs):                     0.000
F:                             0.000
f:                      0.000 0.000
vcmax:                      0      0
vcg:                        0      0
vcmin:                      0      0
tp:                       0.0    0.0
p:                             0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:       0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0 xxxxx xxxxx  493 xxxxx xxxxx    0     0     0 1180     0   247
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:   0 xxxxx xxxxx  493 xxxxx xxxxx    0     0     0 1180     0   247
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx 1081 xxxxx xxxxx  900   900   900  186   900   760
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:   900 xxxxx xxxxx 1081 xxxxx xxxxx  900   900   900  186   900   760
                       Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:         0  0  1  1  0     1  0  2  0  0     0  0  0  0  0     1  0  0  0  1
Final Vol.:      0  443    50    150  823     0      0    0     0     80    0   140
ApproachDel:      xxxxxx            xxxxxx            xxxxxx             23.3
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.4]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=220]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1686]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Valley Hi & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:         0  0  1  1  0     1  0  2  0  0     0  0  0  0  0     1  0  0  0  1
Final Vol.:      0  443    50    150  823     0      0    0     0     80    0   140
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1466
Minor Approach Volume:            220
Minor Approach Volume Threshold: 210
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 PM

Intersection #5: Alta Valley & Bruceville

North side (Southbound): Signal=Split/Rights=Include
Initial Vol: 160 65 350***
Lanes: 0 1 0 1 1

West side (Eastbound): Signal=Split Rights=Include

Initial Vol:	Lanes:
65	1
	0
200***	1
	1
35	0

Vol Cnt Date:	n/a
Cycle Time (sec):	80
Loss Time (sec):	16
Critical V/C:	0.719
Avg Crit Del (sec/veh):	31.0
Avg Delay (sec/veh):	30.9
LOS:	C

East side (Westbound): Signal=Split Rights=Include

Lanes:	Initial Vol:
0	380
1	
1	540***
0	
1	40

South side (Northbound):
Lanes: 0 1 0 1 0
Initial Vol: 80*** 210 130
Signal=Split/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	80	210	130	350	65	160	65	200	35	40	540	380
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	80	210	130	350	65	160	65	200	35	40	540	380
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	80	210	130	350	65	160	65	200	35	40	540	380
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	80	210	130	350	65	160	65	200	35	40	540	380
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	210	130	350	65	160	65	200	35	40	540	380
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	80	210	130	350	65	160	65	200	35	40	540	380
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.90	0.88	0.88	0.88	0.95	0.93	0.93	0.95	0.89	0.89
Lanes:	0.38	1.00	0.62	1.83	0.34	0.83	1.00	1.70	0.30	1.00	1.17	0.83
Final Sat.:	650	1706	1056	3063	569	1400	1805	3005	526	1805	1988	1399
Capacity Analysis Module:												
Vol/Sat:	0.12	0.12	0.12	0.11	0.11	0.11	0.04	0.07	0.07	0.02	0.27	0.27
Crit Moves:	****			****				****			****	
Green/Cycle:	0.17	0.17	0.17	0.16	0.16	0.16	0.09	0.09	0.09	0.38	0.38	0.38
Volume/Cap:	0.72	0.72	0.72	0.72	0.72	0.72	0.39	0.72	0.72	0.06	0.72	0.72
Delay/Veh:	35.7	35.7	35.7	35.2	35.2	35.2	35.7	42.9	42.9	15.9	23.3	23.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.7	35.7	35.7	35.2	35.2	35.2	35.7	42.9	42.9	15.9	23.3	23.3
HCM2kAvg:	7	7	7	6	6	6	2	4	4	1	11	11
HCM Ops Adjusted Lane Utilization Module:												
Lanes:		0 1 0 1 0			1 1 0 1 0			1 0 1 1 0			1 0 1 1 0	
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.95	0.95	0.95	0.96	0.96	0.96	xxxx	0.98	0.98	xxxx	0.94	0.94
LT Adj:	0.99	0.99	0.99	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.98	0.98	0.95	0.94	0.94
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.90	0.90	0.90	0.88	0.88	0.88	0.95	0.93	0.93	0.95	0.89	0.89
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.17	0.17	0.17	0.16	0.16	0.16	0.09	0.09	0.09	0.38	0.38	0.38
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	4.5	4.5	4.5	4.2	4.2	4.2	1.4	2.5	2.5	0.6	8.7	8.7
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	2.1	2.1	2.1	2.1	2.1	2.1	0.6	1.9	1.9	0.1	2.3	2.3
HCM2KQueue:	6.6	6.6	6.6	6.3	6.3	6.3	2.0	4.5	4.5	0.7	11.1	11.1
70th%Factor:	1.18	1.18	1.18	1.19	1.19	1.19	1.20	1.19	1.19	1.20	1.18	1.18
70th%HCM2kQ:	7.8	7.8	7.8	7.4	7.4	7.4	2.4	5.3	5.3	0.8	13.0	13.0
85th%Factor:	1.54	1.54	1.54	1.54	1.54	1.54	1.58	1.56	1.56	1.59	1.51	1.51
85th%HCM2kQ:	10.1	10.1	10.1	9.7	9.7	9.7	3.2	6.9	6.9	1.0	16.7	16.7
90th%Factor:	1.69	1.69	1.69	1.69	1.69	1.69	1.76	1.72	1.72	1.79	1.63	1.63
90th%HCM2kQ:	11.1	11.1	11.1	10.6	10.6	10.6	3.6	7.7	7.7	1.2	18.0	18.0
95th%Factor:	1.92	1.92	1.92	1.92	1.92	1.92	2.04	1.97	1.97	2.08	1.82	1.82
95th%HCM2kQ:	12.6	12.6	12.6	12.1	12.1	12.1	4.2	8.8	8.8	1.4	20.2	20.2
98th%Factor:	2.30	2.30	2.30	2.32	2.32	2.32	2.55	2.41	2.41	2.65	2.13	2.13
98th%HCM2kQ:	15.1	15.1	15.1	14.5	14.5	14.5	5.2	10.7	10.7	1.7	23.5	23.5

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 PM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Split/Rights=Overlap
Initial Vol: 240 0 240***
Lanes: 1 0 0 0 1

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
			Vol Cnt Date:	n/a			
			Cycle Time (sec):	90			
330***	1					0	80
	0		Loss Time (sec):	14		1	
350	2		Critical V/C:	0.640		1	720***
	0		Avg Crit Del (sec/veh):	28.7		0	
0	0		Avg Delay (sec/veh):	22.4		0	0
			LOS:	C			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Split/Rights=Include

```
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    0     0     0    4     0     0    4     6     0    0     6     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0  240     0   240  330   350     0    0   720    80
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0  240     0   240  330   350     0    0   720    80
Added Vol:     0     0     0    0     0     0    0     0     0    0     0     0
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0  240     0   240  330   350     0    0   720    80
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Volume:    0     0     0  240     0   240  330   350     0    0   720    80
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0  240     0   240  330   350     0    0   720    80
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Final Vol.:    0     0     0  240     0   240  330   350     0    0   720    80
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900  1900
Adjustment:  1.00  1.00  1.00 0.95  1.00  0.85 0.95  0.95  1.00 1.00  0.94  0.94
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 1.00  2.00  0.00 0.00  1.80  0.20
Final Sat.:    0     0     0 1805     0  1615 1805  3610     0    0  3200   356
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.13  0.00  0.15 0.18  0.10  0.00 0.00  0.22  0.22
Crit Moves:                   ****             ****                   ****
Green/Cycle: 0.00  0.00  0.00 0.21  0.00  0.49 0.29  0.64  0.00 0.00  0.35  0.56
Volume/Cap:  0.00  0.00  0.00 0.64  0.00  0.30 0.64  0.15  0.00 0.00  0.64  0.40
Delay/Veh:    0.0   0.0   0.0 36.3   0.0  13.8 30.8   6.6   0.0  0.0  25.6  11.4
User DelAdj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
AdjDel/Veh:   0.0   0.0   0.0 36.3   0.0  13.8 30.8   6.6   0.0  0.0  25.6  11.4
HCM2kAvg:      0     0     0    7     0     4    9     2     0    0    10     6
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
Lane Group:  xxxx  xxxx  xxxx   L   xxxx    R    L     T   xxxx xxxx   RT    RT
#LnsInGrps:    0     0     0    1     0     1    1     2     0    0     2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12    12    12   12    12    12   12    12    12   12    12    12
CrosswalkWid        8                 8                 8                 8
% Hev Veh:          0                 0                 0                 0
Grade:              0%                0%                0%                0%
Parking/Hr:         No                No                No                No
Bus Stp/Hr:         0                 0                 0                 0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > >
Cnft Ped/Hr:        0                 0                 0                 0
ExclusiveRT:     Include           Include           Include           Include
% RT Prtct:         0                 0                 0                 0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:  xxxx  xxxx  xxxx    1  xxxx  xxxx    1  xxxx  xxxx xxxx  xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  xxxx  xxxx xxxxx 1.00  xxxx  1.00 1.00  1.00 xxxxx xxxx  1.00  1.00
Hev Veh Adj: xxxx  xxxx xxxxx 1.00  xxxx  1.00 1.00  1.00 xxxxx xxxx  1.00  1.00
Grade Adj:   xxxx  xxxx xxxxx 1.00  xxxx  1.00 1.00  1.00 xxxxx xxxx  1.00  1.00
Parking Adj: xxxx  xxxx xxxxx xxxx  xxxx  1.00 xxxx  1.00 xxxxx xxxx  1.00  1.00
Bus Stp Adj: xxxx  xxxx xxxxx xxxx  xxxx  1.00 xxxx  1.00 xxxxx xxxx  1.00  1.00
Area Adj:    xxxx  xxxx xxxxx 1.00  xxxx  1.00 1.00  1.00 xxxxx xxxx  1.00  1.00
RT Adj:      xxxx  xxxx xxxxx xxxx  xxxx  0.85 xxxx  xxxx xxxxx xxxx  0.99  0.99
LT Adj:      xxxx  xxxx xxxxx 0.95  xxxx xxxxx 0.95  xxxx xxxxx xxxx  xxxx xxxxx
PedBike Adj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
HCM Sat Adj: 1.00  1.00  1.00 0.95  1.00  0.85 0.95  1.00  1.00 1.00  0.99  0.99
Usr Sat Adj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Sat Adj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.95  1.00 1.00  0.95  0.95
Fnl Sat Adj: 1.00  1.00  1.00 0.95  1.00  0.85 0.95  0.95  1.00 1.00  0.94  0.94
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < No    > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr:  0.00  0.00  0.00 1.00  0.00  1.00 1.00  1.00  0.00 0.00  1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                       2000 HCM Operations Method
                        Future Volume Alternative
```


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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.21	0.00	0.49	0.29	0.64	0.00	0.00	0.35	0.56
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	5.8	0.0	3.6	7.6	1.8	0.0	0.0	8.4	5.7
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	1.6	0.0	0.4	1.7	0.2	0.0	0.0	1.7	0.7
HCM2KQueue:	0.0	0.0	0.0	7.4	0.0	4.0	9.3	1.9	0.0	0.0	10.1	6.4
70th%Factor:	1.20	1.20	1.20	1.18	1.20	1.19	1.18	1.20	1.20	1.20	1.18	1.19
70th%HCM2kQ:	0.0	0.0	0.0	8.8	0.0	4.8	10.9	2.3	0.0	0.0	11.8	7.5
85th%Factor:	1.60	1.60	1.60	1.53	1.60	1.56	1.52	1.58	1.60	1.60	1.51	1.54
85th%HCM2kQ:	0.0	0.0	0.0	11.4	0.0	6.3	14.1	3.1	0.0	0.0	15.2	9.8
90th%Factor:	1.80	1.80	1.80	1.68	1.80	1.73	1.65	1.76	1.80	1.80	1.64	1.69
90th%HCM2kQ:	0.0	0.0	0.0	12.4	0.0	6.9	15.3	3.4	0.0	0.0	16.5	10.8
95th%Factor:	2.10	2.10	2.10	1.90	2.10	1.98	1.86	2.04	2.10	2.10	1.84	1.92
95th%HCM2kQ:	0.0	0.0	0.0	14.0	0.0	7.9	17.2	4.0	0.0	0.0	18.5	12.2
98th%Factor:	2.70	2.70	2.70	2.27	2.70	2.44	2.19	2.56	2.70	2.70	2.16	2.31
98th%HCM2kQ:	0.0	0.0	0.0	16.8	0.0	9.7	20.3	5.0	0.0	0.0	21.7	14.7

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 PM

Intersection #7: Bruceville / Kaiser Access

Signal=Uncontrol/Rights=Include
Initial Vol: 100 490 0
Lanes: 0 1 1 0 0

Signal=Stop
Rights=Include

Initial Vol:	Lanes:
120	0
	0
0	1!
	0
180	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	22.6
Avg Delay (sec/veh):	22.6
LOS:	F

Signal=Stop
Rights=Include

Lanes:	Initial Vol:
0	0
0	
0	0
0	
0	0

Lanes: 1 0 1 0 0
Initial Vol: 100 680 0
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     100  680    0     0  490  100   120    0  180     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  100  680    0     0  490  100   120    0  180     0    0    0
Added Vol:      0    0    0     0    0    0     0    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:  100  680    0     0  490  100   120    0  180     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   100  680    0     0  490  100   120    0  180     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:   100  680    0     0  490  100   120    0  180     0    0    0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  590 xxxx xxxxx  xxxx xxxx xxxxx  1420 xxxx   295  xxxx xxxx xxxxx
Potent Cap.:  995 xxxx xxxxx  xxxx xxxx xxxxx   152 xxxx   749  xxxx xxxx xxxxx
Move Cap.:    995 xxxx xxxxx  xxxx xxxx xxxxx   140 xxxx   749  xxxx xxxx xxxxx
Volume/Cap:  0.10 xxxx  xxxx  xxxx xxxx  xxxx  0.86 xxxx  0.24  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  9.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  274 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.4 xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  123 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    F     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            123.1            xxxxxx
ApproachLOS:        *                *                F                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:            0%               0%               0%               0%
Grade:             0%               0%               0%               0%
Peds/Hour:         0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:       #120
Dist(miles):      0.000
Speed (mph):       0.00
SignalIndex:      #8
Cycle Time:          0 secs
InitVolume:     0      0
Saturation:     0      0
ArrivalType:    0      0
G/C:         0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:          0.000  0.000
gq1:         0.00   0.00
gq2:         0.00   0.00
gq:          0.00   0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:            0.000
beta:             0.000
ta (secs):        0.000
F:                0.000
f:          0.000 0.000
vcmax:          0      0
vcg:            0      0
vcmin:          0      0
tp:           0.0    0.0
p:                0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 590 xxxxx xxxxx    0 xxxxx xxxxx 1420     0   295    0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 590 xxxxx xxxxx    0 xxxxx xxxxx 1420     0   295    0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  995 xxxxx xxxxx  900 xxxxx xxxxx  152   900   749  900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:   995 xxxxx xxxxx  900 xxxxx xxxxx  152   900   749  900   900   900
                        Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:         1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   100  680    0      0  490  100   120    0  180      0    0    0
ApproachDel:     xxxxxx           xxxxxx            123.1            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=10.3]
   SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=300]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1670]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                   Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #7 Bruceville / Kaiser Access
********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:         1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   100  680    0      0  490  100   120    0  180      0    0    0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            1370
Minor Approach Volume:           300
Minor Approach Volume Threshold: 176
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 PM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 140 530*** 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Include	Lanes:	Initial Vol:
120***	1		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	104			
	0		Loss Time (sec):	12		0	
0	0		Critical V/C:	0.373		0	0
	0		Avg Crit Del (sec/veh):	21.4		0	
170	1		Avg Delay (sec/veh):	16.2		0	0
			LOS:	B			

Lanes: 1 0 2 0 0
Initial Vol: 130*** 560 0
Signal=Protect/Rights=Include

```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    5    6     0     0    6     0     4    0     5     0    0     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    130  560     0     0  530   140   120    0   170     0    0     0
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 130  560     0     0  530   140   120    0   170     0    0     0
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut: 130  560     0     0  530   140   120    0   170     0    0     0
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  130  560     0     0  530   140   120    0   170     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 130  560     0     0  530   140   120    0   170     0    0     0
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  130  560     0     0  530   140   120    0   170     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.95 0.95  1.00  1.00 0.92  0.92  0.95 1.00  0.85  1.00 1.00  1.00
Lanes:      1.00 2.00  0.00  0.00 1.58  0.42  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.: 1805 3610     0     0 2767   731  1805    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.07 0.16  0.00  0.00 0.19  0.19  0.07 0.00  0.11  0.00 0.00  0.00
Crit Moves: ****                  ****        ****
Green/Cycle: 0.19 0.71  0.00  0.00 0.51  0.51  0.18 0.00  0.37  0.00 0.00  0.00
Volume/Cap: 0.37 0.22  0.00  0.00 0.37  0.37  0.37 0.00  0.28  0.00 0.00  0.00
Delay/Veh:  37.2  5.3   0.0   0.0 15.4  15.4  38.4  0.0  23.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 37.2  5.3   0.0   0.0 15.4  15.4  38.4  0.0  23.2   0.0  0.0   0.0
HCM2kAvg:      4    3     0     0    6     6     4    0     4     0    0     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        1  0  2  0  0   0  0  1  1  0   1  0  0  0  1   0  0  0  0  0
Lane Group:    L    T  xxxx  xxxx RT    RT     L xxxx     R  xxxx xxxx  xxxx
#LnsInGrps:    1    2     0     0    2     2     1    0     1     0    0     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx  xxxx xxxx  xxxx     1 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Hev Veh Adj: 1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Grade Adj:   1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Parking Adj: xxxx 1.00 xxxxx  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx xxxx xxxxx
Bus Stp Adj: xxxx 1.00 xxxxx  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx xxxx xxxxx
Area Adj:    1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
RT Adj:      xxxx xxxx xxxxx  xxxx 0.97  0.97  xxxx xxxx  0.85  xxxx xxxx xxxxx
LT Adj:      0.95 xxxx xxxxx  xxxx xxxx xxxxx  0.95 xxxx xxxxx  xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  1.00  1.00 0.97  0.97  0.95 1.00  0.85  1.00 1.00  1.00
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  0.95  1.00 1.00  1.00  1.00 1.00  1.00
Fnl Sat Adj: 0.95 0.95  1.00  1.00 0.92  0.92  0.95 1.00  0.85  1.00 1.00  1.00
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > > >
DelAdjFctr: 1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
       Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                         2000 HCM Operations Method
                          Future Volume Alternative
```

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.19	0.71	0.00	0.00	0.51	0.51	0.18	0.00	0.37	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	3.4	2.8	0.0	0.0	5.8	5.8	3.2	0.0	3.5	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.6	0.3	0.0	0.0	0.6	0.6	0.6	0.0	0.4	0.0	0.0	0.0
HCM2KQueue:	4.0	3.1	0.0	0.0	6.4	6.4	3.8	0.0	3.8	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	4.8	3.7	0.0	0.0	7.6	7.6	4.5	0.0	4.6	0.0	0.0	0.0
85th%Factor:	1.56	1.57	1.60	1.60	1.54	1.54	1.56	1.60	1.56	1.60	1.60	1.60
85th%HCM2kQ:	6.3	4.9	0.0	0.0	9.9	9.9	5.9	0.0	6.0	0.0	0.0	0.0
90th%Factor:	1.73	1.74	1.80	1.80	1.69	1.69	1.73	1.80	1.73	1.80	1.80	1.80
90th%HCM2kQ:	6.9	5.4	0.0	0.0	10.8	10.8	6.6	0.0	6.7	0.0	0.0	0.0
95th%Factor:	1.98	2.01	2.10	2.10	1.92	1.92	1.99	2.10	1.98	2.10	2.10	2.10
95th%HCM2kQ:	8.0	6.2	0.0	0.0	12.3	12.3	7.5	0.0	7.6	0.0	0.0	0.0
98th%Factor:	2.43	2.49	2.70	2.70	2.31	2.31	2.45	2.70	2.44	2.70	2.70	2.70
98th%HCM2kQ:	9.8	7.7	0.0	0.0	14.8	14.8	9.3	0.0	9.4	0.0	0.0	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 PM

Intersection #9: Arroyo Vista & Wyndham

Signal=Stop/Rights=Include

Initial Vol:	0		0		0
Lanes:	0	0	0	0	0

West approach: Signal=Uncontrol, Rights=Include

Initial Vol:	Lanes:
0	0
	0
270	0
	1
40	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	1.3
Avg Delay (sec/veh):	1.3
LOS:	B

East approach: Signal=Uncontrol, Rights=Include

Lanes:	Initial Vol:
0	0
0	
1	240
0	
1	30

Lanes:	0	0	1!	0	0
Initial Vol:	30		0		20

Signal=Stop/Rights=Include

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      30    0    20     0    0     0     0  270    40    30  240     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   30    0    20     0    0     0     0  270    40    30  240     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   30    0    20     0    0     0     0  270    40    30  240     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    30    0    20     0    0     0     0  270    40    30  240     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    30    0    20     0    0     0     0  270    40    30  240     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  590 xxxx   290  xxxx xxxx xxxxx  xxxx xxxx xxxxx   310 xxxx xxxxx
Potent Cap.:  474 xxxx   754  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1262 xxxx xxxxx
Move Cap.:    465 xxxx   754  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1262 xxxx xxxxx
Volume/Cap:  0.06 xxxx  0.03  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  549 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx 12.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     *    *     *
ApproachDel:       12.2           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B               *                *                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                          #26
Dist(miles):                                                         0.000
Speed (mph):                                                          0.00
SignalIndex:                                                         #8
Cycle Time:                                                              0 secs
InitVolume:                                                        0     0
Saturation:                                                        0     0
ArrivalType:                                                       0     0
G/C:                                                            0.00  0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                             0.000 0.000
gq1:                                                            0.00  0.00
gq2:                                                            0.00  0.00
gq:                                                             0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                               0.000
beta:                                                                0.000
ta (secs):                                                           0.000
F:                                                                   0.000
f:                                                             0.000 0.000
vcmax:                                                             0     0
vcg:                                                               0     0
vcmin:                                                             0     0
tp:                                                              0.0   0.0
p:                                                                   0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 590     0   290     0     0     0     0 xxxxx xxxxx  310 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol: 590     0   290     0     0     0     0 xxxxx xxxxx  310 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  474   900   754  900   900   900  900 xxxxx xxxxx 1262 xxxxx xxxxx
UpstreamAdj:1.00 1.000 1.000 1.00 1.000 1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:   474   900   754  900   900   900  900 xxxxx xxxxx 1262 xxxxx xxxxx
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   1  0  1  0  0
Final Vol.:    30    0    20    0    0     0    0  270    40    30  240     0
ApproachDel:      12.2           xxxxxx           xxxxxx           xxxxxx
-----------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=50]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=630]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   1  0  1  0  0
Final Vol.:    30    0    20    0    0     0    0  270    40    30  240     0
-----------|---------------||---------------||---------------||---------------|
Major Street Volume:            580
Minor Approach Volume:          50
Minor Approach Volume Threshold: 473
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 PM

Intersection #10: Kaiser & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 80 0 90
Lanes: 0 0 1! 0 0

Signal=Uncontrol
Rights=Include

Initial Vol:	Lanes:
20	1
	0
220	1
	0
0	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	3.5
Avg Delay (sec/veh):	3.5
LOS:	B

Signal=Uncontrol
Rights=Include

Lanes:	Initial Vol:
0	50
1	
0	220
0	
0	0

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Stop/Rights=Include

```
Approach:     North Bound     South Bound      East Bound      West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0    90     0    80    20   220     0     0   220    50
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0     0     0    90     0    80    20   220     0     0   220    50
Added Vol:      0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    0     0     0    90     0    80    20   220     0     0   220    50
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:     0     0     0    90     0    80    20   220     0     0   220    50
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:     0     0     0    90     0    80    20   220     0     0   220    50
Critical Gap Module:
Critical Gp:xxxxx  xxxx xxxxx   6.4  xxxx   6.2   4.1  xxxx xxxxx xxxxx  xxxx xxxxx
FollowUpTim:xxxxx  xxxx xxxxx   3.5  xxxx   3.3   2.2  xxxx xxxxx xxxxx  xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  xxxx  xxxx xxxxx   505  xxxx   245   270  xxxx xxxxx  xxxx  xxxx xxxxx
Potent Cap.:  xxxx  xxxx xxxxx   530  xxxx   799  1305  xxxx xxxxx  xxxx  xxxx xxxxx
Move Cap.:    xxxx  xxxx xxxxx   524  xxxx   799  1305  xxxx xxxxx  xxxx  xxxx xxxxx
Volume/Cap:   xxxx  xxxx  xxxx  0.17  xxxx  0.10  0.02  xxxx  xxxx  xxxx  xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   0.0  xxxx xxxxx xxxxx  xxxx xxxxx
Stopped Del:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   7.8  xxxx xxxxx xxxxx  xxxx xxxxx
LOS by Move:    *     *     *     *     *     *     A     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  xxxx  xxxx xxxxx  xxxx   625 xxxxx  xxxx  xxxx xxxxx  xxxx  xxxx xxxxx
SharedQueue:xxxxx  xxxx xxxxx xxxxx   1.1 xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shrd StpDel:xxxxx  xxxx xxxxx xxxxx  12.9 xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shared LOS:     *     *     *     *     B     *     *     *     *     *     *     *
ApproachDel:     xxxxxx             12.9             xxxxxx            xxxxxx
ApproachLOS:        *                 B                 *                 *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%                0%                0%                0%
Grade:              0%                0%                0%                0%
Peds/Hour:          0                 0                 0                 0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet           12 feet           12 feet           12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                                                           #26
Dist(miles):                                                          0.000
Speed (mph):                                                           0.00
SignalIndex:                                                          #8
Cycle Time:                                                                0 secs
InitVolume:                                                         0      0
Saturation:                                                         0      0
ArrivalType:                                                        0      0
G/C:                                                             0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                                                              0.000  0.000
gq1:                                                             0.00   0.00
gq2:                                                             0.00   0.00
gq:                                                              0.00   0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                                                                0.000
beta:                                                                 0.000
ta (secs):                                                            0.000
F:                                                                    0.000
f:                                                              0.000  0.000
vcmax:                                                              0      0
vcg:                                                                0      0
vcmin:                                                              0      0
tp:                                                               0.0    0.0
p:                                                                    0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:                                      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0      0      0  505      0    245  270 xxxxx xxxxx    0 xxxxx xxxxx
UpstreamAdj:1.00  1.000  1.000 1.00  1.000  1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
ConflictVol:   0      0      0  505      0    245  270 xxxxx xxxxx    0 xxxxx xxxxx
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900    900    900  530    900    799 1305 xxxxx xxxxx  900 xxxxx xxxxx
UpstreamAdj:1.00  1.000  1.000 1.00  1.000  1.000 1.00 x.xxx x.xxx 1.00 x.xxx x.xxx
```

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```
PotentCap:   900   900   900  530   900   799 1305 xxxxx xxxxx  900 xxxxx xxxxx
                       Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0     0    90    0    80    20  220     0     0  220    50
ApproachDel:    xxxxxx             12.9             xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[southbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.6]
  FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=170]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=680]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #10 Kaiser & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
Final Vol.:     0    0     0    90    0    80    20  220     0     0  220    50
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            510
Minor Approach Volume:          170
Minor Approach Volume Threshold: 517
```


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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.94	0.91	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
Volume (vph)	160	980	750	2130	1400	330	420	420	1020	600	1060	70
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	980	750	2130	1400	330	420	420	1020	600	1060	70
RTOR Reduction (vph)	0	0	186	0	0	126	0	0	582	0	0	44
Lane Group Flow (vph)	160	980	564	2130	1400	204	420	420	438	600	1060	27
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	8.9	32.6	32.6	38.5	62.2	62.2	20.8	43.8	43.8	12.0	35.0	35.0
Effective Green, g (s)	8.4	33.3	33.3	38.0	62.9	62.9	19.8	44.5	44.5	11.0	35.7	35.7
Actuated g/C Ratio	0.06	0.23	0.23	0.27	0.44	0.44	0.14	0.31	0.31	0.08	0.25	0.25
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	202	1186	364	1328	2240	687	476	1103	856	264	885	390
v/s Ratio Prot	0.05	0.19		c0.43	0.28		c0.12	0.12		c0.17	c0.30	
v/s Ratio Perm			c0.36			0.13			0.16			0.02
v/c Ratio	0.79	0.83	1.55	1.60	0.62	0.30	0.88	0.38	0.51	2.27	1.20	0.07
Uniform Delay, d1	66.3	52.0	54.8	52.4	30.8	25.7	60.4	38.4	40.2	65.9	53.6	40.9
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	17.7	4.6	260.1	275.3	0.4	0.1	16.9	0.1	0.2	584.7	100.0	0.0
Delay (s)	84.0	56.6	314.8	327.7	31.2	25.8	77.2	38.5	40.5	650.6	153.5	40.9
Level of Service	F	E	F	F	C	C	E	D	D	F	F	D
Approach Delay (s)		161.4			194.4			48.3			321.3	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	182.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	142.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	126.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	2250	350	0	2740	900	0	0	0	1620	0	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2250	350	0	2740	900	0	0	0	1620	0	1210
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2250	350	0	2740	900	0	0	0	1620	0	1210
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		39.0	100.0		38.8	100.0				50.8		50.8
Effective Green, g (s)		40.0	100.0		40.0	100.0				52.0		52.0
Actuated g/C Ratio		0.40	1.00		0.40	1.00				0.52		0.52
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2034	1583		2034	2787				1785		823
v/s Ratio Prot		0.44			c0.54							
v/s Ratio Perm			0.22			0.32				0.47		c0.76
v/c Ratio		1.11	0.22		1.35	0.32				0.91		1.47
Uniform Delay, d1		30.0	0.0		30.0	0.0				21.8		24.0
Progression Factor		1.00	1.00		1.03	1.00				1.00		1.00
Incremental Delay, d2		55.7	0.3		157.9	0.2				7.0		218.2
Delay (s)		85.7	0.3		188.7	0.2				28.8		242.2
Level of Service		F	A		F	A				C		F
Approach Delay (s)		74.2			142.1			0.0			120.0	
Approach LOS		E			F			A			F	

Intersection Summary			
HCM Average Control Delay	115.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	134.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	3140	730	0	3190	720	450	0	540	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	3140	730	0	3190	720	450	0	540	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	3140	730	0	3190	720	450	0	538	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		67.6	100.0		67.9	100.0	21.8		21.8			
Effective Green, g (s)		68.9	100.0		68.9	100.0	23.1		23.1			
Actuated g/C Ratio		0.69	1.00		0.69	1.00	0.23		0.23			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3504	1550		3504	2787	793		644			
v/s Ratio Prot		0.62			c0.63							
v/s Ratio Perm			0.47			0.26	0.13		c0.19			
v/c Ratio		0.90	0.47		0.91	0.26	0.57		0.84			
Uniform Delay, d1		12.6	0.0		13.0	0.0	34.0		36.6			
Progression Factor		0.62	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.4	0.1		4.7	0.2	0.6		8.8			
Delay (s)		8.2	0.1		17.7	0.2	34.6		45.5			
Level of Service		A	A		B	A	C		D			
Approach Delay (s)		6.7			14.4			40.5			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
2025 PM

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 800 1070*** 450
Lanes: 1 0 2 0 2

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
			Vol Cnt Date:	n/a			
			Cycle Time (sec):	100			
660***	2					1	390
			Loss Time (sec):	16			
	0					0	
2200	3		Critical V/C:	1.539		3	2270***
	0		Avg Crit Del (sec/veh):	1023.9		0	
820	1		Avg Delay (sec/veh):	609.7		2	190
			LOS:	F			

Lanes: 2 0 2 0 1
Initial Vol: 840*** 420 160
Signal=Protect/Rights=Overlap

Approach:	North Bound L	North Bound T	North Bound R	South Bound L	South Bound T	South Bound R	East Bound L	East Bound T	East Bound R	West Bound L	West Bound T	West Bound R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	840	420	160	450	1070	800	660	2200	820	190	2270	390
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	840	420	160	450	1070	800	660	2200	820	190	2270	390
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	840	420	160	450	1070	800	660	2200	820	190	2270	390
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	840	420	160	450	1070	800	660	2200	820	190	2270	390
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	840	420	160	450	1070	800	660	2200	820	190	2270	390
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	924	420	160	495	1070	800	726	2200	820	209	2270	390
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.34	0.15	0.12	0.18	0.39	0.58	0.26	0.53	0.60	0.08	0.55	0.28
Crit Vol:	462				535		363				757	
Crit Moves:	****				****		****				****	

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project AM

Intersection #1: Valley Hi & Mack

Signal=Protect/Rights=Include
Initial Vol: 52 179 235***
Lanes: 0 1 1 0 2

Signal=Protect Rights=Include (West approach)
Initial Vol: 47, 889***, 187
Lanes: 1, 0, 2, 0, 1

Vol Cnt Date: n/a
Cycle Time (sec): 110
Loss Time (sec): 16
Critical V/C: 0.639
Avg Crit Del (sec/veh): 33.8
Avg Delay (sec/veh): 32.0
LOS: C

Signal=Protect Rights=Include (East approach)
Lanes: 0, 1, 1, 0, 2
Initial Vol: 145, 670, 300***

Lanes: 2 0 1 1 1
Initial Vol: 194 187 740***
Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	10	0	4	6	0	4	26	0	4	30	0
Volume Module:												
Base Vol:	194	187	740	235	179	52	47	889	187	300	670	145
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	194	187	740	235	179	52	47	889	187	300	670	145
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	194	187	740	235	179	52	47	889	187	300	670	145
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	194	187	740	235	179	52	47	889	187	300	670	145
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	194	187	740	235	179	52	47	889	187	300	670	145
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	194	187	740	235	179	52	47	889	187	300	670	145
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.85	0.92	0.92	0.92
Lanes:	2.00	1.00	2.00	2.00	1.55	0.45	1.00	2.00	1.00	2.00	1.64	0.36
Final Sat.:	3502	1588	3177	3502	2702	785	1805	3610	1615	3502	2888	625
Capacity Analysis Module:												
Vol/Sat:	0.06	0.12	0.23	0.07	0.07	0.07	0.03	0.25	0.12	0.09	0.23	0.23
Crit Moves:			****	****				****		****		
Green/Cycle:	0.15	0.23	0.36	0.10	0.18	0.18	0.06	0.39	0.39	0.13	0.46	0.46
Volume/Cap:	0.36	0.51	0.64	0.64	0.36	0.36	0.43	0.64	0.30	0.64	0.51	0.51
Delay/Veh:	42.2	37.2	29.9	51.0	39.7	39.7	52.4	28.6	23.8	48.1	21.3	21.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.2	37.2	29.9	51.0	39.7	39.7	52.4	28.6	23.8	48.1	21.3	21.3
HCM2kAvg:	3	6	11	5	4	4	2	13	4	6	10	10
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	2 0 1 1 1			2 0 1 1 0			1 0 2 0 1			2 0 1 1 0		
Lane Group:	L	RT	RT	L	RT	RT	L	T	R	L	RT	RT
#LnsInGrps:	2	3	3	2	2	2	1	2	1	2	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	1.00	1.00	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	xxxx	0.88	0.88	xxxx	0.97	0.97	xxxx	xxxx	0.85	xxxx	0.97	0.97
LT Adj:	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	0.88	0.88	0.95	0.97	0.97	0.95	1.00	0.85	0.95	0.97	0.97
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.97	0.95	0.95	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	0.95
Fnl Sat Adj:	0.92	0.84	0.84	0.92	0.92	0.92	0.95	0.95	0.85	0.92	0.92	0.92
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Semi-Actuated > > > > > > > > > > > >											
Street Type:		Main			Main			Side			Side	
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #1 Valley Hi & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.15	0.23	0.36	0.10	0.18	0.18	0.06	0.39	0.39	0.13	0.46	0.46
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	2.8	5.0	9.4	3.6	3.1	3.1	1.5	11.1	4.0	4.6	8.8	8.8
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.6	1.0	1.7	1.5	0.6	0.6	0.7	1.7	0.4	1.6	1.0	1.0
HCM2KQueue:	3.4	6.0	11.0	5.1	3.6	3.6	2.1	12.8	4.4	6.1	9.8	9.8
70th%Factor:	1.19	1.19	1.18	1.19	1.19	1.19	1.19	1.17	1.19	1.19	1.18	1.18
70th%HCM2kQ:	4.0	7.1	13.0	6.1	4.3	4.3	2.6	15.0	5.2	7.3	11.5	11.5
85th%Factor:	1.57	1.55	1.51	1.55	1.57	1.57	1.58	1.50	1.56	1.54	1.52	1.52
85th%HCM2kQ:	5.3	9.3	16.6	8.0	5.7	5.7	3.4	19.1	6.9	9.5	14.8	14.8
90th%Factor:	1.74	1.70	1.63	1.71	1.73	1.73	1.76	1.61	1.72	1.69	1.65	1.65
90th%HCM2kQ:	5.8	10.2	18.0	8.8	6.3	6.3	3.8	20.6	7.6	10.4	16.1	16.1
95th%Factor:	2.00	1.93	1.83	1.95	1.99	1.99	2.03	1.80	1.97	1.93	1.85	1.85
95th%HCM2kQ:	6.7	11.6	20.1	10.0	7.3	7.3	4.4	22.9	8.7	11.8	18.1	18.1
98th%Factor:	2.47	2.33	2.13	2.37	2.46	2.46	2.55	2.07	2.41	2.32	2.17	2.17
98th%HCM2kQ:	8.3	14.0	23.5	12.2	9.0	9.0	5.5	26.5	10.6	14.2	21.3	21.3

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project AM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Include
Initial Vol: 384*** 0 0
Lanes: 2 0 0 0 0

Signal=Protect
Rights=Ignore
Initial Vol: Lanes:
0 0
0
1715*** 2
0
199 1

Vol Cnt Date: n/a
Cycle Time (sec): 60
Loss Time (sec): 4
Critical V/C: 0.853
Avg Crit Del (sec/veh): 15.4
Avg Delay (sec/veh): 12.4
LOS: B

Signal=Protect
Rights=Include
Lanes: Initial Vol:
0 0
0
2 730
0
1 336***

Lanes: 0 0 0 0 1
Initial Vol: 0 0 854
Signal=Protect/Rights=Ignore

```
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0    0     0     0    0     4     0   25     0     4   25     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0   854     0    0   384     0 1715   199   336  730     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0   854     0    0   384     0 1715   199   336  730     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0   854     0    0   384     0 1715   199   336  730     0
User Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0    0   384     0 1715     0   336  730     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0     0    0   384     0 1715     0   336  730     0
PCE Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  1.00
Final Vol.:     0    0     0     0    0   384     0 1715     0   336  730     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 1.00  0.75  1.00 0.95  1.00  0.95 0.95  1.00
Lanes:       0.00 0.00  1.00  0.00 0.00  2.00  0.00 2.00  1.00  1.00 2.00  0.00
Final Sat.:     0    0  1900     0    0  2842     0 3610  1900  1805 3610     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.00 0.00  0.14  0.00 0.48  0.00  0.19 0.20  0.00
Crit Moves:                              ****       ****        ****
Green/Cycle: 0.00 0.00  0.00  0.00 0.00  0.18  0.00 0.73  0.00  0.20 0.75  0.00
Volume/Cap:  0.00 0.00  0.00  0.00 0.00  0.75  0.00 0.65  0.00  0.93 0.27  0.00
Delay/Veh:    0.0  0.0   0.0   0.0  0.0  29.5   0.0  4.8   0.0  53.8  2.4   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   0.0  0.0  29.5   0.0  4.8   0.0  53.8  2.4   0.0
HCM2kAvg:       0    0     0     0    0     5     0    9     0    11    2     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         0  0  0  0  1    0  0  0  0  2    0  0  2  0  1    1  0  2  0  0
Lane Group:  xxxx xxxx     R  xxxx xxxx     R  xxxx    T     R     L    T  xxxx
#LnsInGrps:     0    0     1     0    0     2     0    2     1     1    2     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:    12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid         8                8                8                8
% Hev Veh:           0                0                0                0
Grade:              0%               0%               0%               0%
Parking/Hr:         No               No               No               No
Bus Stp/Hr:          0                0                0                0
Area Type:   < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:         0                0                0                0
ExclusiveRT:    Include          Include          Include          Include
% RT Prtct:          0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx     1 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  1.00 1.00 xxxxx
Hev Veh Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  1.00 1.00 xxxxx
Grade Adj:   xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  1.00 1.00 xxxxx
Parking Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx xxxx xxxxx  xxxx 1.00 xxxxx
Bus Stp Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx xxxx xxxxx  xxxx 1.00 xxxxx
Area Adj:    xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  1.00 1.00 xxxxx
RT Adj:      xxxx xxxx xxxxx  xxxx xxxx  0.85  xxxx xxxx xxxxx  xxxx xxxx xxxxx
LT Adj:      xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  0.95 xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 1.00 1.00  1.00  1.00 1.00  0.85  1.00 1.00  1.00  0.95 1.00  1.00
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 1.00  1.00  1.00 1.00  0.88  1.00 0.95  1.00  1.00 0.95  1.00
Fnl Sat Adj: 1.00 1.00  1.00  1.00 1.00  0.75  1.00 0.95  1.00  0.95 0.95  1.00
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < < Semi-Actuated  > > > > > > > > > > > > >
Street Type:      Main             Main             Side             Side
DelAdjFctr:  0.00 0.00  0.00  0.00 0.00  1.00  0.00 1.00  0.00  1.00 1.00  0.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                       2000 HCM Operations Method
```

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Future Volume Alternative

Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.73	0.00	0.20	0.75	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	3.0	0.0	7.4	0.0	5.8	1.9	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	2.3	0.0	1.8	0.0	5.2	0.4	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	5.4	0.0	9.2	0.0	11.0	2.3	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.19	1.20	1.18	1.20	1.18	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	6.4	0.0	10.8	0.0	12.9	2.7	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.55	1.60	1.52	1.60	1.51	1.58	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	8.3	0.0	13.9	0.0	16.6	3.6	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.71	1.80	1.65	1.80	1.63	1.76	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	9.1	0.0	15.1	0.0	17.9	4.0	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.95	2.10	1.86	2.10	1.83	2.03	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	10.4	0.0	17.0	0.0	20.1	4.6	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.36	2.70	2.19	2.70	2.13	2.54	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	12.7	0.0	20.1	0.0	23.4	5.8	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project AM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Overlap
Initial Vol: 40 396 230***
Lanes: 1 0 2 0 1

Initial Vol:	Lanes:	Signal=Split Rights=Overlap			Signal=Split Rights=Overlap	Lanes:	Initial Vol:
60	1		Vol Cnt Date:	n/a		2	270
			Cycle Time (sec):	90			
	0		Loss Time (sec):	16		0	
40***	1!		Critical V/C:	0.516		0	50***
	0		Avg Crit Del (sec/veh):	25.6		1	
10	0		Avg Delay (sec/veh):	21.9		1	75
			LOS:	C			

Lanes: 1 0 2 0 1
Initial Vol: 25 791*** 150
Signal=Protect/Rights=Overlap

```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    4    4     0     6    6     0     0    4     0     0    4     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     25  791   150   230  396    40    60   40    10    75   50   270
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  25  791   150   230  396    40    60   40    10    75   50   270
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  25  791   150   230  396    40    60   40    10    75   50   270
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   25  791   150   230  396    40    60   40    10    75   50   270
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  25  791   150   230  396    40    60   40    10    75   50   270
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   25  791   150   230  396    40    60   40    10    75   50   270
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
Lanes:      1.00 2.00  1.00  1.00 2.00  1.00  1.37 0.50  0.13  1.20 0.80  2.00
Final Sat.: 1805 3610  1615  1805 3610  1615  2506  911   228  2214 1476  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.01 0.22  0.09  0.13 0.11  0.02  0.02 0.04  0.04  0.03 0.03  0.09
Crit Moves:      ****        ****                   ****             ****
Green/Cycle: 0.19 0.42  0.49  0.25 0.48  0.56  0.09 0.09  0.28  0.07 0.07  0.31
Volume/Cap: 0.07 0.52  0.19  0.52 0.23  0.04  0.28 0.52  0.16  0.52 0.52  0.30
Delay/Veh:  29.8 19.4  13.0  30.3 13.8   8.8  39.0 41.6  24.6  42.6 42.6  23.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 29.8 19.4  13.0  30.3 13.8   8.8  39.0 41.6  24.6  42.6 42.6  23.7
HCM2kAvg:      1    8     2     6    3     0     1    3     2     3    3     3
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:        1  0  2  0  1   1  0  2  0  1   1  0  1! 0  0   1  1  0  0  2
Lane Group:    L    T     R     L    T     R   LTR  LTR   LTR    LT   LT     R
#LnsInGrps:    1    2     1     1    2     1     2    1     1     2    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid       8                8                8                8
% Hev Veh:         0                0                0                0
Grade:            0%               0%               0%               0%
Parking/Hr:       No               No               No               No
Bus Stp/Hr:        0                0                0                0
Area Type:   < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:       0                0                0                0
ExclusiveRT:   Include          Include          Include          Include
% RT Prtct:        0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx     1 xxxx  xxxx     4    4     4     4    4  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Hev Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Grade Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Parking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Bus Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  xxxx xxxx  1.00
Area Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
RT Adj:     xxxx xxxx  0.85  xxxx xxxx  0.85  0.99 0.99  0.99  xxxx xxxx  0.85
LT Adj:     0.95 xxxx xxxxx  0.95 xxxx xxxxx  0.97 0.97  0.97  0.97 0.97 xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  0.85  0.95 1.00  0.85  0.96 0.96  0.96  0.97 0.97  0.85
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  1.00  1.00 1.00  1.00  1.00 1.00  0.88
Fnl Sat Adj: 0.95 0.95  0.85  0.95 0.95  0.85  0.96 0.96  0.96  0.97 0.97  0.75
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < < No    > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
     Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                       2000 HCM Operations Method
                        Future Volume Alternative
```

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Intersection #3 Valley Hi & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.19	0.42	0.49	0.25	0.48	0.56	0.09	0.09	0.28	0.07	0.07	0.31
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.5	7.3	2.1	5.2	2.9	0.4	1.1	2.0	1.6	1.6	1.6	2.6
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.1	1.0	0.2	1.0	0.3	0.0	0.4	1.0	0.2	0.9	0.9	0.4
HCM2KQueue:	0.6	8.3	2.3	6.3	3.2	0.5	1.4	2.9	1.7	2.5	2.5	3.0
70th%Factor:	1.20	1.18	1.19	1.19	1.19	1.20	1.20	1.19	1.20	1.19	1.19	1.19
70th%HCM2kQ:	0.7	9.8	2.8	7.4	3.8	0.6	1.7	3.5	2.1	3.0	3.0	3.6
85th%Factor:	1.59	1.53	1.58	1.54	1.57	1.60	1.59	1.57	1.58	1.58	1.58	1.57
85th%HCM2kQ:	1.0	12.7	3.7	9.7	5.0	0.8	2.3	4.6	2.7	3.9	3.9	4.7
90th%Factor:	1.79	1.66	1.76	1.69	1.74	1.79	1.77	1.75	1.77	1.75	1.75	1.74
90th%HCM2kQ:	1.1	13.9	4.1	10.6	5.6	0.9	2.5	5.1	3.1	4.4	4.4	5.2
95th%Factor:	2.08	1.88	2.03	1.92	2.00	2.08	2.05	2.01	2.04	2.02	2.02	2.01
95th%HCM2kQ:	1.3	15.6	4.7	12.0	6.4	1.0	2.9	5.9	3.6	5.1	5.1	6.0
98th%Factor:	2.65	2.23	2.54	2.32	2.48	2.66	2.60	2.50	2.57	2.52	2.52	2.49
98th%HCM2kQ:	1.6	18.5	5.9	14.5	7.9	1.3	3.7	7.3	4.5	6.3	6.3	7.5

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 + Project AM

Intersection #4: Valley Hi & Wyndham

Signal=Uncontrol/Rights=Include
Initial Vol: 0 416 80
Lanes: 0 0 2 0 1

Signal=Stop
Rights=Include

Initial Vol:	Lanes:
0	0
	0
0	0
	0
0	0

Vol Cnt Date:	n/a
Cycle Time (sec):	100
Loss Time (sec):	0
Critical V/C:	0.000
Avg Crit Del (sec/veh):	2.6
Avg Delay (sec/veh):	2.6
LOS:	C

Signal=Stop
Rights=Include

Lanes:	Initial Vol:
1	125
0	
0	0
0	
1	44

Lanes: 0 0 1 1 0
Initial Vol: 0 846 80
Signal=Uncontrol/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  846    80    80  416     0     0    0     0    44    0   125
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  846    80    80  416     0     0    0     0    44    0   125
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0  846    80    80  416     0     0    0     0    44    0   125
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  846    80    80  416     0     0    0     0    44    0   125
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  846    80    80  416     0     0    0     0    44    0   125
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   926 xxxx xxxxx  xxxx xxxx xxxxx  1254 xxxx   463
Potent Cap.: xxxx xxxx xxxxx   746 xxxx xxxxx  xxxx xxxx xxxxx   167 xxxx   551
Move Cap.:   xxxx xxxx xxxxx   746 xxxx xxxxx  xxxx xxxx xxxxx   153 xxxx   551
Volume/Cap:  xxxx xxxx  xxxx  0.11 xxxx  xxxx  xxxx xxxx  xxxx  0.29 xxxx  0.23
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.4 xxxx xxxxx xxxxx xxxx xxxxx   1.1 xxxx   0.9
Stopped Del:xxxxx xxxx xxxxx  10.4 xxxx xxxxx xxxxx xxxx xxxxx  37.8 xxxx  13.4
LOS by Move:    *    *     *     B    *     *     *    *     *     E    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            19.8
ApproachLOS:        *                *                *                C
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:       12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                      #5
Dist(miles):                     0.000
Speed (mph):                      0.00
SignalIndex:                     #3
Cycle Time:                           0 secs
InitVolume:                   0      0
Saturation:                   0      0
ArrivalType:                  0      0
G/C:                       0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                        0.000 0.000
gq1:                       0.00  0.00
gq2:                       0.00  0.00
gq:                        0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                          0.000
beta:                           0.000
ta (secs):                      0.000
F:                              0.000
f:                        0.000 0.000
vcmax:                        0      0
vcg:                          0      0
vcmin:                        0      0
tp:                         0.0    0.0
p:                              0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:    0 xxxxx xxxxx  926 xxxxx xxxxx    0     0     0 1254     0   463
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:    0 xxxxx xxxxx  926 xxxxx xxxxx    0     0     0 1254     0   463
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx  746 xxxxx xxxxx  900   900   900  167   900   551
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:   900 xxxxx xxxxx  746 xxxxx xxxxx  900   900   900  167   900   551
                       Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #4 Valley Hi & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Lanes:       0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:    0  846    80    80  416     0     0    0     0    44     0   125
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            19.8
-----------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.9]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=169]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1591]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #4 Valley Hi & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
-----------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Lanes:       0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:    0  846    80    80  416     0     0    0     0    44     0   125
-----------|---------------||---------------||---------------||---------------|
Major Street Volume:            1422
Minor Approach Volume:          169
Minor Approach Volume Threshold: 223
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project AM

Intersection #5: Alta Valley & Bruceville

Signal=Split/Rights=Overlap
Initial Vol: 60 185*** 270
Lanes: 0 1 0 1 1

Signal=Protect
Rights=Overlap

Initial Vol:	Lanes:
125***	1
	0
185	1
	1
110	0

Vol Cnt Date:	n/a
Cycle Time (sec):	80
Loss Time (sec):	16
Critical V/C:	0.480
Avg Crit Del (sec/veh):	26.5
Avg Delay (sec/veh):	24.1
LOS:	C

Signal=Protect
Rights=Overlap

Lanes:	Initial Vol:
0	264
1	
1	290***
0	
1	268

Lanes: 0 1 0 1 0
Initial Vol: 50 105*** 20
Signal=Split/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	50	105	20	270	185	60	125	185	110	268	290	264
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	50	105	20	270	185	60	125	185	110	268	290	264
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	50	105	20	270	185	60	125	185	110	268	290	264
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	50	105	20	270	185	60	125	185	110	268	290	264
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	50	105	20	270	185	60	125	185	110	268	290	264
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	50	105	20	270	185	60	125	185	110	268	290	264
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.90	0.90	0.95	0.88	0.88
Lanes:	0.57	1.20	0.23	1.57	1.08	0.35	1.00	1.25	0.75	1.00	1.05	0.95
Final Sat.:	1000	2099	400	2715	1861	603	1805	2137	1271	1805	1754	1596
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.05	0.10	0.10	0.10	0.07	0.09	0.09	0.15	0.17	0.17
Crit Moves:		****			****		****				****	
Green/Cycle:	0.10	0.10	0.41	0.21	0.21	0.35	0.14	0.18	0.28	0.31	0.34	0.55
Volume/Cap:	0.48	0.48	0.12	0.48	0.48	0.28	0.48	0.48	0.30	0.48	0.48	0.30
Delay/Veh:	34.8	34.8	14.6	28.3	28.3	18.8	32.9	30.0	22.6	23.1	20.9	9.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.8	34.8	14.6	28.3	28.3	18.8	32.9	30.0	22.6	23.1	20.9	9.7
HCM2kAvg:	3	3	1	4	4	3	4	4	3	6	6	4
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 1 0 1 0			1 1 0 1 0			1 0 1 1 0			1 0 1 1 0		
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.98	0.98	0.98	0.98	0.98	0.98	xxxx	0.94	0.94	xxxx	0.93	0.93
LT Adj:	0.99	0.99	0.99	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.97	0.97	0.97	0.96	0.96	0.96	0.95	0.94	0.94	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.90	0.90	0.95	0.88	0.88
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.10	0.10	0.41	0.21	0.21	0.35	0.14	0.18	0.28	0.31	0.34	0.55
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	1.9	1.9	1.2	3.4	3.4	2.8	2.7	2.9	2.6	5.1	4.8	3.3
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	0.9	0.9	0.1	0.9	0.9	0.4	0.9	0.9	0.4	0.9	0.9	0.4
HCM2KQueue:	2.7	2.7	1.4	4.3	4.3	3.2	3.6	3.8	3.0	6.0	5.7	3.7
70th%Factor:	1.19	1.19	1.20	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
70th%HCM2kQ:	3.2	3.2	1.6	5.2	5.2	3.8	4.3	4.6	3.6	7.1	6.8	4.4
85th%Factor:	1.57	1.57	1.59	1.56	1.56	1.57	1.57	1.56	1.57	1.55	1.55	1.56
85th%HCM2kQ:	4.3	4.3	2.2	6.8	6.8	5.0	5.6	6.0	4.7	9.3	8.9	5.8
90th%Factor:	1.75	1.75	1.77	1.72	1.72	1.74	1.73	1.73	1.74	1.70	1.70	1.73
90th%HCM2kQ:	4.8	4.8	2.4	7.5	7.5	5.6	6.2	6.6	5.2	10.2	9.8	6.5
95th%Factor:	2.02	2.02	2.06	1.97	1.97	2.00	1.99	1.99	2.01	1.93	1.94	1.99
95th%HCM2kQ:	5.5	5.5	2.8	8.6	8.6	6.4	7.1	7.6	6.0	11.6	11.1	7.4
98th%Factor:	2.51	2.51	2.60	2.42	2.42	2.48	2.46	2.44	2.49	2.33	2.34	2.45
98th%HCM2kQ:	6.8	6.8	3.5	10.5	10.5	8.0	8.8	9.4	7.5	14.0	13.4	9.1

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project AM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 346*** 0 322
Lanes: 1 0 0 0 1

Initial Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Initial Vol:
205***	1					0	64
	0		Vol Cnt Date:	n/a		1	
270	2		Cycle Time (sec):	90		1	476***
	0		Loss Time (sec):	14		0	
0	0		Critical V/C:	0.569		0	0
			Avg Crit Del (sec/veh):	28.5			
			Avg Delay (sec/veh):	24.8			
			LOS:	C			

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Protect/Rights=Include

```
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    0    0     0     4    0     0     4    6     0     0    6     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0     0   322    0   346   205  270     0     0  476    64
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0   322    0   346   205  270     0     0  476    64
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0    0     0   322    0   346   205  270     0     0  476    64
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0   322    0   346   205  270     0     0  476    64
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0     0   322    0   346   205  270     0     0  476    64
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0     0   322    0   346   205  270     0     0  476    64
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.95 1.00  0.85  0.95 0.95  1.00  1.00 0.93  0.93
Lanes:       0.00 0.00  0.00  1.00 0.00  1.00  1.00 2.00  0.00  0.00 1.76  0.24
Final Sat.:    0    0     0  1805    0  1615  1805 3610     0     0 3125   420
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.18 0.00  0.21  0.11 0.07  0.00  0.00 0.15  0.15
Crit Moves:                              ****  ****                   ****
Green/Cycle: 0.00 0.00  0.00  0.38 0.00  0.38  0.20 0.47  0.00  0.00 0.27  0.27
Volume/Cap:  0.00 0.00  0.00  0.47 0.00  0.57  0.57 0.16  0.00  0.00 0.57  0.57
Delay/Veh:    0.0  0.0   0.0  21.8  0.0  23.5  34.7 13.8   0.0   0.0 29.3  29.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  21.8  0.0  23.5  34.7 13.8   0.0   0.0 29.3  29.3
HCM2kAvg:      0    0     0     7    0     8     6    2     0     0    7     7
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:          0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
Lane Group:  xxxx xxxx  xxxx     L xxxx     R     L    T  xxxx  xxxx  RT    RT
#LnsInGrps:    0    0     0     1    0     1     1    2     0     0    2     2
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid       8                8                8                8
% Hev Veh:         0                0                0                0
Grade:            0%               0%               0%               0%
Parking/Hr:       No               No               No               No
Bus Stp/Hr:        0                0                0                0
Area Type:    < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:       0                0                0                0
ExclusiveRT:    Include          Include          Include          Include
% RT Prtct:        0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:  xxxx xxxx  xxxx     1 xxxx  xxxx     1 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
Hev Veh Adj: xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
Grade Adj:   xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
Parking Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  xxxx 1.00  1.00
Bus Stp Adj: xxxx xxxx xxxxx  xxxx xxxx  1.00  xxxx 1.00 xxxxx  xxxx 1.00  1.00
Area Adj:    xxxx xxxx xxxxx  1.00 xxxx  1.00  1.00 1.00 xxxxx  xxxx 1.00  1.00
RT Adj:      xxxx xxxx xxxxx  xxxx xxxx  0.85  xxxx xxxx xxxxx  xxxx 0.98  0.98
LT Adj:      xxxx xxxx xxxxx  0.95 xxxx xxxxx  0.95 xxxx xxxxx  xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 1.00 1.00  1.00  0.95 1.00  0.85  0.95 1.00  1.00  1.00 0.98  0.98
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.95  1.00  1.00 0.95  0.95
Fnl Sat Adj: 1.00 1.00  1.00  0.95 1.00  0.85  0.95 0.95  1.00  1.00 0.93  0.93
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated: < < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type: < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > > >
DelAdjFctr:  0.00 0.00  0.00  1.00 0.00  1.00  1.00 1.00  0.00  0.00 1.00  1.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
```


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```
********************************************************************************
Intersection #6 SR 99 SB Ramps & Bruceville
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Green/Cycle: 0.00 0.00  0.00  0.38 0.00  0.38  0.20 0.47  0.00  0.00 0.27  0.27
ArrivalType:       3                3                3                3
ProgFactor:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Q1:           0.0  0.0   0.0   6.4  0.0   6.9   4.9  1.9   0.0   0.0  5.8   5.8
UpstreamVC:  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00
UpstreamAdj: 0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00
EarlyArrAdj: 0.00 0.00  0.00  1.00 0.00  1.00  1.00 1.00  0.00  0.00 1.00  1.00
Q2:           0.0  0.0   0.0   0.9  0.0   1.3   1.2  0.2   0.0   0.0  1.3   1.3
HCM2KQueue:   0.0  0.0   0.0   7.3  0.0   8.1   6.1  2.1   0.0   0.0  7.1   7.1
------------|---------------||---------------||---------------||---------------|
70th%Factor: 1.20 1.20  1.20  1.18 1.20  1.18  1.19 1.19  1.20  1.20 1.18  1.18
70th%HCM2kQ:  0.0  0.0   0.0   8.6  0.0   9.6   7.2  2.5   0.0   0.0  8.4   8.4
------------|---------------||---------------||---------------||---------------|
85th%Factor: 1.60 1.60  1.60  1.54 1.60  1.53  1.54 1.58  1.60  1.60 1.54  1.54
85th%HCM2kQ:  0.0  0.0   0.0  11.2  0.0  12.4   9.4  3.4   0.0   0.0 10.9  10.9
------------|---------------||---------------||---------------||---------------|
90th%Factor: 1.80 1.80  1.80  1.68 1.80  1.67  1.69 1.76  1.80  1.80 1.68  1.68
90th%HCM2kQ:  0.0  0.0   0.0  12.3  0.0  13.5  10.4  3.8   0.0   0.0 11.9  11.9
------------|---------------||---------------||---------------||---------------|
95th%Factor: 2.10 2.10  2.10  1.90 2.10  1.88  1.93 2.03  2.10  2.10 1.90  1.90
95th%HCM2kQ:  0.0  0.0   0.0  13.9  0.0  15.3  11.8  4.3   0.0   0.0 13.5  13.5
------------|---------------||---------------||---------------||---------------|
98th%Factor: 2.70 2.70  2.70  2.27 2.70  2.24  2.32 2.55  2.70  2.70 2.28  2.28
98th%HCM2kQ:  0.0  0.0   0.0  16.6  0.0  18.2  14.2  5.4   0.0   0.0 16.2  16.2
```

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 + Project AM

Intersection #7: Bruceville / Kaiser Access

Signal=Stop/Rights=Include
Initial Vol: 152 440 0
Lanes: 0 1 1 0 0

Signal=Uncontrol
Rights=Include

Initial Vol:	Lanes:
44	0
	0
0	1!
	0
106	0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 64.2
Avg Delay (sec/veh): 64.2
LOS: F

Signal=Uncontrol
Rights=Include

Lanes:	Initial Vol:
0	0
0	
0	0
0	
0	0

Lanes: 1 0 1 0 0
Initial Vol: 322 512 0
Signal=Stop/Rights=Include

```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     322  512     0     0  440   152    44     0   106     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  322  512     0     0  440   152    44     0   106     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:  322  512     0     0  440   152    44     0   106     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   322  512     0     0  440   152    44     0   106     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:   322  512     0     0  440   152    44     0   106     0     0     0
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx xxxxx  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx xxxxx  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  361  141 xxxxx  xxxx  194     0     0 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  598  754 xxxxx  xxxx  705   900   900 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    227  716 xxxxx  xxxx  670   900   900 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  1.42 0.72  xxxx  xxxx 0.66  0.17  0.05 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       18.4  6.1 xxxxx xxxxx  1.4 xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:253.2 21.6 xxxxx xxxxx 13.0 xxxxx   9.2 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    F    C     *     *    B     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx   748  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx   2.8 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx  14.5 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     B     *    *     *     *    *     *
ApproachDel:      111.0             13.9             xxxxxx            xxxxxx
ApproachLOS:        F                 B                 *                 *
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%                0%                0%                0%
Grade:              0%                0%                0%                0%
Peds/Hour:          0                 0                 0                 0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet           12 feet           12 feet           12 feet
Time Period: 0.25 hour
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #7 Bruceville / Kaiser Access
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        1  0  1  0  0   0  0  1  1  0   0  0  1! 0  0   0  0  0  0  0
Final Vol.:   322  512     0     0  440   152    44     0   106     0     0     0
ApproachDel:      111.0             13.9             xxxxxx            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=25.7]
    SUCCEED - Vehicle-hours >= 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=834]
    SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1576]
    SUCCEED - Total volume greater than or equal to 650 for intersection
              with less than four approaches.
-------------------------------------------------------------------------------
Approach[southbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=2.3]
    FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=592]
    SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1576]
    SUCCEED - Total volume greater than or equal to 650 for intersection
              with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #7 Bruceville / Kaiser Access
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```


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```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        1  0  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
Final Vol.:   322  512     0     0  440   152   44    0   106     0     0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            150
Minor Approach Volume:          834
Minor Approach Volume Threshold: 889
```


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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project AM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 146 400*** 0
Lanes: 0 1 1 0 0

Signal=Protect
Rights=Overlap
Initial Vol: Lanes:
70*** 1
0
0 0
0
129 1

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 12
Critical V/C: 0.372
Avg Crit Del (sec/veh): 23.9
Avg Delay (sec/veh): 14.3
LOS: B

Signal=Protect
Rights=Include
Lanes: Initial Vol:
0 0
0
0 0
0
0 0

Lanes: 1 0 2 0 0
Initial Vol: 240*** 764 0
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	5	6	0	0	6	0	4	0	5	0	0	0
Volume Module:												
Base Vol:	240	764	0	0	400	146	70	0	129	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	240	764	0	0	400	146	70	0	129	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	764	0	0	400	146	70	0	129	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	240	764	0	0	400	146	70	0	129	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	764	0	0	400	146	70	0	129	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	240	764	0	0	400	146	70	0	129	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.91	0.91	0.95	1.00	0.85	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.47	0.53	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	1805	3610	0	0	2539	927	1805	0	1615	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.13	0.21	0.00	0.00	0.16	0.16	0.04	0.00	0.08	0.00	0.00	0.00
Crit Moves:	****				****		****					
Green/Cycle:	0.36	0.78	0.00	0.00	0.42	0.42	0.10	0.00	0.46	0.00	0.00	0.00
Volume/Cap:	0.37	0.27	0.00	0.00	0.37	0.37	0.37	0.00	0.17	0.00	0.00	0.00
Delay/Veh:	25.1	3.2	0.0	0.0	20.7	20.7	44.7	0.0	16.5	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.1	3.2	0.0	0.0	20.7	20.7	44.7	0.0	16.5	0.0	0.0	0.0
HCM2kAvg:	6	3	0	0	6	6	3	0	2	0	0	0

HCM Ops Adjusted Lane Utilization Module:

	North Bound	South Bound	East Bound	West Bound
Lanes:	1 0 2 0 0	0 0 1 1 0	1 0 0 0 1	0 0 0 0 0

	L	T	R	L	T	R	L	T	R	L	T	R
Lane Group:	L	T	xxxx	xxxx	RT	RT	L	xxxx	R	xxxx	xxxx	xxxx
#LnsInGrps:	1	2	0	0	2	2	1	0	1	0	0	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Hev Veh Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Grade Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
Parking Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Bus Stp Adj:	xxxx	1.00	xxxxx	xxxx	1.00	1.00	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx
Area Adj:	1.00	1.00	xxxxx	xxxx	1.00	1.00	1.00	xxxx	1.00	xxxx	xxxx	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	0.96	0.96	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx
LT Adj:	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	1.00	1.00	0.96	0.96	0.95	1.00	0.85	1.00	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fnl Sat Adj:	0.95	0.95	1.00	1.00	0.91	0.91	0.95	1.00	0.85	1.00	1.00	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.36	0.78	0.00	0.00	0.42	0.42	0.10	0.00	0.46	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	5.4	3.1	0.0	0.0	5.4	5.4	2.0	0.0	2.2	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.6	0.4	0.0	0.0	0.6	0.6	0.6	0.0	0.2	0.0	0.0	0.0
HCM2KQueue:	6.0	3.4	0.0	0.0	6.0	6.0	2.6	0.0	2.4	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	7.1	4.1	0.0	0.0	7.1	7.1	3.1	0.0	2.9	0.0	0.0	0.0
85th%Factor:	1.55	1.57	1.60	1.60	1.55	1.55	1.58	1.60	1.58	1.60	1.60	1.60
85th%HCM2kQ:	9.3	5.4	0.0	0.0	9.3	9.3	4.0	0.0	3.8	0.0	0.0	0.0
90th%Factor:	1.70	1.74	1.80	1.80	1.70	1.70	1.75	1.80	1.75	1.80	1.80	1.80
90th%HCM2kQ:	10.2	6.0	0.0	0.0	10.2	10.2	4.5	0.0	4.2	0.0	0.0	0.0
95th%Factor:	1.93	2.00	2.10	2.10	1.93	1.93	2.02	2.10	2.03	2.10	2.10	2.10
95th%HCM2kQ:	11.6	6.9	0.0	0.0	11.6	11.6	5.2	0.0	4.8	0.0	0.0	0.0
98th%Factor:	2.33	2.47	2.70	2.70	2.33	2.33	2.52	2.70	2.53	2.70	2.70	2.70
98th%HCM2kQ:	14.0	8.5	0.0	0.0	14.0	14.0	6.4	0.0	6.1	0.0	0.0	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 + Project AM

Intersection #9: Arroyo Vista & Wyndham

Signal=Stop/Rights=Include
Initial Vol: 40 0 69
Lanes: 0 1 0 0 1

Signal=Uncontrol Rights=Include (West approach)
Initial Vol: 80, 105, 20
Lanes: 0, 0, 0, 1, 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.000
Avg Crit Del (sec/veh): 4.0
Avg Delay (sec/veh): 4.0
LOS: B

Signal=Uncontrol Rights=Include (East approach)
Lanes: 0, 0, 1, 0, 1
Initial Vol: 165, 165, 20

Lanes: 0 0 1! 0 0
Initial Vol: 25 0 20
Signal=Stop/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	25	0	20	69	0	40	80	105	20	20	165	165
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	0	20	69	0	40	80	105	20	20	165	165
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	25	0	20	69	0	40	80	105	20	20	165	165
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	25	0	20	69	0	40	80	105	20	20	165	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	25	0	20	69	0	40	80	105	20	20	165	165
Critical Gap Module:												
Critical Gp:	7.1	xxxx	6.2	7.1	xxxx	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	3.5	xxxx	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	583	xxxx	115	572	xxxx	248	330	xxxx	xxxxx	125	xxxx	xxxxx
Potent Cap.:	427	xxxx	943	434	xxxx	796	1241	xxxx	xxxxx	1474	xxxx	xxxxx
Move Cap.:	381	xxxx	943	398	xxxx	796	1241	xxxx	xxxxx	1474	xxxx	xxxxx
Volume/Cap:	0.07	xxxx	0.02	0.17	xxxx	0.05	0.06	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.6	xxxx	xxxxx	0.2	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	15.9	xxxx	xxxxx	8.1	xxxx	xxxxx	7.5	xxxx	xxxxx
LOS by Move:	*	*	*	C	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	518	xxxxx	xxxx	xxxx	796	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.3	xxxxx	xxxxx	xxxx	0.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	12.6	xxxxx	xxxxx	xxxx	9.8	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	B	*	*	*	A	*	*	*	*	*	*
ApproachDel:		12.6			13.7			xxxxxx			xxxxxx	
ApproachLOS:		B			B			*			*	

Peak Hour Delay Signal Warrant Report

Intersection #9 Arroyo Vista & Wyndham

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound	South Bound	East Bound	West Bound

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```
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Lanes:        0  0  1! 0  0   1  0  0  1  0   0  0  1! 0  0   1  0  0  1  0
Final Vol.:    25    0    20   69    0    40   80  105    20   20  165   165
ApproachDel:      12.6              13.7            xxxxxx            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=45]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=709]
   FAIL - Total volume less than 800 for intersection
          with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=109]
   FAIL - Approach volume less than 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=709]
   FAIL - Total volume less than 800 for intersection
          with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Lanes:        0  0  1! 0  0   1  0  0  1  0   0  0  1! 0  0   1  0  0  1  0
Final Vol.:    25    0    20   69    0    40   80  105    20   20  165   165
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            555
Minor Approach Volume:          109
Minor Approach Volume Threshold: 627
```

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HCM Signalized Intersection Capacity Analysis
11: Cosumnes River Blvd & Bruceville Rd

2/22/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.94	0.91	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
Volume (vph)	210	720	430	1800	1290	668	700	936	1430	359	644	44
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	210	720	430	1800	1290	668	700	936	1430	359	644	44
RTOR Reduction (vph)	0	0	206	0	0	130	0	0	574	0	0	33
Lane Group Flow (vph)	210	720	224	1800	1290	538	700	936	856	359	644	11
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	9.2	25.5	25.5	38.7	55.0	55.0	23.1	44.2	44.2	12.1	33.2	33.2
Effective Green, g (s)	8.7	26.2	26.2	38.2	55.7	55.7	22.1	44.9	44.9	11.1	33.9	33.9
Actuated g/C Ratio	0.06	0.19	0.19	0.28	0.41	0.41	0.16	0.33	0.33	0.08	0.25	0.25
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	219	977	300	1397	2076	637	556	1165	904	279	880	388
v/s Ratio Prot	0.06	0.14		c0.36	0.25		c0.20	0.26		0.10	0.18	
v/s Ratio Perm			0.14			c0.35			c0.31			0.01
v/c Ratio	0.96	0.74	0.75	1.29	0.62	0.85	1.26	0.80	0.95	1.29	0.73	0.03
Uniform Delay, d1	63.7	51.9	52.0	49.1	32.0	36.5	57.2	41.7	44.6	62.6	47.1	38.8
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	48.3	2.5	8.6	135.3	0.4	9.7	130.6	3.9	18.1	153.4	2.7	0.0
Delay (s)	112.0	54.4	60.5	184.4	32.4	46.1	187.7	45.6	62.7	216.0	49.8	38.8
Level of Service	F	D	E	F	C	D	F	D	E	F	D	D
Approach Delay (s)		65.2			107.7			86.0			106.3	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	94.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	136.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱				↰↰		↱
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	2253	256	0	2748	420	0	0	0	990	0	1110
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2253	256	0	2748	420	0	0	0	990	0	1110
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2253	256	0	2748	420	0	0	0	990	0	1110
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		39.0	100.0		38.8	100.0				50.8		50.8
Effective Green, g (s)		40.0	100.0		40.0	100.0				52.0		52.0
Actuated g/C Ratio		0.40	1.00		0.40	1.00				0.52		0.52
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2034	1583		2034	2787				1785		823
v/s Ratio Prot		0.44			c0.54							
v/s Ratio Perm			0.16			0.15				0.29		c0.70
v/c Ratio		1.11	0.16		1.35	0.15				0.55		1.35
Uniform Delay, d1		30.0	0.0		30.0	0.0				16.2		24.0
Progression Factor		1.00	1.00		0.89	1.00				1.00		1.00
Incremental Delay, d2		56.3	0.2		160.3	0.1				0.2		165.0
Delay (s)		86.3	0.2		187.2	0.1				16.4		189.0
Level of Service		F	A		F	A				B		F
Approach Delay (s)		77.5			162.4			0.0			107.6	
Approach LOS		E			F			A			F	

Intersection Summary			
HCM Average Control Delay	120.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	128.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱	↰↰		↱↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	2063	1170	0	2623	1220	545	0	470	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2063	1170	0	2623	1220	545	0	470	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	17	0	0	0
Lane Group Flow (vph)	0	2063	1170	0	2623	1220	545	0	453	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		70.2	100.0		70.5	100.0	19.2		19.2			
Effective Green, g (s)		71.5	100.0		71.5	100.0	20.5		20.5			
Actuated g/C Ratio		0.72	1.00		0.72	1.00	0.20		0.20			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3636	1550		3636	2787	704		571			
v/s Ratio Prot		0.41			0.52							
v/s Ratio Perm			c0.75			0.44	0.16		0.16			
v/c Ratio		0.57	0.75		0.72	0.44	0.77		0.79			
Uniform Delay, d1		6.8	0.0		8.4	0.0	37.6		37.7			
Progression Factor		0.73	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.2	1.2		1.3	0.5	4.9		6.9			
Delay (s)		5.2	1.2		9.7	0.5	42.4		44.7			
Level of Service		A	A		A	A	D		D			
Approach Delay (s)		3.8			6.8			43.5			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
2025 + Project AM MITIGATED

Intersection #14: CALVINE RD / POWER INN RD

Signal=Protect/Rights=Overlap
Initial Vol: 420 480*** 350
Lanes: 1 0 2 0 2

Signal=Protect Rights=Overlap

Initial Vol:	Lanes:
500***	2
	0
1393	3
	0
640	1

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 16
Critical V/C: 1.423
Avg Crit Del (sec/veh): 743.3
Avg Delay (sec/veh): 450.8
LOS: F

Signal=Protect Rights=Overlap

Lanes:	Initial Vol:
1	420
0	
3	2033***
0	
2	180

Lanes: 2 0 2 0 1
Initial Vol: 1390*** 1350 200
Signal=Protect/Rights=Overlap

Approach:	North Bound L	North Bound T	North Bound R	South Bound L	South Bound T	South Bound R	East Bound L	East Bound T	East Bound R	West Bound L	West Bound T	West Bound R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	1390	1350	200	350	480	420	500	1393	640	180	2033	420
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1390	1350	200	350	480	420	500	1393	640	180	2033	420
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1390	1350	200	350	480	420	500	1393	640	180	2033	420
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1390	1350	200	350	480	420	500	1393	640	180	2033	420
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1390	1350	200	350	480	420	500	1393	640	180	2033	420
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	1529	1350	200	385	480	420	550	1393	640	198	2033	420
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.56	0.49	0.15	0.14	0.17	0.31	0.20	0.34	0.47	0.07	0.49	0.31
Crit Vol:	765				240		275				678	
Crit Moves:	****				****		****				****	

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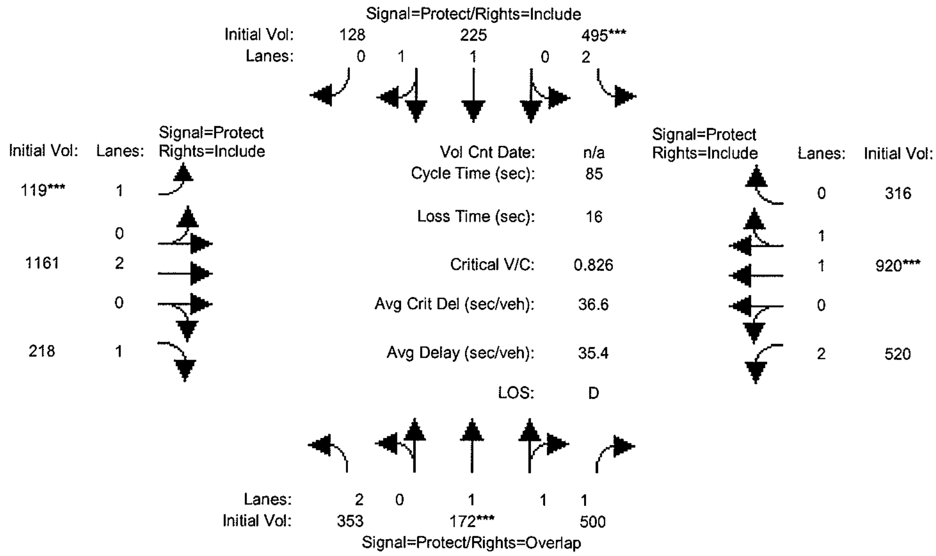
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project PM

Intersection #1: Valley Hi & Mack



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	10	0	4	6	0	4	26	0	4	38	0
Volume Module:												
Base Vol:	353	172	500	495	225	128	119	1161	218	520	920	316
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	353	172	500	495	225	128	119	1161	218	520	920	316
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Project Tri:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	353	172	500	495	225	128	119	1161	218	520	920	316
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	353	172	500	495	225	128	119	1161	218	520	920	316
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	353	172	500	495	225	128	119	1161	218	520	920	316
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	353	172	500	495	225	128	119	1161	218	520	920	316
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.84	0.84	0.92	0.90	0.90	0.95	0.95	0.85	0.92	0.91	0.91
Lanes:	2.00	1.00	2.00	2.00	1.27	0.73	1.00	2.00	1.00	2.00	1.49	0.51
Final Sat.:	3502	1603	3206	3502	2177	1238	1805	3610	1615	3502	2585	888
Capacity Analysis Module:												
Vol/Sat:	0.10	0.11	0.16	0.14	0.10	0.10	0.07	0.32	0.13	0.15	0.36	0.36
Crit Moves:		****		****			****				****	
Green/Cycle:	0.14	0.12	0.29	0.16	0.15	0.15	0.08	0.36	0.36	0.17	0.45	0.45
Volume/Cap:	0.71	0.86	0.54	0.86	0.71	0.71	0.86	0.90	0.38	0.90	0.80	0.80
Delay/Veh:	39.4	46.3	25.9	47.3	39.2	39.2	77.9	34.4	20.7	51.5	23.1	23.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.4	46.3	25.9	47.3	39.2	39.2	77.9	34.4	20.7	51.5	23.1	23.1
HCM2kAvg:	6	7	6	10	6	6	6	18	4	11	16	16

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project PM

Intersection #2: Alta Valley & Mack

Signal=Protect/Rights=Overlap
Initial Vol: 575*** 0 0
Lanes: 2 0 0 0 0

Initial Vol:	Lanes:	Signal=Protect Rights=Ignore			Signal=Protect Rights=Include	Lanes:	Initial Vol:
0	0		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	60			
	0		Loss Time (sec):	8		0	
1965***	2		Critical V/C:	1.180		2	1290
	0		Avg Crit Del (sec/veh):	46.4		0	
196	1		Avg Delay (sec/veh):	33.9		1	499***
			LOS:	C			

Lanes: 0 0 0 0 1
Initial Vol: 0 0 1900
Signal=Protect/Rights=Ignore

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	4	0	25	0	4	25	0
Volume Module:												
Base Vol:	0	0	1900	0	0	575	0	1965	196	499	1290	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	1900	0	0	575	0	1965	196	499	1290	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	1900	0	0	575	0	1965	196	499	1290	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	575	0	1965	0	499	1290	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	575	0	1965	0	499	1290	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	0	575	0	1965	0	499	1290	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	0	0	1900	0	0	2842	0	3610	1900	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.54	0.00	0.28	0.36	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.00	1.19	0.00	0.72	0.00	1.15	0.51	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	129.5	0.0	4.7	0.0	114.6	4.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	129.5	0.0	4.7	0.0	114.6	4.4	0.0
HCM2kAvg:	0	0	0	0	0	14	0	11	0	22	6	0
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0	0 0	1	0 0	0 0	2	0 0	2 0	1	1 0	2 0	0
Lane Group:	xxxx	xxxx	R	xxxx	xxxx	R	xxxx	T	R	L	T	xxxx
#LnsInGrps:	0	0	1	0	0	2	0	2	1	1	2	0
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Hev Veh Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Grade Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	xxxx	xxxxx	xxxx	1.00	xxxxx
Area Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	1.00	1.00	xxxxx
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
LT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.95	1.00	1.00
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Fnl Sat Adj:	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.95	1.00	0.95	0.95	1.00
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Actuated > > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #2 Alta Valley & Mack

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.76	0.00	0.24	0.70	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	0.0	0.0	4.8	0.0	8.6	0.0	8.8	5.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00
Q2:	0.0	0.0	0.0	0.0	0.0	9.5	0.0	2.4	0.0	13.5	1.0	0.0
HCM2KQueue:	0.0	0.0	0.0	0.0	0.0	14.3	0.0	11.0	0.0	22.3	6.0	0.0
70th%Factor:	1.20	1.20	1.20	1.20	1.20	1.17	1.20	1.18	1.20	1.16	1.19	1.20
70th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	16.7	0.0	13.0	0.0	25.8	7.2	0.0
85th%Factor:	1.60	1.60	1.60	1.60	1.60	1.49	1.60	1.51	1.60	1.44	1.55	1.60
85th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	21.3	0.0	16.6	0.0	32.1	9.3	0.0
90th%Factor:	1.80	1.80	1.80	1.80	1.80	1.60	1.80	1.63	1.80	1.53	1.70	1.80
90th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	22.8	0.0	18.0	0.0	34.1	10.3	0.0
95th%Factor:	2.10	2.10	2.10	2.10	2.10	1.77	2.10	1.83	2.10	1.67	1.93	2.10
95th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	25.3	0.0	20.1	0.0	37.3	11.7	0.0
98th%Factor:	2.70	2.70	2.70	2.70	2.70	2.03	2.70	2.13	2.70	1.88	2.33	2.70
98th%HCM2kQ:	0.0	0.0	0.0	0.0	0.0	29.1	0.0	23.5	0.0	41.9	14.1	0.0

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project PM

Intersection #3: Valley Hi & Bruceville

Signal=Protect/Rights=Include
Initial Vol: 80 723 190***
Lanes: 1 0 2 0 1

Initial Vol:	Lanes:	Signal=Split Rights=Include			Signal=Split Rights=Include	Lanes:	Initial Vol:
60	1		Vol Cnt Date:	n/a		2	481***
			Cycle Time (sec):	90			
	0		Loss Time (sec):	16		0	
30***	1!		Critical V/C:	0.551		0	80
	0		Avg Crit Del (sec/veh):	30.7		1	
15	0		Avg Delay (sec/veh):	27.3		1	250
			LOS:	C			

Lanes: 1 0 2 0 1
Initial Vol: 20 494*** 90
Signal=Protect/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	4	4	0	6	6	0	0	4	0	0	4	0
Volume Module:												
Base Vol:	20	494	90	190	723	80	60	30	15	250	80	481
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	494	90	190	723	80	60	30	15	250	80	481
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	20	494	90	190	723	80	60	30	15	250	80	481
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	20	494	90	190	723	80	60	30	15	250	80	481
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	20	494	90	190	723	80	60	30	15	250	80	481
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	20	494	90	190	723	80	60	30	15	250	80	481
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.95	0.96	0.96	0.75
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.40	0.40	0.20	1.52	0.48	2.00
Final Sat.:	1805	3610	1615	1805	3610	1615	2531	723	362	2772	887	2842
Capacity Analysis Module:												
Vol/Sat:	0.01	0.14	0.06	0.11	0.20	0.05	0.02	0.04	0.04	0.09	0.09	0.17
Crit Moves:		****		****				****				****
Green/Cycle:	0.08	0.25	0.25	0.19	0.36	0.36	0.08	0.08	0.08	0.31	0.31	0.31
Volume/Cap:	0.14	0.55	0.22	0.55	0.56	0.14	0.31	0.55	0.55	0.29	0.29	0.55
Delay/Veh:	39.0	30.2	27.2	34.8	23.6	19.5	40.0	43.6	43.6	23.9	23.9	26.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.0	30.2	27.2	34.8	23.6	19.5	40.0	43.6	43.6	23.9	23.9	26.8
HCM2kAvg:	1	7	2	6	8	2	1	3	3	4	4	6
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	1 0 2 0 1			1 0 2 0 1			1 0 1! 0 0			1 1 0 0 2		
Lane Group:	L	T	R	L	T	R	LTR	LTR	LTR	LT	LT	R
#LnsInGrps:	1	2	1	1	2	1	2	1	1	2	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	1	xxxx	xxxx	1	xxxx	xxxx	4	4	4	4	4	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	xxxx	xxxx	1.00	xxxx	xxxx	1.00	1.00	1.00	1.00	xxxx	xxxx	1.00
Bus Stp Adj:	xxxx	xxxx	1.00	xxxx	xxxx	1.00	1.00	1.00	1.00	xxxx	xxxx	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	xxxx	xxxx	0.85	xxxx	xxxx	0.85	0.98	0.98	0.98	xxxx	xxxx	0.85
LT Adj:	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	0.97	0.97	0.97	0.96	0.96	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.95	0.95	0.96	0.96	0.85
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Fnl Sat Adj:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.95	0.96	0.96	0.75
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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```
********************************************************************************
Intersection #3 Valley Hi & Bruceville
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Green/Cycle: 0.08 0.25  0.25  0.19 0.36  0.36  0.08 0.08  0.08  0.31 0.31  0.31
ArrivalType:         3                3                3                3
ProgFactor:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Q1:           0.5  5.4   1.8   4.5  7.2   1.3   1.0  1.9   1.9   3.3  3.3   5.0
UpstreamVC:  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00
UpstreamAdj: 0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00
EarlyArrAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Q2:           0.2  1.2   0.3   1.2  1.2   0.2   0.4  1.1   1.1   0.4  0.4   1.2
HCM2KQueue:   0.6  6.5   2.1   5.7  8.4   1.5   1.5  2.9   2.9   3.7  3.7   6.2
------------|----------------||----------------||----------------||----------------|
70th%Factor: 1.20 1.18  1.19  1.19 1.18  1.20  1.20 1.19  1.19  1.19 1.19  1.19
70th%HCM2kQ:  0.8  7.8   2.5   6.7 10.0   1.8   1.8  3.5   3.5   4.4  4.4   7.3
------------|----------------||----------------||----------------||----------------|
85th%Factor: 1.59 1.54  1.58  1.55 1.53  1.59  1.59 1.57  1.57  1.57 1.57  1.54
85th%HCM2kQ:  1.0 10.1   3.3   8.8 12.9   2.4   2.4  4.6   4.6   5.8  5.8   9.5
------------|----------------||----------------||----------------||----------------|
90th%Factor: 1.79 1.69  1.76  1.70 1.66  1.77  1.77 1.75  1.75  1.73 1.73  1.69
90th%HCM2kQ:  1.2 11.1   3.7   9.7 14.0   2.7   2.6  5.1   5.1   6.4  6.4  10.5
------------|----------------||----------------||----------------||----------------|
95th%Factor: 2.08 1.92  2.03  1.94 1.88  2.05  2.05 2.01  2.01  1.99 1.99  1.93
95th%HCM2kQ:  1.3 12.6   4.2  11.0 15.8   3.1   3.1  5.9   5.9   7.3  7.3  11.9
------------|----------------||----------------||----------------||----------------|
98th%Factor: 2.65 2.30  2.55  2.35 2.22  2.59  2.59 2.50  2.50  2.45 2.45  2.32
98th%HCM2kQ:  1.7 15.1   5.3  13.3 18.8   3.9   3.9  7.3   7.3   9.0  9.0  14.4
```

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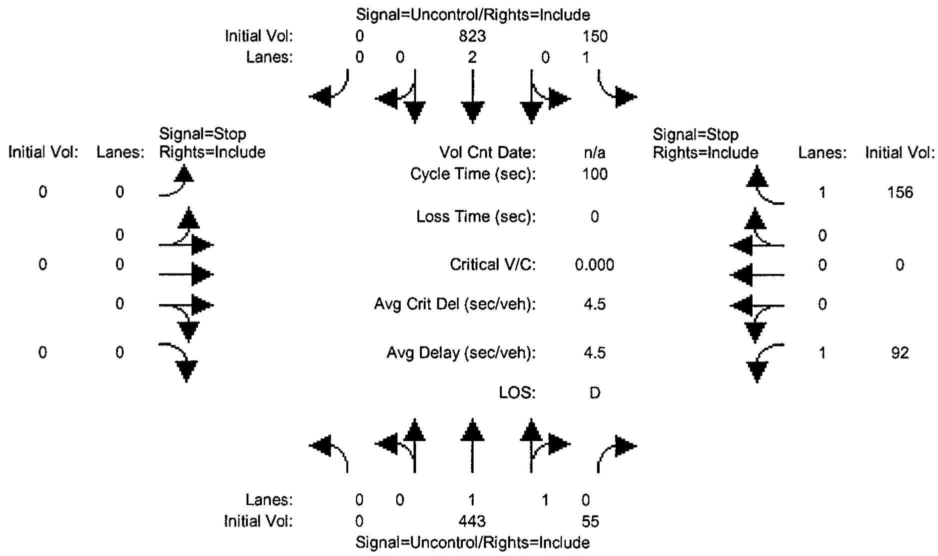
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 + Project PM

Intersection #4: Valley Hi & Wyndham




```
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  443    55   150  823     0     0    0     0    92    0   156
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  443    55   150  823     0     0    0     0    92    0   156
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0  443    55   150  823     0     0    0     0    92    0   156
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  443    55   150  823     0     0    0     0    92    0   156
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    0  443    55   150  823     0     0    0     0    92    0   156
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   498 xxxx xxxxx  xxxx xxxx xxxxx  1182 xxxx   249
Potent Cap.: xxxx xxxx xxxxx  1076 xxxx xxxxx  xxxx xxxx xxxxx   186 xxxx   757
Move Cap.:   xxxx xxxx xxxxx  1076 xxxx xxxxx  xxxx xxxx xxxxx   166 xxxx   757
Volume/Cap:  xxxx xxxx  xxxx  0.14 xxxx  xxxx  xxxx xxxx  xxxx  0.56 xxxx  0.21
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.5 xxxx xxxxx xxxxx xxxx xxxxx   2.9 xxxx   0.8
Stopped Del:xxxxx xxxx xxxxx   8.9 xxxx xxxxx xxxxx xxxx xxxxx  50.9 xxxx  11.0
LOS by Move:   *     *     *     A    *     *     *    *     *     F    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *     *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             25.8
ApproachLOS:        *                *                *                 D
-----------|----------------|----------------|----------------|----------------|
HevVeh:             0%               0%               0%               0%
Grade:              0%               0%               0%               0%
Peds/Hour:          0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:                          #5
Dist(miles):                         0.000
Speed (mph):                          0.00
SignalIndex:                         #3
Cycle Time:                              0 secs
InitVolume:                      0       0
Saturation:                      0       0
ArrivalType:                     0       0
G/C:                          0.00    0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:                           0.000 0.000
gq1:                          0.00  0.00
gq2:                          0.00  0.00
gq:                           0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:                               0.000
beta:                                0.000
ta (secs):                           0.000
F:                                   0.000
f:                           0.000 0.000
vcmax:                           0       0
vcg:                             0       0
vcmin:                           0       0
tp:                            0.0     0.0
p:                                   0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:      0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol:   0 xxxxx xxxxx  498 xxxxx xxxxx    0     0     0 1182     0   249
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol:   0 xxxxx xxxxx  498 xxxxx xxxxx    0     0     0 1182     0   249
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  900 xxxxx xxxxx 1076 xxxxx xxxxx  900   900   900  186   900   757
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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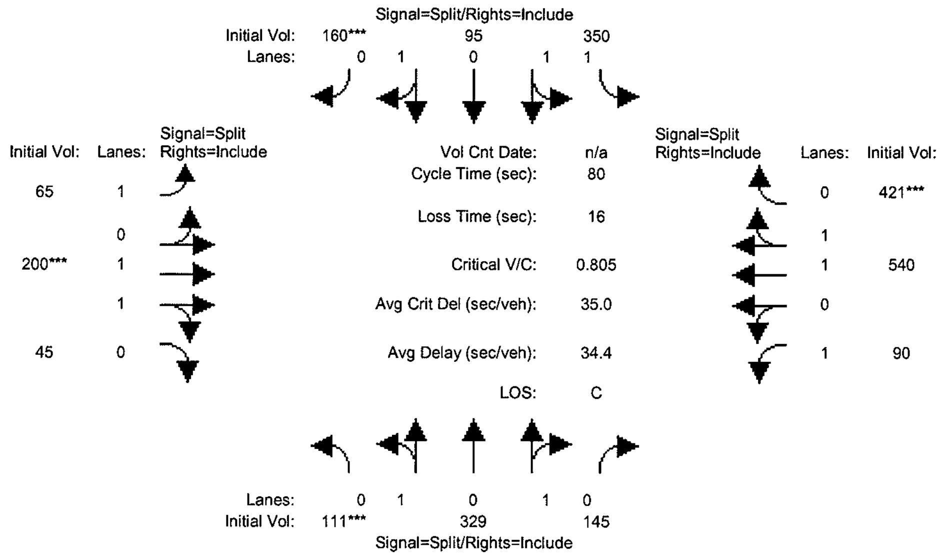
```
PotentCap:    900 xxxxx xxxxx 1076 xxxxx xxxxx  900   900   900  186   900   757
                      Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #4 Valley Hi & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  443    55   150  823     0     0     0     0    92     0   156
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            25.8
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=1.8]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=248]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1719]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #4 Valley Hi & Wyndham
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    1  0  0  0  1
Final Vol.:     0  443    55   150  823     0     0     0     0    92     0   156
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            1471
Minor Approach Volume:           248
Minor Approach Volume Threshold: 208
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project PM

Intersection #5: Alta Valley & Bruceville



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	6	0	0	6	0	4	6	0	4	6	0
Volume Module:												
Base Vol:	111	329	145	350	95	160	65	200	45	90	540	421
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	329	145	350	95	160	65	200	45	90	540	421
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	329	145	350	95	160	65	200	45	90	540	421
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	111	329	145	350	95	160	65	200	45	90	540	421
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	329	145	350	95	160	65	200	45	90	540	421
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	111	329	145	350	95	160	65	200	45	90	540	421
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.91	0.91	0.89	0.89	0.89	0.95	0.92	0.92	0.95	0.89	0.89
Lanes:	0.38	1.12	0.50	1.74	0.47	0.79	1.00	1.63	0.37	1.00	1.12	0.88
Final Sat.:	654	1938	854	2923	793	1336	1805	2864	644	1805	1895	1477
Capacity Analysis Module:												
Vol/Sat:	0.17	0.17	0.17	0.12	0.12	0.12	0.04	0.07	0.07	0.05	0.29	0.29
Crit Moves:	****					****		****				****
Green/Cycle:	0.21	0.21	0.21	0.15	0.15	0.15	0.09	0.09	0.09	0.35	0.35	0.35
Volume/Cap:	0.81	0.81	0.81	0.81	0.81	0.81	0.42	0.81	0.81	0.14	0.81	0.81
Delay/Veh:	36.6	36.6	36.6	39.3	39.3	39.3	36.4	50.4	50.4	17.7	27.5	27.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.6	36.6	36.6	39.3	39.3	39.3	36.4	50.4	50.4	17.7	27.5	27.5
HCM2kAvg:	9	9	9	7	7	7	2	5	5	2	13	13

HCM Ops Adjusted Lane Utilization Module:

	North Bound					South Bound					East Bound					West Bound				
Lanes:	0	1	0	1	0	1	1	0	1	0	1	0	1	1	0	1	0	1	1	0

	L	T	R	L	T	R	L	T	R	L	T	R
Lane Group:	LTR	LTR	LTR	LTR	LTR	LTR	L	RT	RT	L	RT	RT
#LnsInGrps:	2	2	2	3	3	3	1	2	2	1	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	4	4	4	4	4	4	1	xxxx	xxxx	1	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hev Veh Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grade Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Bus Stp Adj:	1.00	1.00	1.00	1.00	1.00	1.00	xxxx	1.00	1.00	xxxx	1.00	1.00
Area Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RT Adj:	0.96	0.96	0.96	0.96	0.96	0.96	xxxx	0.97	0.97	xxxx	0.93	0.93
LT Adj:	0.99	0.99	0.99	0.97	0.97	0.97	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.97	0.97	0.95	0.93	0.93
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Fnl Sat Adj:	0.91	0.91	0.91	0.89	0.89	0.89	0.95	0.92	0.92	0.95	0.89	0.89
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < Actuated > > > > > > > > > > > > > > >											
DelAdjFctr:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #5 Alta Valley & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.21	0.21	0.21	0.15	0.15	0.15	0.09	0.09	0.09	0.35	0.35	0.35
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	6.2	6.2	6.2	4.5	4.5	4.5	1.4	2.7	2.7	1.4	9.6	9.6
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	3.1	3.1	3.1	2.8	2.8	2.8	0.7	2.5	2.5	0.2	3.4	3.4
HCM2KQueue:	9.3	9.3	9.3	7.3	7.3	7.3	2.1	5.2	5.2	1.6	13.0	13.0
70th%Factor:	1.18	1.18	1.18	1.18	1.18	1.18	1.19	1.19	1.19	1.20	1.17	1.17
70th%HCM2kQ:	11.0	11.0	11.0	8.6	8.6	8.6	2.5	6.1	6.1	1.9	15.3	15.3
85th%Factor:	1.52	1.52	1.52	1.54	1.54	1.54	1.58	1.55	1.55	1.58	1.49	1.49
85th%HCM2kQ:	14.2	14.2	14.2	11.2	11.2	11.2	3.3	8.0	8.0	2.5	19.4	19.4
90th%Factor:	1.65	1.65	1.65	1.68	1.68	1.68	1.76	1.71	1.71	1.77	1.61	1.61
90th%HCM2kQ:	15.4	15.4	15.4	12.3	12.3	12.3	3.7	8.8	8.8	2.8	20.9	20.9
95th%Factor:	1.86	1.86	1.86	1.90	1.90	1.90	2.03	1.95	1.95	2.05	1.79	1.79
95th%HCM2kQ:	17.3	17.3	17.3	13.9	13.9	13.9	4.3	10.0	10.0	3.3	23.3	23.3
98th%Factor:	2.19	2.19	2.19	2.27	2.27	2.27	2.55	2.37	2.37	2.58	2.07	2.07
98th%HCM2kQ:	20.4	20.4	20.4	16.6	16.6	16.6	5.4	12.2	12.2	4.1	26.9	26.9

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Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project PM

Intersection #6: SR 99 SB Ramps & Bruceville

Signal=Split/Rights=Overlap
Initial Vol: 284 0 246***
Lanes: 1 0 0 0 1

Signal=Protect Rights=Include (Eastbound)
Initial Vol: 345*** Lanes: 1
Lanes: 0
Initial Vol: 350 Lanes: 2
Lanes: 0
Initial Vol: 0 Lanes: 0

Vol Cnt Date: n/a
Cycle Time (sec): 90
Loss Time (sec): 14
Critical V/C: 0.674
Avg Crit Del (sec/veh): 29.4
Avg Delay (sec/veh): 22.9
LOS: C

Signal=Protect Rights=Overlap (Westbound)
Lanes: 0 Initial Vol: 92
Lanes: 1
Lanes: 1 Initial Vol: 767***
Lanes: 0
Lanes: 0 Initial Vol: 0

Lanes: 0 0 0 0 0
Initial Vol: 0 0 0
Signal=Split/Rights=Include

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	4	0	0	4	6	0	0	6	0
Volume Module:												
Base Vol:	0	0	0	246	0	284	345	350	0	0	767	92
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	246	0	284	345	350	0	0	767	92
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	246	0	284	345	350	0	0	767	92
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	246	0	284	345	350	0	0	767	92
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	246	0	284	345	350	0	0	767	92
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	246	0	284	345	350	0	0	767	92
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.93	0.93
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.79	0.21
Final Sat.:	0	0	0	1805	0	1615	1805	3610	0	0	3172	380
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.14	0.00	0.18	0.19	0.10	0.00	0.00	0.24	0.24
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.20	0.00	0.49	0.28	0.64	0.00	0.00	0.36	0.56
Volume/Cap:	0.00	0.00	0.00	0.67	0.00	0.36	0.67	0.15	0.00	0.00	0.67	0.43
Delay/Veh:	0.0	0.0	0.0	38.1	0.0	14.7	32.1	6.4	0.0	0.0	25.9	11.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	38.1	0.0	14.7	32.1	6.4	0.0	0.0	25.9	11.6
HCM2kAvg:	0	0	0	8	0	5	10	2	0	0	11	7
HCM Ops Adjusted Lane Utilization Module:												
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Lane Group:	xxxx	xxxx	xxxx	L	xxxx	R	L	T	xxxx	xxxx	RT	RT
#LnsInGrps:	0	0	0	1	0	1	1	2	0	0	2	2
HCM Ops Input Saturation Adj Module:												
Lane Width:	12	12	12	12	12	12	12	12	12	12	12	12
CrosswalkWid		8			8			8			8	
% Hev Veh:		0			0			0			0	
Grade:		0%			0%			0%			0%	
Parking/Hr:		No			No			No			No	
Bus Stp/Hr:		0			0			0			0	
Area Type:	< < < < < < < < < < < < < < Other > > > > > > > > > > > > > >											
Cnft Ped/Hr:		0			0			0			0	
ExclusiveRT:		Include			Include			Include			Include	
% RT Prtct:		0			0			0			0	
HCM Ops f(lt) Adj Case Module:												
f(lt) Case:	xxxx	xxxx	xxxx	1	xxxx	xxxx	1	xxxx	xxxx	xxxx	xxxx	xxxx
HCM Ops Saturation Adj Module:												
Ln Wid Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Hev Veh Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Grade Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
Parking Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Bus Stp Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.00	xxxx	1.00	xxxxx	xxxx	1.00	1.00
Area Adj:	xxxx	xxxx	xxxxx	1.00	xxxx	1.00	1.00	1.00	xxxxx	xxxx	1.00	1.00
RT Adj:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.85	xxxx	xxxx	xxxxx	xxxx	0.98	0.98
LT Adj:	xxxx	xxxx	xxxxx	0.95	xxxx	xxxxx	0.95	xxxx	xxxxx	xxxx	xxxx	xxxxx
PedBike Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
HCM Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	1.00	1.00	1.00	0.98	0.98
Usr Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Sat Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Fnl Sat Adj:	1.00	1.00	1.00	0.95	1.00	0.85	0.95	0.95	1.00	1.00	0.93	0.93
Delay Adjustment Factor Module:												
Coordinated:	< < < < < < < < < < < < < < No > > > > > > > > > > > > > > > >											
Signal Type:	< < < < < < < < < < < < < Actuated > > > > > > > > > > > > >											
DelAdjFctr:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)
2000 HCM Operations Method
Future Volume Alternative

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Intersection #6 SR 99 SB Ramps & Bruceville

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.00	0.00	0.00	0.20	0.00	0.49	0.28	0.64	0.00	0.00	0.36	0.56
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	0.0	0.0	0.0	6.0	0.0	4.4	8.0	1.7	0.0	0.0	9.1	6.2
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Q2:	0.0	0.0	0.0	1.8	0.0	0.6	1.9	0.2	0.0	0.0	1.9	0.7
HCM2KQueue:	0.0	0.0	0.0	7.8	0.0	5.0	9.9	1.9	0.0	0.0	11.0	7.0
70th%Factor:	1.20	1.20	1.20	1.18	1.20	1.19	1.18	1.20	1.20	1.20	1.18	1.18
70th%HCM2kQ:	0.0	0.0	0.0	9.3	0.0	5.9	11.7	2.3	0.0	0.0	12.9	8.3
85th%Factor:	1.60	1.60	1.60	1.53	1.60	1.55	1.52	1.58	1.60	1.60	1.51	1.54
85th%HCM2kQ:	0.0	0.0	0.0	12.0	0.0	7.8	15.1	3.0	0.0	0.0	16.6	10.7
90th%Factor:	1.80	1.80	1.80	1.67	1.80	1.71	1.64	1.76	1.80	1.80	1.63	1.68
90th%HCM2kQ:	0.0	0.0	0.0	13.1	0.0	8.5	16.3	3.4	0.0	0.0	17.9	11.7
95th%Factor:	2.10	2.10	2.10	1.89	2.10	1.95	1.85	2.04	2.10	2.10	1.83	1.91
95th%HCM2kQ:	0.0	0.0	0.0	14.8	0.0	9.8	18.4	3.9	0.0	0.0	20.1	13.3
98th%Factor:	2.70	2.70	2.70	2.25	2.70	2.38	2.17	2.56	2.70	2.70	2.13	2.29
98th%HCM2kQ:	0.0	0.0	0.0	17.6	0.0	11.9	21.5	4.9	0.0	0.0	23.4	15.9

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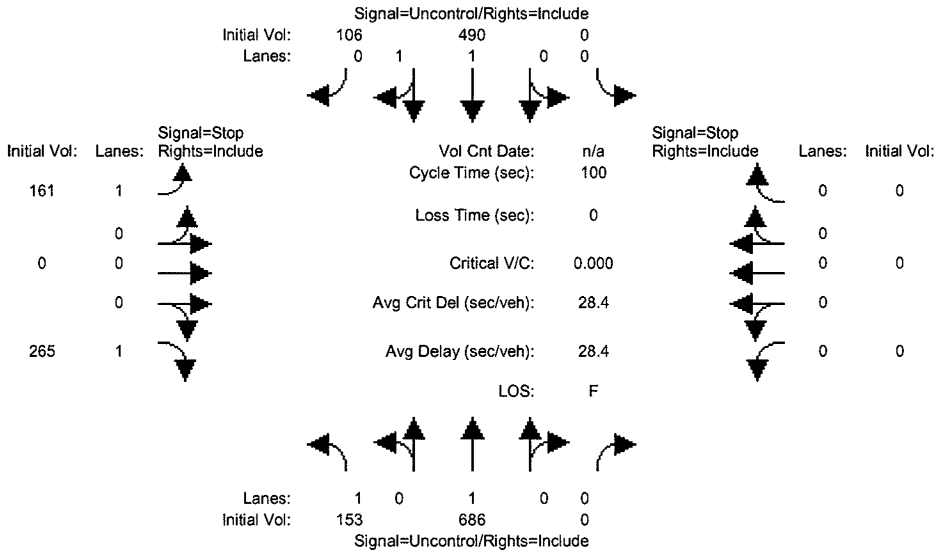
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 + Project PM

Intersection #7: Bruceville / Kaiser Access




```
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     153  686    0     0  490   106   161    0   265     0    0     0
Growth Adj:  1.00 1.00 1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  153  686    0     0  490   106   161    0   265     0    0     0
Added Vol:      0    0    0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0    0     0    0     0     0    0     0     0    0     0
Initial Fut:  153  686    0     0  490   106   161    0   265     0    0     0
User Adj:    1.00 1.00 1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   153  686    0     0  490   106   161    0   265     0    0     0
Reduct Vol:     0    0    0     0    0     0     0    0     0     0    0     0
Final Vol.:   153  686    0     0  490   106   161    0   265     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  596 xxxx xxxxx  xxxx xxxx xxxxx  1535 xxxx   298  xxxx xxxx xxxxx
Potent Cap.:  990 xxxx xxxxx  xxxx xxxx xxxxx   129 xxxx   746  xxxx xxxx xxxxx
Move Cap.:    990 xxxx xxxxx  xxxx xxxx xxxxx   114 xxxx   746  xxxx xxxx xxxxx
Volume/Cap:  0.15 xxxx  xxxx  xxxx xxxx  xxxx  1.41 xxxx  0.36  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.5 xxxx xxxxx xxxxx xxxx xxxxx  11.2 xxxx   1.6 xxxxx xxxx xxxxx
Stopped Del:  9.3 xxxx xxxxx xxxxx xxxx xxxxx 298.9 xxxx  12.5 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     F    *     B     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           120.7            xxxxxx
ApproachLOS:        *                *                F                *
-----------|----------------|----------------|----------------|----------------|
HevVeh:              0%               0%               0%               0%
Grade:               0%               0%               0%               0%
Peds/Hour:           0                0                0                0
Pedestrian Walk Speed: 4.00 feet/sec
LaneWidth:        12 feet          12 feet          12 feet          12 feet
Time Period: 0.25 hour
-----------|----------------|----------------|----------------|----------------|
Upstream Signals:
Link Index:       #120
Dist(miles):      0.000
Speed (mph):       0.00
SignalIndex:      #8
Cycle Time:           0 secs
InitVolume:      0      0
Saturation:      0      0
ArrivalType:     0      0
G/C:          0.00   0.00
*** Computation 1: Time for Queue to Clear at Each Upstream Intersection
P:           0.000 0.000
gq1:          0.00  0.00
gq2:          0.00  0.00
gq:           0.00  0.00
*** Computation 2: Time Intersection Blocked Because of Upstream Platoons
alpha:            0.000
beta:             0.000
ta (secs):        0.000
F:                0.000
f:           0.000 0.000
vcmax:           0      0
vcg:             0      0
vcmin:           0      0
tp:            0.0    0.0
p:                0.000
*** Computation 3: Platoon Event Periods
pdom/psubo:        0.000/0.000/Unconstrained
*** Computation 4: Conflicting Flows During Each Unblocked Period
InitCnflVol: 596 xxxxx xxxxx    0 xxxxx xxxxx 1535     0   298   0     0     0
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
ConflictVol: 596 xxxxx xxxxx    0 xxxxx xxxxx 1535     0   298   0     0     0
*** Computation 5: Capactiy for Subject Movement During Unblocked Period
InitPotCap:  990 xxxxx xxxxx  900 xxxxx xxxxx  129   900   746 900   900   900
UpstreamAdj:1.00 x.xxx x.xxx 1.00 x.xxx x.xxx 1.00 1.000 1.000 1.00 1.000 1.000
```

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```
PotentCap:   990 xxxxx xxxxx  900 xxxxx xxxxx  129   900   746  900   900   900
                         Peak Hour Delay Signal Warrant Report
**********************************************************************************
Intersection #7 Bruceville / Kaiser Access
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:         1  0  1  0  0     0  0  1  1  0     1  0  0  0  1     0  0  0  0  0
Final Vol.:    153  686    0       0  490  106     161    0  265       0    0    0
ApproachDel:      xxxxxx            xxxxxx             120.7            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=14.3]
   SUCCEED - Vehicle-hours >= 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=426]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1861]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
**********************************************************************************
Intersection #7 Bruceville / Kaiser Access
**********************************************************************************
Future Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled      Uncontrolled       Stop Sign         Stop Sign
Lanes:         1  0  1  0  0     0  0  1  1  0     1  0  0  0  1     0  0  0  0  0
Final Vol.:    153  686    0       0  490  106     161    0  265       0    0    0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            1435
Minor Approach Volume:          426
Minor Approach Volume Threshold: 219
```

Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
2025 + Project PM

Intersection #8: Bruceville & Wyndham

Signal=Protect/Rights=Include
Initial Vol: 225 530*** 0
Lanes: 0 1 1 0 0

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Include	Lanes:	Initial Vol:
120***	1		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	104			
	0		Loss Time (sec):	12		0	
0	0		Critical V/C:	0.414		0	0
	0		Avg Crit Del (sec/veh):	21.1		0	
191	1		Avg Delay (sec/veh):	16.0		0	0
			LOS:	B			

Lanes: 1 0 2 0 0
Initial Vol: 145*** 619 0
Signal=Protect/Rights=Include

```
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    5    6     0     0    6     0     4    0     5     0    0     0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    145  619     0     0  530   225   120    0   191     0    0     0
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 145  619     0     0  530   225   120    0   191     0    0     0
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut: 145  619     0     0  530   225   120    0   191     0    0     0
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  145  619     0     0  530   225   120    0   191     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 145  619     0     0  530   225   120    0   191     0    0     0
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  145  619     0     0  530   225   120    0   191     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.95 0.95  1.00  1.00 0.91  0.91  0.95 1.00  0.85  1.00 1.00  1.00
Lanes:      1.00 2.00  0.00  0.00 1.40  0.60  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.: 1805 3610     0     0 2420  1027  1805    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.08 0.17  0.00  0.00 0.22  0.22  0.07 0.00  0.12  0.00 0.00  0.00
Crit Moves: ****                  ****        ****
Green/Cycle: 0.19 0.72 0.00  0.00 0.53  0.53  0.16 0.00  0.36  0.00 0.00  0.00
Volume/Cap: 0.41 0.24  0.00  0.00 0.41  0.41  0.41 0.00  0.33  0.00 0.00  0.00
Delay/Veh:  37.5  4.8   0.0   0.0 14.9  14.9  40.2  0.0  24.9   0.0  0.0   0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 37.5  4.8   0.0   0.0 14.9  14.9  40.2  0.0  24.9   0.0  0.0   0.0
HCM2kAvg:      5    3     0     0    7     7     4    0     5     0    0     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Adjusted Lane Utilization Module:
Lanes:         1  0  2  0  0    0  0  1  1  0    1  0  0  0  1    0  0  0  0  0
Lane Group:    L    T  xxxx  xxxx  RT    RT     L xxxx     R  xxxx xxxx  xxxx
#LnsInGrps:    1    2     0     0    2     2     1    0     1     0    0     0
------------|---------------||---------------||---------------||---------------|
HCM Ops Input Saturation Adj Module:
Lane Width:   12   12    12    12   12    12    12   12    12    12   12    12
CrosswalkWid        8                8                8                8
% Hev Veh:          0                0                0                0
Grade:             0%               0%               0%               0%
Parking/Hr:        No               No               No               No
Bus Stp/Hr:         0                0                0                0
Area Type:    < < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
Cnft Ped/Hr:        0                0                0                0
ExclusiveRT:     Include          Include          Include          Include
% RT Prtct:         0                0                0                0
------------|---------------||---------------||---------------||---------------|
HCM Ops f(lt) Adj Case Module:
f(lt) Case:    1 xxxx  xxxx  xxxx xxxx  xxxx     1 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
HCM Ops Saturation Adj Module:
Ln Wid Adj:  1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Hev Veh Adj: 1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Grade Adj:   1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
Parking Adj: xxxx 1.00 xxxxx  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx xxxx xxxxx
Bus Stp Adj: xxxx 1.00 xxxxx  xxxx 1.00  1.00  xxxx xxxx  1.00  xxxx xxxx xxxxx
Area Adj:    1.00 1.00 xxxxx  xxxx 1.00  1.00  1.00 xxxx  1.00  xxxx xxxx xxxxx
RT Adj:      xxxx xxxx xxxxx  xxxx 0.96  0.96  xxxx xxxx  0.85  xxxx xxxx xxxxx
LT Adj:      0.95 xxxx xxxxx  xxxx xxxx xxxxx  0.95 xxxx xxxxx  xxxx xxxx xxxxx
PedBike Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HCM Sat Adj: 0.95 1.00  1.00  1.00 0.96  0.96  0.95 1.00  0.85  1.00 1.00  1.00
Usr Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Sat Adj: 1.00 0.95  1.00  1.00 0.95  0.95  1.00 1.00  1.00  1.00 1.00  1.00
Fnl Sat Adj: 0.95 0.95  1.00  1.00 0.91  0.91  0.95 1.00  0.85  1.00 1.00  1.00
------------|---------------||---------------||---------------||---------------|
Delay Adjustment Factor Module:
Coordinated:  < < < < < < < < < < < < < < < No   > > > > > > > > > > > > > > > >
Signal Type:  < < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
DelAdjFctr:  1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
      Level Of Service Detailed Computation Report (HCM2000 Queue Method)
                        2000 HCM Operations Method
                         Future Volume Alternative
```

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Intersection #8 Bruceville & Wyndham

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.19	0.72	0.00	0.00	0.53	0.53	0.16	0.00	0.36	0.00	0.00	0.00
ArrivalType:		3			3			3			3	
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	3.9	3.0	0.0	0.0	6.6	6.6	3.3	0.0	4.0	0.0	0.0	0.0
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Q2:	0.7	0.3	0.0	0.0	0.7	0.7	0.7	0.0	0.5	0.0	0.0	0.0
HCM2KQueue:	4.6	3.3	0.0	0.0	7.3	7.3	4.0	0.0	4.5	0.0	0.0	0.0
70th%Factor:	1.19	1.19	1.20	1.20	1.18	1.18	1.19	1.20	1.19	1.20	1.20	1.20
70th%HCM2kQ:	5.4	3.9	0.0	0.0	8.6	8.6	4.7	0.0	5.4	0.0	0.0	0.0
85th%Factor:	1.56	1.57	1.60	1.60	1.54	1.54	1.56	1.60	1.56	1.60	1.60	1.60
85th%HCM2kQ:	7.1	5.2	0.0	0.0	11.2	11.2	6.2	0.0	7.1	0.0	0.0	0.0
90th%Factor:	1.72	1.74	1.80	1.80	1.68	1.68	1.73	1.80	1.72	1.80	1.80	1.80
90th%HCM2kQ:	7.8	5.7	0.0	0.0	12.2	12.2	6.9	0.0	7.8	0.0	0.0	0.0
95th%Factor:	1.97	2.00	2.10	2.10	1.90	1.90	1.98	2.10	1.97	2.10	2.10	2.10
95th%HCM2kQ:	8.9	6.6	0.0	0.0	13.8	13.8	7.9	0.0	8.9	0.0	0.0	0.0
98th%Factor:	2.40	2.48	2.70	2.70	2.27	2.27	2.44	2.70	2.41	2.70	2.70	2.70
98th%HCM2kQ:	10.9	8.1	0.0	0.0	16.5	16.5	9.7	0.0	10.9	0.0	0.0	0.0

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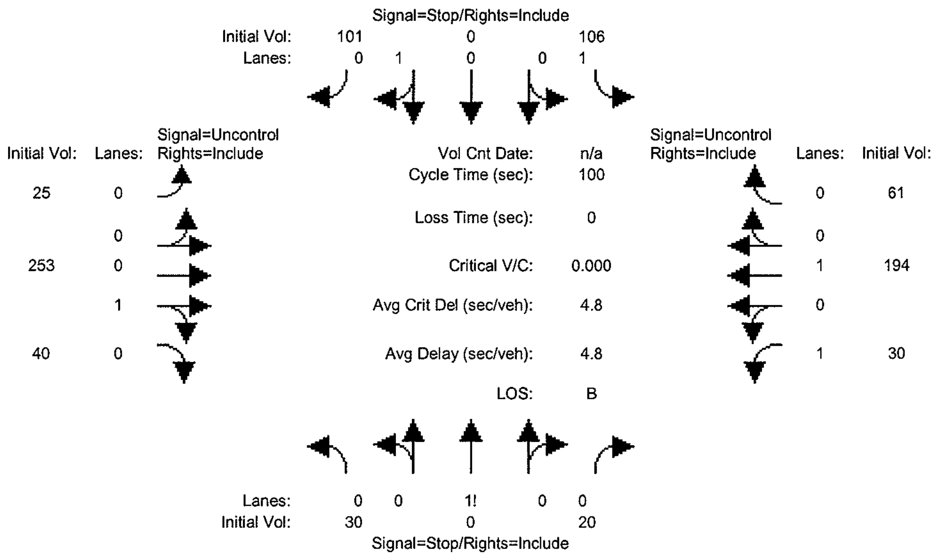
Kaiser South Expansion

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
2025 + Project PM

Intersection #9: Arroyo Vista & Wyndham



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	30	0	20	106	0	101	25	253	40	30	194	61
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	30	0	20	106	0	101	25	253	40	30	194	61
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	30	0	20	106	0	101	25	253	40	30	194	61
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	30	0	20	106	0	101	25	253	40	30	194	61
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	30	0	20	106	0	101	25	253	40	30	194	61
Critical Gap Module:												
Critical Gp:	7.1	xxxx	6.2	7.1	xxxx	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	3.5	xxxx	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	658	xxxx	273	618	xxxx	225	255	xxxx	xxxxx	293	xxxx	xxxxx
Potent Cap.:	380	xxxx	771	405	xxxx	820	1322	xxxx	xxxxx	1280	xxxx	xxxxx
Move Cap.:	323	xxxx	771	382	xxxx	820	1322	xxxx	xxxxx	1280	xxxx	xxxxx
Volume/Cap:	0.09	xxxx	0.03	0.28	xxxx	0.12	0.02	xxxx	xxxx	0.02	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	1.1	xxxx	xxxxx	0.1	xxxx	xxxxx	0.1	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	18.0	xxxx	xxxxx	7.8	xxxx	xxxxx	7.9	xxxx	xxxxx
LOS by Move:	*	*	*	C	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	421	xxxxx	xxxx	xxxx	820	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.4	xxxxx	xxxxx	xxxx	0.4	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	14.7	xxxxx	xxxxx	xxxx	10.0	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	B	*	*	*	B	*	*	*	*	*	*
ApproachDel:		14.7			14.1			xxxxxx			xxxxxx	
ApproachLOS:		B			B			*			*	

Peak Hour Delay Signal Warrant Report

****

Intersection #9 Arroyo Vista & Wyndham

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound	South Bound	East Bound	West Bound

```
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0    1  0  0  1  0
Final Vol.:    30    0    20   106    0   101    25  253    40    30  194    61
ApproachDel:       14.7             14.1            xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[northbound][lanes=1][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=50]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=860]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[southbound][lanes=2][control=Stop]
Signal Warrant Rule #1: [vehicle-hours=0.8]
   FAIL - Vehicle-hours less than 5 for two or more lane approach.
Signal Warrant Rule #2: [approach volume=207]
   SUCCEED - Approach volume >= 150 for two or more lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=860]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Arroyo Vista & Wyndham
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Lanes:        0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0    1  0  0  1  0
Final Vol.:    30    0    20   106    0   101    25  253    40    30  194    61
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            603
Minor Approach Volume:          207
Minor Approach Volume Threshold: 592
```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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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	0.94	0.91	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	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	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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
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	5085	1560	4990	5085	1560	3433	3539	2746	3433	3539	1561
Volume (vph)	165	980	750	2130	1400	380	420	439	1020	696	1103	82
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	165	980	750	2130	1400	380	420	439	1020	696	1103	82
RTOR Reduction (vph)	0	0	186	0	0	145	0	0	582	0	0	49
Lane Group Flow (vph)	165	980	564	2130	1400	235	420	439	438	696	1103	33
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	9.0	32.6	32.6	38.5	62.1	62.1	20.8	43.8	43.8	12.0	35.0	35.0
Effective Green, g (s)	8.5	33.3	33.3	38.0	62.8	62.8	19.8	44.5	44.5	11.0	35.7	35.7
Actuated g/C Ratio	0.06	0.23	0.23	0.27	0.44	0.44	0.14	0.31	0.31	0.08	0.25	0.25
Clearance Time (s)	3.5	4.7	4.7	3.5	4.7	4.7	3.0	4.7	4.7	3.0	4.7	4.7
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	204	1186	364	1328	2236	686	476	1103	856	264	885	390
v/s Ratio Prot	0.05	0.19		c0.43	0.28		c0.12	0.12		c0.20	c0.31	
v/s Ratio Perm			c0.36			0.15			0.16			0.02
v/c Ratio	0.81	0.83	1.55	1.60	0.63	0.34	0.88	0.40	0.51	2.64	1.25	0.09
Uniform Delay, d1	66.3	52.0	54.8	52.4	30.9	26.4	60.4	38.6	40.2	65.9	53.6	41.0
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	19.5	4.6	260.1	275.3	0.4	0.1	16.9	0.1	0.2	747.2	120.3	0.0
Delay (s)	85.8	56.6	314.8	327.7	31.3	26.5	77.2	38.7	40.5	813.1	173.9	41.1
Level of Service	F	E	F	F	C	C	E	D	D	F	F	D
Approach Delay (s)		161.4			192.3			48.3			404.6	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	199.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	142.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	127.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	2787				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	2787				3433		1583
Volume (vph)	0	2289	401	0	2790	900	0	0	0	1620	0	1210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2289	401	0	2790	900	0	0	0	1620	0	1210
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2289	401	0	2790	900	0	0	0	1620	0	1210
Turn Type			Free			Free				custom		custom
Protected Phases		6			2							
Permitted Phases			Free			Free				8		8
Actuated Green, G (s)		39.0	100.0		38.8	100.0				50.8		50.8
Effective Green, g (s)		40.0	100.0		40.0	100.0				52.0		52.0
Actuated g/C Ratio		0.40	1.00		0.40	1.00				0.52		0.52
Clearance Time (s)		5.0			5.2					5.2		5.2
Vehicle Extension (s)		1.0			1.0					1.0		1.0
Lane Grp Cap (vph)		2034	1583		2034	2787				1785		823
v/s Ratio Prot		0.45			c0.55							
v/s Ratio Perm			0.25			0.32				0.47		c0.76
v/c Ratio		1.13	0.25		1.37	0.32				0.91		1.47
Uniform Delay, d1		30.0	0.0		30.0	0.0				21.8		24.0
Progression Factor		1.00	1.00		1.03	1.00				1.00		1.00
Incremental Delay, d2		63.5	0.4		168.8	0.1				7.0		218.2
Delay (s)		93.5	0.4		199.6	0.1				28.8		242.2
Level of Service		F	A		F	A				C		F
Approach Delay (s)		79.6			150.9			0.0			120.0	
Approach LOS		E			F			A			F	

Intersection Summary			
HCM Average Control Delay	120.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	135.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑↑	↱↱	↰↰		↱↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	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		0.91	0.88	0.97		0.88			
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		1.00	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085	1550		5085	2787	3433		2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085	1550		5085	2787	3433		2787			
Volume (vph)	0	3179	730	0	3207	720	483	0	540	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	3179	730	0	3207	720	483	0	540	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	3179	730	0	3207	720	483	0	538	0	0	0
Confl. Peds. (#/hr)			2									
Turn Type			Free			Free	custom		custom			
Protected Phases		6			2							
Permitted Phases			Free			Free	4		4			
Actuated Green, G (s)		67.6	100.0		67.9	100.0	21.8		21.8			
Effective Green, g (s)		68.9	100.0		68.9	100.0	23.1		23.1			
Actuated g/C Ratio		0.69	1.00		0.69	1.00	0.23		0.23			
Clearance Time (s)		5.3			5.0		5.3		5.3			
Vehicle Extension (s)		1.0			1.0		1.0		1.0			
Lane Grp Cap (vph)		3504	1550		3504	2787	793		644			
v/s Ratio Prot		0.63			c0.63							
v/s Ratio Perm			0.47			0.26	0.14		c0.19			
v/c Ratio		0.91	0.47		0.92	0.26	0.61		0.84			
Uniform Delay, d1		12.9	0.0		13.1	0.0	34.4		36.6			
Progression Factor		0.61	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.4	0.1		4.9	0.2	0.9		8.8			
Delay (s)		8.3	0.1		18.0	0.2	35.3		45.5			
Level of Service		A	A		B	A	D		D			
Approach Delay (s)		6.8			14.7			40.7			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Kaiser South Expansion

Level Of Service Computation Report
Circular 212 Planning (Future Volume Alternative)
2025 + Project PM MITIGATED

Intersection #14: CALVINE RD/POWER INN RD

Signal=Protect/Rights=Overlap

Initial Vol:	800		1070***		450
Lanes:	1	0	2	0	2

Initial Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Overlap	Lanes:	Initial Vol:
660***	2		Vol Cnt Date:	n/a		1	390
			Cycle Time (sec):	100			
	0		Loss Time (sec):	16		0	
2239	3		Critical V/C:	1.544		3	2287***
	0		Avg Crit Del (sec/veh):	1035.0		0	
820	1		Avg Delay (sec/veh):	619.3		2	190
			LOS:	F			

Lanes:	2	0	2	0	1
Initial Vol:	840***		420		160

Signal=Protect/Rights=Overlap

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	840	420	160	450	1070	800	660	2239	820	190	2287	390
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	840	420	160	450	1070	800	660	2239	820	190	2287	390
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	840	420	160	450	1070	800	660	2239	820	190	2287	390
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	840	420	160	450	1070	800	660	2239	820	190	2287	390
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	840	420	160	450	1070	800	660	2239	820	190	2287	390
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.00	1.00
Final Vol.:	924	420	160	495	1070	800	726	2239	820	209	2287	390
Saturation Flow Module:												
Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	2750	4125	1375	2750	4125	1375
Capacity Analysis Module:												
Vol/Sat:	0.34	0.15	0.12	0.18	0.39	0.58	0.26	0.54	0.60	0.08	0.55	0.28
Crit Vol:	462				535		363				762	
Crit Moves:	****				****		****				****	

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Analyst: ehw
Agency or Company: Fehr & Peers
Date Performed: 8/26/2005
Analysis Time Period: AM
Freeway/Direction: NB SR 99
From/To: North of Mack
Jurisdiction:
Analysis Year: Existing
Description:

Flow Inputs and Adjustments

Volume, V	6690	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1673	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3412	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3412	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst: ehw
Agency or Company: Fehr & Peers
Date Performed: 8/26/2005
Analysis Time Period: PM
Freeway/Direction: NB SR 99
From/To: North of Mack
Jurisdiction:
Analysis Year: Existing
Description:

Flow Inputs and Adjustments

Volume, V	3585	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	897	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1828	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1828	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.7	mi/h
Number of lanes, N	2	
Density, D	28.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Existing
Description:	

Flow Inputs and Adjustments

Volume, V	5050	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1263	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi

Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2575	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

_____LOS and Performance Measures_____

Flow rate, vp	2575	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Existing
Description:	

_____Flow Inputs and Adjustments_____

Volume, V	2047	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	512	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1044	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft

Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1044	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	16.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Existing
Description:	

Flow Inputs and Adjustments

Volume, V	3457	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	865	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1763	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1763	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.2	mi/h
Number of lanes, N	2	
Density, D	27.5	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Existing
Description:	

Flow Inputs and Adjustments

Volume, V	6290	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1573	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3208	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3208	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Existing
Description:	

Flow Inputs and Adjustments

Volume, V	2652	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	663	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1353	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1353	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	20.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	South of Mack
Jurisdiction:	

Analysis Year: Existing
Description:

Flow Inputs and Adjustments

Volume, V	4790	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1198	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2443	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2443	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Flow Inputs and Adjustments

Volume, V	6791	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1698	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3463	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3463	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Flow Inputs and Adjustments

Volume, V	3765	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	942	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1920	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1920	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	2	
Density, D	30.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Flow Inputs and Adjustments

Volume, V	5125	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1282	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi

Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2614	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

_____LOS and Performance Measures_____

Flow rate, vp	2614	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

_____Flow Inputs and Adjustments_____

Volume, V	2166	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	542	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1105	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft

Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1105	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	17.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Flow Inputs and Adjustments

Volume, V	3541	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	886	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1806	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1806	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.9	mi/h
Number of lanes, N	2	
Density, D	28.3	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Flow Inputs and Adjustments

Volume, V	6495	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1624	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3312	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3312	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Flow Inputs and Adjustments

Volume, V	2719	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	680	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1387	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1387	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	21.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	South of Mack
Jurisdiction:	

Analysis Year: Baseline-NP
Description:

Flow Inputs and Adjustments

Volume, V	4945	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1237	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2522	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2522	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-PP
Description:	

Flow Inputs and Adjustments

Volume, V	6831	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1708	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3484	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3484	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-PP
Description:	

Flow Inputs and Adjustments

Volume, V	3766	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	942	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1921	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1921	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	2	
Density, D	30.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Baseline-PP
Description:	

Flow Inputs and Adjustments

Volume, V	5125	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1282	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	

Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2614	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

_____LOS and Performance Measures_____

Flow rate, vp	2614	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Baseline-PP
Description:	

_____Flow Inputs and Adjustments_____

Volume, V	2166	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	542	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1105	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	

FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1105	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	17.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-PP
Description:	

Flow Inputs and Adjustments

Volume, V	3615	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	904	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1844	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1844	pc/h/ln

Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.5	mi/h
Number of lanes, N	2	
Density, D	29.0	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Baseline-PP
Description:	

Flow Inputs and Adjustments

Volume, V	6545	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1637	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3338	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3338	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005

```
Analysis Time Period:     AM
Freeway/Direction:        SB SR 99
From/To:                  South of Mack
Jurisdiction:
Analysis Year:            Baseline-PP
Description:

_______________________Flow Inputs and Adjustments_______________________

Volume, V                                    2727          veh/h
Peak-hour factor, PHF                        1.00
Peak 15-min volume, v15                      682           v
Trucks and buses                             4             %
Recreational vehicles                        0             %
Terrain type:                                Level
    Grade                                    0.00          %
    Segment length                           0.00          mi
Trucks and buses PCE, ET                     1.5
Recreational vehicle PCE, ER                 1.2
Heavy vehicle adjustment, fHV                0.980
Driver population factor, fp                 1.00
Flow rate, vp                                1391          pc/h/ln

_______________________Speed Inputs and Adjustments______________________

Lane width                                   12.0          ft
Right-shoulder lateral clearance             6.0           ft
Interchange density                          0.50          interchange/mi
Number of lanes, N                           2
Free-flow speed:                             Measured
     FFS or BFFS                             65.0          mi/h
Lane width adjustment, fLW                   0.0           mi/h
Lateral clearance adjustment, fLC            0.0           mi/h
Interchange density adjustment, fID          0.0           mi/h
Number of lanes adjustment, fN               4.5           mi/h
Free-flow speed, FFS                         65.0          mi/h
                                             Urban Freeway

_______________________LOS and Performance Measures______________________

Flow rate, vp                                1391          pc/h/ln
Free-flow speed, FFS                         65.0          mi/h
Average passenger-car speed, S               65.0          mi/h
Number of lanes, N                           2
Density, D                                   21.4          pc/mi/ln
Level of service, LOS                        C

  Overall results are not computed when free-flow speed is less than 55 mph.

 Analyst:                   ehw
Agency or Company:         Fehr & Peers
Date Performed:            8/26/2005
Analysis Time Period:      PM
Freeway/Direction:         SB SR 99
From/To:                   South of Mack
Jurisdiction:
Analysis Year:             Baseline-PP
Description:

_______________________Flow Inputs and Adjustments_______________________

Volume, V                                    5007          veh/h
Peak-hour factor, PHF                        1.00
```

Peak 15-min volume, v15	1252	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2554	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2554	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

```
Analyst:                    ehw
Agency or Company:          Fehr & Peers
Date Performed:             8/26/2005
Analysis Time Period:       AM
Freeway/Direction:          NB SR 99
From/To:                    North of Mack
Jurisdiction:
Analysis Year:              Cum-NP
Description:

________________________Flow Inputs and Adjustments_________________________

Volume, V                                        8250          veh/h
Peak-hour factor, PHF                            1.00
Peak 15-min volume, v15                          2063          v
Trucks and buses                                 4             %
Recreational vehicles                            0             %
Terrain type:                                    Level
    Grade                                        0.00          %
    Segment length                               0.00          mi
Trucks and buses PCE, ET                         1.5
Recreational vehicle PCE, ER                     1.2
Heavy vehicle adjustment, fHV                    0.980
Driver population factor, fp                     1.00
Flow rate, vp                                    4207          pc/h/ln

________________________Speed Inputs and Adjustments________________________

Lane width                                       12.0          ft
Right-shoulder lateral clearance                 6.0           ft
Interchange density                              0.50          interchange/mi
Number of lanes, N                               2
Free-flow speed:                                 Measured
     FFS or BFFS                                 65.0          mi/h
Lane width adjustment, fLW                       0.0           mi/h
Lateral clearance adjustment, fLC                0.0           mi/h
Interchange density adjustment, fID              0.0           mi/h
Number of lanes adjustment, fN                   4.5           mi/h
Free-flow speed, FFS                             65.0          mi/h
                                                 Urban Freeway

________________________LOS and Performance Measures________________________

Flow rate, vp                                    4207          pc/h/ln
Free-flow speed, FFS                             65.0          mi/h
Average passenger-car speed, S                                 mi/h
Number of lanes, N                               2
Density, D                                                     pc/mi/ln
Level of service, LOS                            F

  Overall results are not computed when free-flow speed is less than 55 mph.
 Analyst:                    ehw
Agency or Company:          Fehr & Peers
Date Performed:             8/26/2005
Analysis Time Period:       PM
Freeway/Direction:          NB SR 99
From/To:                    North of Mack
Jurisdiction:
Analysis Year:              Cum-NP
Description:

________________________Flow Inputs and Adjustments_________________________
```

Volume, V	4267	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1067	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2176	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2176	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.7	mi/h
Number of lanes, N	2	
Density, D	37.7	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Cum-NP
Description:	

Flow Inputs and Adjustments

Volume, V	5950	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1488	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	

Driver population factor, fp	1.00	
Flow rate, vp	3034	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

_____LOS and Performance Measures_____

Flow rate, vp	3034	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Cum-NP
Description:	

_____Flow Inputs and Adjustments_____

Volume, V	2242	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	561	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1143	pc/h/ln

_____Speed Inputs and Adjustments_____

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h

Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1143	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	17.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Cum-NP
Description:	

Flow Inputs and Adjustments

Volume, V	4116	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1029	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2099	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2099	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	59.5	mi/h

Number of lanes, N	2	
Density, D	35.3	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Cum-NP
Description:	

Flow Inputs and Adjustments

Volume, V	7770	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1943	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3963	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3963	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	South of Mack

```
Jurisdiction:
Analysis Year:          Cum-NP
Description:

___________________________Flow Inputs and Adjustments___________________________

Volume, V                                     3267          veh/h
Peak-hour factor, PHF                         1.00
Peak 15-min volume, v15                       817           v
Trucks and buses                              4             %
Recreational vehicles                         0             %
Terrain type:                                 Level
    Grade                                     0.00          %
    Segment length                            0.00          mi
Trucks and buses PCE, ET                      1.5
Recreational vehicle PCE, ER                  1.2
Heavy vehicle adjustment, fHV                 0.980
Driver population factor, fp                  1.00
Flow rate, vp                                 1666          pc/h/ln

___________________________Speed Inputs and Adjustments___________________________

Lane width                                    12.0          ft
Right-shoulder lateral clearance              6.0           ft
Interchange density                           0.50          interchange/mi
Number of lanes, N                            2
Free-flow speed:                              Measured
     FFS or BFFS                              65.0          mi/h
Lane width adjustment, fLW                    0.0           mi/h
Lateral clearance adjustment, fLC             0.0           mi/h
Interchange density adjustment, fID           0.0           mi/h
Number of lanes adjustment, fN                4.5           mi/h
Free-flow speed, FFS                          65.0          mi/h
                                              Urban Freeway

___________________________LOS and Performance Measures___________________________

Flow rate, vp                                 1666          pc/h/ln
Free-flow speed, FFS                          65.0          mi/h
Average passenger-car speed, S                64.7          mi/h
Number of lanes, N                            2
Density, D                                    25.8          pc/mi/ln
Level of service, LOS                         C

  Overall results are not computed when free-flow speed is less than 55 mph.

  Analyst:              ehw
Agency or Company:      Fehr & Peers
Date Performed:         8/26/2005
Analysis Time Period:   PM
Freeway/Direction:      SB SR 99
From/To:                South of Mack
Jurisdiction:
Analysis Year:          Cum-NP
Description:

___________________________Flow Inputs and Adjustments___________________________

Volume, V                                     6040          veh/h
Peak-hour factor, PHF                         1.00
Peak 15-min volume, v15                       1510          v
Trucks and buses                              4             %
Recreational vehicles                         0             %
```

Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3080	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3080	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	8290	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	2073	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	4228	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	4228	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	4356	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1089	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2222	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2222	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	56.4	mi/h
Number of lanes, N	2	
Density, D	39.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	5950	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1488	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	

Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3034	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3034	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	NB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	2242	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	561	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1143	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	

Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1143	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	17.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	North of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	4191	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1048	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2137	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2137	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	58.7	mi/h
Number of lanes, N	2	
Density, D	36.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst: ehw
Agency or Company: Fehr & Peers
Date Performed: 8/26/2005
Analysis Time Period: PM
Freeway/Direction: SB SR 99
From/To: North of Mack
Jurisdiction:
Analysis Year: Cum-PP
Description:

Flow Inputs and Adjustments

Volume, V	6990	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1748	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	3565	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	3565	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst: ehw
Agency or Company: Fehr & Peers

Date Performed:	8/26/2005
Analysis Time Period:	AM
Freeway/Direction:	SB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	3273	veh/h
Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	819	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	1669	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1669	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.7	mi/h
Number of lanes, N	2	
Density, D	25.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ehw
Agency or Company:	Fehr & Peers
Date Performed:	8/26/2005
Analysis Time Period:	PM
Freeway/Direction:	SB SR 99
From/To:	South of Mack
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Flow Inputs and Adjustments

Volume, V	5676	veh/h

Peak-hour factor, PHF	1.00	
Peak 15-min volume, v15	1419	v
Trucks and buses	4	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.980	
Driver population factor, fp	1.00	
Flow rate, vp	2895	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2895	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	NB Mack E
Jurisdiction:	
Analysis Year:	Existing
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5050	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1055	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5050		1055			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1263		264			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	5151		1076			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$V_{12} = V_F (P_{FM})$ = 5151 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}	6227	4700	Yes
V_{R12}	6227	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 52.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S =	2.281	
Space mean speed in ramp influence area,	S_R =	12.5	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =	12.5	mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	NB Mack W
Jurisdiction:	
Analysis Year:	Existing
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6105	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	585	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6105		585			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15						v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	6227		597			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6227 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6824	4700	Yes
v_{R12}	6824	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 57.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 3.894	
Space mean speed in ramp influence area,	S_R = -24.6	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S =	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3456	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	342	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent

			Ramp	
Volume, V (vph)	3456	342		vph
Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	864	86		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.980	0.980		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	3525	349		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3525 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3874	4700	No
v_{R12}	3874	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 34.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M_S = 0.500

Space mean speed in ramp influence area, S_R = 53.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 53.5 mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	SB Off w/ split
Jurisdiction:	
Analysis Year:	Existing
Description:	

Freeway Data

Type of analysis	Merge
Number of lanes in freeway	2

Free-flow speed on freeway	65.0	mph
Volume on freeway	3201	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	879	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3201		879			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1131		220			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	3265		897			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3265 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4162	4700	No
v_{R12}	4162	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 37.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, M_S = 0.566

Space mean speed in ramp influence area, S_R = 52.0 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 52.0 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB On
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2542	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	149	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2542		149			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	636		38			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	2593		152			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2593 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2745	4700	No

v_{R12}	2745	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S =	0.368	
Space mean speed in ramp influence area,	S_R =	56.5	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =	56.5	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2046	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1700	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2046	1700		vph
Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	512	425		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.980	0.980		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2087 1734 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2087 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3821	4700	No
v_{R12}	3821	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 33.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M_S = 0.485

Space mean speed in ramp influence area, S_R = 53.8 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 53.8 mph

Analyst: ew

Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack W
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3321	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3321		350			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1198		88			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	3387		357			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3387 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3744	4700	No
v_{R12}	3744	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 33.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M_S = 0.472

Space mean speed in ramp influence area, S_R = 54.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.1 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: SB Off
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6290	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6290	495		vph
Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	1573	124		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.980	0.980		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6416	505		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6416 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6921	4700	Yes
v_{R12}	6921	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 58.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 4.264

```
Space mean speed in ramp influence area,      S  = -33.1   mph
                                               R
Space mean speed in outer lanes,              S  =  N/A    mph
                                               0
Space mean speed for all vehicles,            S  =         mph
```

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Existing
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5795	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1261	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5795		1261			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1449					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	5911		1286			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5911 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7197	4700	Yes
v_{R12}	7197	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 60.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 5.524	
Space mean speed in ramp influence area,	S_R = -62.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S =	mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	PM
Freeway/Dir of Travel:	
Junction:	SB On
Jurisdiction:	
Analysis Year:	Existing
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4790	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	256	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	4790	256	vph
Peak-hour factor, PHF	1.00	1.00	
Peak 15-min volume, v15	1198	64	v
Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4886	261	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4886 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5147	4700	Yes
v_{R12}	5147	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 44.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.977	
Space mean speed in ramp influence area,	S_R = 42.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 42.5	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Baseline-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5125	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1081	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5125		1081			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1488		275			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	5227		1103			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5227 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6330	4700	Yes
v_{R12}	6330	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 53.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S	= 2.496	
Space mean speed in ramp influence area,	S_R	= 7.6	mph
Space mean speed in outer lanes,	S_0	= N/A	mph
Space mean speed for all vehicles,	S	= 7.6	mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	NB Mack W
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6206	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	585	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6206		585			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1552					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	6330		597			pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6330 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6927	4700	Yes
v_{R12}	6927	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 58.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S =	4.283	
Space mean speed in ramp influence area,	S_R =	-33.5	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =		mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	SB Off
Jurisdiction:	
Analysis Year:	Baseline-NP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3540	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	356	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3540	356		vph
Peak-hour factor, PHF	1.00	1.00		

Peak 15-min volume, v15	885	89	v
Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3611	363	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3611 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3974	4700	No
v_{R12}	3974	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 35.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, M_S = 0.519

Space mean speed in ramp influence area, S_R = 53.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 53.1 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Baseline-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3273	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	889	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3273		889			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1131					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	3338		907			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3338 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4245	4700	No
v_{R12}	4245	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 37.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S =	0.588	
Space mean speed in ramp influence area,	S_R =	51.5	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =	51.5	mph

Analyst: ew

```
Agency/Co.:                Fehr & Peers
Date performed:            8/24/2005
Analysis time period:      AM
Freeway/Dir of Travel:
Junction:                  SB On
Jurisdiction:
Analysis Year:             Baseline-NP
Description:

_________________________________Freeway Data______________________________

Type of analysis                              Merge
Number of lanes in freeway                    2
Free-flow speed on freeway                    65.0         mph
Volume on freeway                             2610         vph

_________________________________On Ramp Data______________________________

Side of freeway                               Right
Number of lanes in ramp                       1
Free-flow speed on ramp                       35.0         mph
Volume on ramp                                149          vph
Length of first accel/decel lane              200          ft
Length of second accel/decel lane                          ft

___________________Conversion to pc/h Under Base Conditions_______________

Junction Components                      Freeway      Ramp        Adjacent
                                                                  Ramp
Volume, V (vph)                          2610         149                   vph
Peak-hour factor, PHF                    1.00         1.00
Peak 15-min volume, v15                  653          38                    v
Trucks and buses                         4            4                     %
Recreational vehicles                    0            0                     %
Terrain type:                            Level        Level
     Grade                                        %            %            %
     Length                                       mi           mi           mi
Trucks and buses PCE, ET                 1.5          1.5
Recreational vehicle PCE, ER             1.2          1.2
Heavy vehicle adjustment, fHV            0.980        0.980
Driver population factor, fP             1.00         1.00
Flow rate, vp                            2662         152                   pcph

_________________________Estimation of V12 Merge Areas_____________________

                    L   =            (Equation 25-2 or 25-3)
                     EQ
                    P   =    1.000   Using Equation  0
                     FM
                    v   = v  (P  ) =  2662   pc/h
                     12    F   FM

______________________________Capacity Checks______________________________

                            Actual        Maximum         LOS F?
     v                      2814          4700            No
      FO
     v                      2814          4600            No
      R12

__________________Level of Service Determination (if not F)_______________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L   =   26.1    pc/mi/ln
```

Level of service for ramp-freeway junction areas of influence C

(R, R, 12, A printed as subscripts above the line)

Speed Estimation

Intermediate speed variable,	M_S = 0.372	
Space mean speed in ramp influence area,	S_R = 56.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.4	mph

Analyst: ew

Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Baseline-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2166	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1785	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2166		1785			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	542					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	2209		1821			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P = 1.000 Using Equation 0

$$v_{12} = v_F (P_{FM}) = 2209 \quad pc/h$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4030	4700	No
v_{R12}	4030	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 34.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S =	0.526	
Space mean speed in ramp influence area,	S_R =	52.9	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =	52.9	mph

Analyst: ew

Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack W
Jurisdiction:
Analysis Year: Baseline-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3504	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3504	350		vph
Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	876	88		v

```
Trucks and buses                        4          4                  %
Recreational vehicles                   0          0                  %
Terrain type:                           Level      Level
     Grade                                     %          %          %
     Length                                    mi         mi         mi
Trucks and buses PCE, ET                1.5        1.5
Recreational vehicle PCE, ER            1.2        1.2
Heavy vehicle adjustment, fHV           0.980      0.980
Driver population factor, fP            1.00       1.00
Flow rate, vp                           3574       357                pcph
_________________________Estimation of V12 Merge Areas_________________________

                   L   =            (Equation 25-2 or 25-3)
                    EQ
                   P   =    1.000   Using Equation  0
                    FM
                   v   = v  (P  ) =  3574   pc/h
                    12    F   FM
_______________________________Capacity Checks_________________________________

                            Actual        Maximum         LOS F?
     v                      3931          4700            No
      FO
     v                      3931          4600            No
      R12
_________________Level of Service Determination (if not F)_____________________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L   =   34.7    pc/mi/ln
          R                   R           12              A
Level of service for ramp-freeway junction areas of influence  D
______________________________Speed Estimation__________________________________

Intermediate speed variable,                    M  = 0.506
                                                 S
Space mean speed in ramp influence area,        S  = 53.4    mph
                                                 R
Space mean speed in outer lanes,                S  =  N/A    mph
                                                 0
Space mean speed for all vehicles,              S  = 53.4    mph
________________________________________________________________________________

 Analyst:                ew
Agency/Co.:             Fehr & Peers
Date performed:         8/24/2005
Analysis time period:   PM
Freeway/Dir of Travel:
Junction:               SB Off
Jurisdiction:
Analysis Year:          Baseline-NP
Description:
_________________________________Freeway Data__________________________________

Type of analysis                                Merge
Number of lanes in freeway                      2
Free-flow speed on freeway                      65.0          mph
Volume on freeway                               6495          vph
________________________________On Ramp Data___________________________________
```

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	530	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6495		530			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1624		133			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	6625		541			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6625 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7166	4700	Yes
v_{R12}	7166	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 60.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 5.361

Space mean speed in ramp influence area, S_R = -58.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	PM

Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Baseline-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5965	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1276	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5965		1276			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15			319			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	6084		1302			pcph

Estimation of V12 Merge Areas

$L_{EQ} =$ (Equation 25-2 or 25-3)

$P_{FM} =$ 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 6084 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7386	4700	Yes
v_{R12}	7386	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 62.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

```
Intermediate speed variable,                 M  = 6.607
                                              S
Space mean speed in ramp influence area,     S  = -87.0    mph
                                              R
Space mean speed in outer lanes,             S  =  N/A     mph
                                              0
Space mean speed for all vehicles,           S  =          mph
```

```
  Analyst:                ew
Agency/Co.:              Fehr & Peers
Date performed:          8/24/2005
Analysis time period:    PM
Freeway/Dir of Travel:
Junction:                SB On
Jurisdiction:
Analysis Year:           Baseline-NP
Description:
```

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4689	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	256	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4689		256			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1198		64			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	4783		261			pcph

Estimation of V12 Merge Areas

```
L  =              (Equation 25-2 or 25-3)
 EQ
P  =     1.000    Using Equation  0
 FM
v   = v  (P  ) =  4783   pc/h
```

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5044	4700	Yes
v_{R12}	5044	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 43.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.912

Space mean speed in ramp influence area, S_R = 44.0 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 44.0 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5125	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1121	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5125		1121			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15						v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	5227		1143			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5227 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6370	4700	Yes
v_{R12}	6370	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 53.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 2.585

Space mean speed in ramp influence area, S_R = 5.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 5.5 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: NB Mack W
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6246	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	585	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6246		585			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1562					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	6371		597			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6371 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6968	4700	Yes
v_{R12}	6968	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 58.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 4.449	
Space mean speed in ramp influence area,	S_R = -37.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S =	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3615	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	356	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3615	356		vph

Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	904	89		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.980	0.980		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	3687	363		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3687 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4050	4700	No
v_{R12}	4050	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 36.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, M_S = 0.536

Space mean speed in ramp influence area, S_R = 52.7 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 52.7 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3348	vph

On Ramp Data

```
Side of freeway                         Right
Number of lanes in ramp                 1
Free-flow speed on ramp                 35.0          mph
Volume on ramp                          987           vph
Length of first accel/decel lane        75            ft
Length of second accel/decel lane                     ft
```

Conversion to pc/h Under Base Conditions

```
Junction Components                 Freeway      Ramp        Adjacent
                                                             Ramp
Volume, V (vph)                     3348         987                  vph
Peak-hour factor, PHF               1.00         1.00
Peak 15-min volume, v15             837          247                  v
Trucks and buses                    4            4                    %
Recreational vehicles               0            0                    %
Terrain type:                       Level        Level
     Grade                                  %            %            %
     Length                                 mi           mi           mi
Trucks and buses PCE, ET            1.5          1.5
Recreational vehicle PCE, ER        1.2          1.2
Heavy vehicle adjustment, fHV       0.980        0.980
Driver population factor, fP        1.00         1.00
Flow rate, vp                       3415         1007                 pcph
```

Estimation of V12 Merge Areas

```
                  L   =           (Equation 25-2 or 25-3)
                   EQ
                  P   =    1.000   Using Equation  0
                   FM
                  v   = v   (P   ) =   3415    pc/h
                   12    F    FM
```

Capacity Checks

```
                        Actual        Maximum         LOS F?
     v                  4422          4700            No
      FO
     v                  4422          4600            No
      R12
```

Level of Service Determination (if not F)

```
Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L   =   39.0    pc/mi/ln
          R                   R          12             A
Level of service for ramp-freeway junction areas of influence  E
```

Speed Estimation

```
Intermediate speed variable,                M  = 0.640
                                             S
Space mean speed in ramp influence area,    S  = 50.3     mph
                                             R
Space mean speed in outer lanes,            S  =  N/A     mph
                                             0
Space mean speed for all vehicles,          S  = 50.3     mph
```

```
Analyst:                 ew
Agency/Co.:              Fehr & Peers
```

```
Date performed:            8/24/2005
Analysis time period:      AM
Freeway/Dir of Travel:
Junction:                  SB On
Jurisdiction:
Analysis Year:             Baseline-PP
Description:

_________________________________Freeway Data____________________________________

Type of analysis                                     Merge
Number of lanes in freeway                           2
Free-flow speed on freeway                           65.0           mph
Volume on freeway                                    2607           vph

_________________________________On Ramp Data____________________________________

Side of freeway                                      Right
Number of lanes in ramp                              1
Free-flow speed on ramp                              35.0           mph
Volume on ramp                                       158            vph
Length of first accel/decel lane                     200            ft
Length of second accel/decel lane                                   ft

______________________Conversion to pc/h Under Base Conditions__________________

Junction Components                        Freeway      Ramp         Adjacent
                                                                     Ramp
Volume, V (vph)                            2607         158                    vph
Peak-hour factor, PHF                      1.00         1.00
Peak 15-min volume, v15                    652          40                     v
Trucks and buses                           4            4                      %
Recreational vehicles                      0            0                      %
Terrain type:                              Level        Level
     Grade                                        %            %            %
     Length                                       mi           mi           mi
Trucks and buses PCE, ET                   1.5          1.5
Recreational vehicle PCE, ER               1.2          1.2
Heavy vehicle adjustment, fHV              0.980        0.980
Driver population factor, fP               1.00         1.00
Flow rate, vp                              2659         161                    pcph

_________________________Estimation of V12 Merge Areas__________________________

                  L   =             (Equation 25-2 or 25-3)
                   EQ
                  P   =     1.000   Using Equation  0
                   FM
                  v   = v  (P  ) =   2659    pc/h
                   12    F   FM

______________________________Capacity Checks___________________________________

                         Actual        Maximum        LOS F?
     v                   2820          4700           No
      FO
     v                   2820          4600           No
      R12

________________Level of Service Determination (if not F)_______________________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L   =   26.1    pc/mi/ln
          R                   R           12            A
```

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S =	0.372	
Space mean speed in ramp influence area,	S_R =	56.4	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =	56.4	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2166	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1903	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2166		1903			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	542		476			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	2209		1941			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v = v (P) =$ 2209 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4150	4700	No
v_{R12}	4150	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 35.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.554	
Space mean speed in ramp influence area,	S_R = 52.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 52.2	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6015	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1326	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6015	1326		vph
Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	1504	332		v

Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	6135	1353	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6135 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7488	4700	Yes
v_{R12}	7488	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 62.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 7.283

Space mean speed in ramp influence area, S_R = -102.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: SB On
Jurisdiction:
Analysis Year: Baseline-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4689	vph

On Ramp Data

```
Side of freeway                                  Right
Number of lanes in ramp                          1
Free-flow speed on ramp                          35.0          mph
Volume on ramp                                   318           vph
Length of first accel/decel lane                 200           ft
Length of second accel/decel lane                              ft

____________________Conversion to pc/h Under Base Conditions___________________

Junction Components                   Freeway      Ramp         Adjacent
                                                                Ramp
Volume, V (vph)                       4689         318                    vph
Peak-hour factor, PHF                 1.00         1.00
Peak 15-min volume, v15               1198         80                     v
Trucks and buses                      4            4                      %
Recreational vehicles                 0            0                      %
Terrain type:                         Level        Level
     Grade                                    %            %            %
     Length                                   mi           mi           mi
Trucks and buses PCE, ET              1.5          1.5
Recreational vehicle PCE, ER          1.2          1.2
Heavy vehicle adjustment, fHV         0.980        0.980
Driver population factor, fP          1.00         1.00
Flow rate, vp                         4783         324                    pcph

_________________________Estimation of V12 Merge Areas_________________________

                  L   =            (Equation 25-2 or 25-3)
                   EQ
                  P   =     1.000   Using Equation  0
                   FM
                  v   = v   (P   ) =   4783    pc/h
                   12    F    FM

_______________________________Capacity Checks_________________________________

                            Actual        Maximum         LOS F?
     v                      5107          4700            Yes
      FO
     v                      5107          4600            Yes
      R12

_________________Level of Service Determination (if not F)_____________________

Density, D = 5.475 + 0.00734 v   + 0.0078 v    - 0.00627 L   =   43.9    pc/mi/ln
          R                   R            12             A
Level of service for ramp-freeway junction areas of influence  F

_____________________________Speed Estimation__________________________________

Intermediate speed variable,                     M  = 0.951
                                                  S
Space mean speed in ramp influence area,         S  = 43.1     mph
                                                  R
Space mean speed in outer lanes,                 S  =  N/A     mph
                                                  0
Space mean speed for all vehicles,               S  = 43.1     mph
_______________________________________________________________________________
```

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Cum-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5950	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1100	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5950		1100			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1488		275			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	6069		1122			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 6069 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7191	4700	Yes
v_{R12}	7191	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 59.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 5.484

Space mean speed in ramp influence area, S_R = -61.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	NB Mack W
Jurisdiction:	
Analysis Year:	Cum-NP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7060	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1200	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	7060		1200			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1765		300			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	7201		1224			pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)

$P_{FM}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 7201$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	8425	4700	Yes
v_{R12}	8425	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 69.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S =	18.090	
Space mean speed in ramp influence area,	S_R =	-351.1	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =		mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	SB Off
Jurisdiction:	
Analysis Year:	Cum-NP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4119	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	384	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4119	384		vph
Peak-hour factor, PHF	1.00	1.00		

Peak 15-min volume, v15	1030	96	v
Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4201	392	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4201 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4593	4700	No
v_{R12}	4593	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 40.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, M_S = 0.697

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 49.0 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Cum-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3831	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1010	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3831		1010			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	958		253			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	3908		1030			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3908 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4938	4700	Yes
v_{R12}	4938	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 43.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.860	
Space mean speed in ramp influence area,	S_R = 45.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 45.2	mph

Analyst: ew

```
Agency/Co.:                 Fehr & Peers
Date performed:             8/24/2005
Analysis time period:       AM
Freeway/Dir of Travel:
Junction:                   SB On
Jurisdiction:
Analysis Year:              Cum-NP
Description:

_________________________________Freeway Data_________________________________

Type of analysis                             Merge
Number of lanes in freeway                   2
Free-flow speed on freeway                   65.0            mph
Volume on freeway                            3072            vph

_________________________________On Ramp Data_________________________________

Side of freeway                              Right
Number of lanes in ramp                      1
Free-flow speed on ramp                      35.0            mph
Volume on ramp                               260             vph
Length of first accel/decel lane             200             ft
Length of second accel/decel lane                            ft

___________________Conversion to pc/h Under Base Conditions___________________

Junction Components                     Freeway      Ramp         Adjacent
                                                                  Ramp
Volume, V (vph)                         3072         260                    vph
Peak-hour factor, PHF                   1.00         1.00
Peak 15-min volume, v15                 768          65                     v
Trucks and buses                        4            4                      %
Recreational vehicles                   0            0                      %
Terrain type:                           Level        Level
     Grade                                      %            %            %
     Length                                     mi           mi           mi
Trucks and buses PCE, ET                1.5          1.5
Recreational vehicle PCE, ER            1.2          1.2
Heavy vehicle adjustment, fHV           0.980        0.980
Driver population factor, fP            1.00         1.00
Flow rate, vp                           3133         265                    pcph

________________________Estimation of V12 Merge Areas_________________________

                  L   =            (Equation 25-2 or 25-3)
                   EQ
                  P   =    1.000   Using Equation  0
                   FM
                  v   = v   (P   ) =  3133   pc/h
                   12    F    FM

______________________________Capacity Checks_________________________________

                        Actual        Maximum         LOS F?
     v                  3398          4700            No
      FO
     v                  3398          4600            No
      R12

_________________Level of Service Determination (if not F)____________________
```

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.424		
Space mean speed in ramp influence area,	S_R = 55.3	mph	
Space mean speed in outer lanes,	S_0 = N/A	mph	
Space mean speed for all vehicles,	S = 55.3	mph	

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack E
Jurisdiction:
Analysis Year: Cum-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2244	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1760	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2244		1760			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	561		440			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	2289		1795			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2289 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4084	4700	No
v_{R12}	4084	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 35.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.539	
Space mean speed in ramp influence area,	S_R = 52.6	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 52.6	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack W
Jurisdiction:
Analysis Year: Cum-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3564	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3564	940		vph

```
Peak-hour factor, PHF                  1.00         1.00
Peak 15-min volume, v15                891          235                 v
Trucks and buses                       4            4                   %
Recreational vehicles                  0            0                   %
Terrain type:                          Level        Level
     Grade                                    %            %            %
     Length                                   mi           mi           mi
Trucks and buses PCE, ET               1.5          1.5
Recreational vehicle PCE, ER           1.2          1.2
Heavy vehicle adjustment, fHV          0.980        0.980
Driver population factor, fP           1.00         1.00
Flow rate, vp                          3635         959                 pcph

_________________________Estimation of V12 Merge Areas_________________________

                  L   =             (Equation 25-2 or 25-3)
                   EQ
                  P   =     1.000   Using Equation  0
                   FM
                  v   = v   (P   ) =   3635    pc/h
                   12    F    FM

______________________________Capacity Checks______________________________

                           Actual         Maximum          LOS F?
      v                    4594           4700             No
       FO
      v                    4594           4600             No
       R12

_______________Level of Service Determination (if not F)_______________

Density, D = 5.475 + 0.00734 v   + 0.0078 v    - 0.00627 L    =    39.6    pc/mi/ln
          R                   R            12             A
Level of service for ramp-freeway junction areas of influence  E

_____________________________Speed Estimation_____________________________

Intermediate speed variable,                       M   = 0.693
                                                    S
Space mean speed in ramp influence area,           S   = 49.1     mph
                                                    R
Space mean speed in outer lanes,                   S   =  N/A     mph
                                                    0
Space mean speed for all vehicles,                 S   = 49.1     mph
_______________________________________________________________________________
 Analyst:                  ew
Agency/Co.:               Fehr & Peers
Date performed:           8/24/2005
Analysis time period:     PM
Freeway/Dir of Travel:
Junction:                 SB Off
Jurisdiction:
Analysis Year:            Cum-NP
Description:

________________________________Freeway Data________________________________

Type of analysis                                  Merge
Number of lanes in freeway                        2
Free-flow speed on freeway                        65.0          mph
Volume on freeway                                 7770          vph
```

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	575	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	7770		575			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1943		144			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	7925		586			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 7925 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	8511	4700	Yes
v_{R12}	8511	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 70.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 19.692

Space mean speed in ramp influence area, S_R = -387.9 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005

```
Analysis time period:   PM
Freeway/Dir of Travel:
Junction:               SB Off w/ split
Jurisdiction:
Analysis Year:          Cum-NP
Description:

_____________________________Freeway Data_____________________________

Type of analysis                          Merge
Number of lanes in freeway                2
Free-flow speed on freeway                65.0          mph
Volume on freeway                         7195          vph

_____________________________On Ramp Data_____________________________

Side of freeway                           Right
Number of lanes in ramp                   1
Free-flow speed on ramp                   35.0          mph
Volume on ramp                            1565          vph
Length of first accel/decel lane          75            ft
Length of second accel/decel lane                       ft

________________Conversion to pc/h Under Base Conditions________________

Junction Components                  Freeway      Ramp         Adjacent
                                                               Ramp
Volume, V (vph)                      7195         1565                  vph
Peak-hour factor, PHF                1.00         1.00
Peak 15-min volume, v15              1799                               v
Trucks and buses                     4            4                     %
Recreational vehicles                0            0                     %
Terrain type:                        Level        Level
    Grade                                  %            %            %
    Length                                 mi           mi           mi
Trucks and buses PCE, ET             1.5          1.5
Recreational vehicle PCE, ER         1.2          1.2
Heavy vehicle adjustment, fHV        0.980        0.980
Driver population factor, fP         1.00         1.00
Flow rate, vp                        7339         1596                  pcph

_____________________Estimation of V12 Merge Areas_____________________

              L   =             (Equation 25-2 or 25-3)
               EQ
              P   =    1.000   Using Equation  0
               FM
              v   = v  (P  ) =  7339    pc/h
               12    F   FM

___________________________Capacity Checks___________________________

                    Actual        Maximum       LOS F?
    v               8935          4700          Yes
     FO
    v               8935          4600          Yes
     R12

______________Level of Service Determination (if not F)______________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L  =   74.0    pc/mi/ln
          R                   R           12            A
Level of service for ramp-freeway junction areas of influence  F
```

Speed Estimation

Intermediate speed variable,	M_S =	29.929	
Space mean speed in ramp influence area,	S_R =	-623.4	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =		mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: SB On
Jurisdiction:
Analysis Year: Cum-NP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5630	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	410	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5630		410			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1408		103			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	5743		418			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5743 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6161	4700	Yes
v_{R12}	6161	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 52.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 2.155

Space mean speed in ramp influence area, S_R = 15.4 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 15.4 mph

```
Analyst:                  ew
Agency/Co.:               Fehr & Peers
Date performed:           8/24/2005
Analysis time period:     AM
Freeway/Dir of Travel:
Junction:                 NB Mack E
Jurisdiction:
Analysis Year:            Cum-PP
Description:

__________________________________Freeway Data__________________________________

Type of analysis                              Merge
Number of lanes in freeway                    2
Free-flow speed on freeway                    65.0          mph
Volume on freeway                             5950          vph

__________________________________On Ramp Data__________________________________

Side of freeway                               Right
Number of lanes in ramp                       1
Free-flow speed on ramp                       35.0          mph
Volume on ramp                                1140          vph
Length of first accel/decel lane              200           ft
Length of second accel/decel lane                           ft

____________________Conversion to pc/h Under Base Conditions____________________

Junction Components                    Freeway      Ramp         Adjacent
                                                                 Ramp
Volume, V (vph)                        5950         1140                 vph
Peak-hour factor, PHF                  1.00         1.00
Peak 15-min volume, v15                1488         285                  v
Trucks and buses                       4            4                    %
Recreational vehicles                  0            0                    %
Terrain type:                          Level        Level
     Grade                                    %            %            %
     Length                                   mi           mi           mi
Trucks and buses PCE, ET               1.5          1.5
Recreational vehicle PCE, ER           1.2          1.2
Heavy vehicle adjustment, fHV          0.980        0.980
Driver population factor, fP           1.00         1.00
Flow rate, vp                          6069         1163                 pcph

_________________________Estimation of V12 Merge Areas_________________________

                  L   =             (Equation 25-2 or 25-3)
                   EQ
                  P   =     1.000   Using Equation  0
                   FM
                  v   = v  (P  ) =   6069    pc/h
                   12    F   FM

______________________________Capacity Checks______________________________

                           Actual        Maximum        LOS F?
         v                 7232          4700           Yes
          FO
         v                 7232          4600           Yes
          R12

________________Level of Service Determination (if not F)________________
```

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 60.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S =	5.701	
Space mean speed in ramp influence area,	S_R =	-66.1	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =		mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	NB Mack W
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7090	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1200	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	7090		1200			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1773		300			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	7232		1224			pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 7232 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	8456	4700	Yes
v_{R12}	8456	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 69.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 18.650

Space mean speed in ramp influence area, S_R = -363.9 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off
Jurisdiction:
Analysis Year: Cum-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4191	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	384	vph
Length of first accel/decel lane	130	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4191	384		vph

Peak-hour factor, PHF	1.00	1.00	
Peak 15-min volume, v15	1048	96	v
Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4275	392	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4275 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4667	4700	No
v_{R12}	4667	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 40.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.727

Space mean speed in ramp influence area, S_R = 48.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 48.3 mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: AM
Freeway/Dir of Travel:
Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Cum-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3903	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1108	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3903		1108			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	976		277			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	3981		1130			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3981 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5111	4700	Yes
v_{R12}	5111	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 44.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.963	
Space mean speed in ramp influence area,	S_R = 42.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 42.9	mph

Analyst: ew

Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	AM
Freeway/Dir of Travel:	
Junction:	SB On
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3072	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	269	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3072		269			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	768					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	3133		274			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3133 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3407	4700	No
v_{R12}	3407	4600	No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.7 pc/mi/ln

```
     R                   R          12          A
Level of service for ramp-freeway junction areas of influence  D

____________________________Speed Estimation________________________

Intermediate speed variable,                   M  = 0.425
                                                S
Space mean speed in ramp influence area,       S  = 55.2     mph
                                                R
Space mean speed in outer lanes,               S  =  N/A     mph
                                                0
Space mean speed for all vehicles,             S  = 55.2     mph
_____________________________________________________________________

Analyst:                  ew
Agency/Co.:               Fehr & Peers
Date performed:           8/24/2005
Analysis time period:     PM
Freeway/Dir of Travel:
Junction:                 NB Mack E
Jurisdiction:
Analysis Year:            Cum-PP
Description:

________________________________Freeway Data_________________________

Type of analysis                             Merge
Number of lanes in freeway                   2
Free-flow speed on freeway                   65.0          mph
Volume on freeway                            2166          vph

________________________________On Ramp Data_________________________

Side of freeway                              Right
Number of lanes in ramp                      1
Free-flow speed on ramp                      35.0          mph
Volume on ramp                               1878          vph
Length of first accel/decel lane             200           ft
Length of second accel/decel lane                          ft

____________________Conversion to pc/h Under Base Conditions_________

Junction Components                     Freeway     Ramp       Adjacent
                                                               Ramp
Volume, V (vph)                         2166        1878                vph
Peak-hour factor, PHF                   1.00        1.00
Peak 15-min volume, v15                 542         470                 v
Trucks and buses                        4           4                   %
Recreational vehicles                   0           0                   %
Terrain type:                           Level       Level
     Grade                                     %           %         %
     Length                                    mi          mi        mi
Trucks and buses PCE, ET                1.5         1.5
Recreational vehicle PCE, ER            1.2         1.2
Heavy vehicle adjustment, fHV           0.980       0.980
Driver population factor, fP            1.00        1.00
Flow rate, vp                           2209        1916                pcph

_________________________Estimation of V12 Merge Areas_______________

               L  =            (Equation 25-2 or 25-3)
                EQ
               P  =    1.000   Using Equation  0
```

$$v_{12} = v_F (P_{FM}) = 2209 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4125	4700	No
v_{R12}	4125	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 35.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S =	0.548	
Space mean speed in ramp influence area,	S_R =	52.4	mph
Space mean speed in outer lanes,	S_0 =	N/A	mph
Space mean speed for all vehicles,	S =	52.4	mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: NB Mack W
Jurisdiction:
Analysis Year: Cum-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3651	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3651	940		vph
Peak-hour factor, PHF	1.00	1.00		
Peak 15-min volume, v15	913	235		v
Trucks and buses	4	4		%

Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3724	959	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3724 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4683	4700	No
v_{R12}	4683	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 40.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.729	
Space mean speed in ramp influence area,	S_R = 48.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 48.2	mph

Analyst:	ew
Agency/Co.:	Fehr & Peers
Date performed:	8/24/2005
Analysis time period:	PM
Freeway/Dir of Travel:	
Junction:	SB Off
Jurisdiction:	
Analysis Year:	Cum-PP
Description:	

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7820	vph

On Ramp Data

Side of freeway	Right

```
Number of lanes in ramp                      1
Free-flow speed on ramp                      35.0           mph
Volume on ramp                               575            vph
Length of first accel/decel lane             130            ft
Length of second accel/decel lane                           ft

___________________Conversion to pc/h Under Base Conditions__________________

Junction Components                     Freeway      Ramp         Adjacent
                                                                  Ramp
Volume, V (vph)                         7820         575                    vph
Peak-hour factor, PHF                   1.00         1.00
Peak 15-min volume, v15                 1955         144                    v
Trucks and buses                        4            4                      %
Recreational vehicles                   0            0                      %
Terrain type:                           Level        Level
     Grade                                     %            %            %
     Length                                    mi           mi           mi
Trucks and buses PCE, ET                1.5          1.5
Recreational vehicle PCE, ER            1.2          1.2
Heavy vehicle adjustment, fHV           0.980        0.980
Driver population factor, fP            1.00         1.00
Flow rate, vp                           7976         586                    pcph

_________________________Estimation of V12 Merge Areas_______________________

                  L  =              (Equation 25-2 or 25-3)
                   EQ
                  P  =    1.000   Using Equation  0
                   FM
                  v  = v  (P  ) =  7976   pc/h
                   12   F   FM

______________________________Capacity Checks________________________________

                           Actual         Maximum         LOS F?
      v                    8562           4700            Yes
       FO
      v                    8562           4600            Yes
       R12

________________Level of Service Determination (if not F)___________________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L  =   71.2   pc/mi/ln
          R                   R           12            A
Level of service for ramp-freeway junction areas of influence  F

____________________________Speed Estimation_________________________________

Intermediate speed variable,                    M  = 20.706
                                                 S
Space mean speed in ramp influence area,        S  = -411.2  mph
                                                 R
Space mean speed in outer lanes,                S  =  N/A    mph
                                                 0
Space mean speed for all vehicles,              S  =         mph
_____________________________________________________________________________
 Analyst:                 ew
Agency/Co.:               Fehr & Peers
Date performed:           8/24/2005
Analysis time period:     PM
Freeway/Dir of Travel:
```

Junction: SB Off w/ split
Jurisdiction:
Analysis Year: Cum-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7245	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1615	vph
Length of first accel/decel lane	75	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	7245		1615			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15			404			v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	7390		1647			pcph

Estimation of V12 Merge Areas

$L_{EQ} =$ (Equation 25-2 or 25-3)

$P_{FM} =$ 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 7390 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	9037	4700	Yes
v_{R12}	9037	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 74.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 33.109

Space mean speed in ramp influence area, S_R = -696.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = mph

Analyst: ew
Agency/Co.: Fehr & Peers
Date performed: 8/24/2005
Analysis time period: PM
Freeway/Dir of Travel:
Junction: SB On
Jurisdiction:
Analysis Year: Cum-PP
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	5630	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	437	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	5630		437			vph
Peak-hour factor, PHF	1.00		1.00			
Peak 15-min volume, v15	1408					v
Trucks and buses	4		4			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		%		%	%	
Length		mi		mi	mi	
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			
Heavy vehicle adjustment, fHV	0.980		0.980			
Driver population factor, fP	1.00		1.00			
Flow rate, vp	5743		446			pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5743 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6189	4700	Yes
v_{R12}	6189	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 52.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 2.208

Space mean speed in ramp influence area, S_R = 14.2 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 14.2 mph

FEHR & PEERS
TRANSPORTATION CONSULTANTS

				Project No	SA05-0032 Page No
				Subject	4. Valley Hi Dr./Wyndham Dr.
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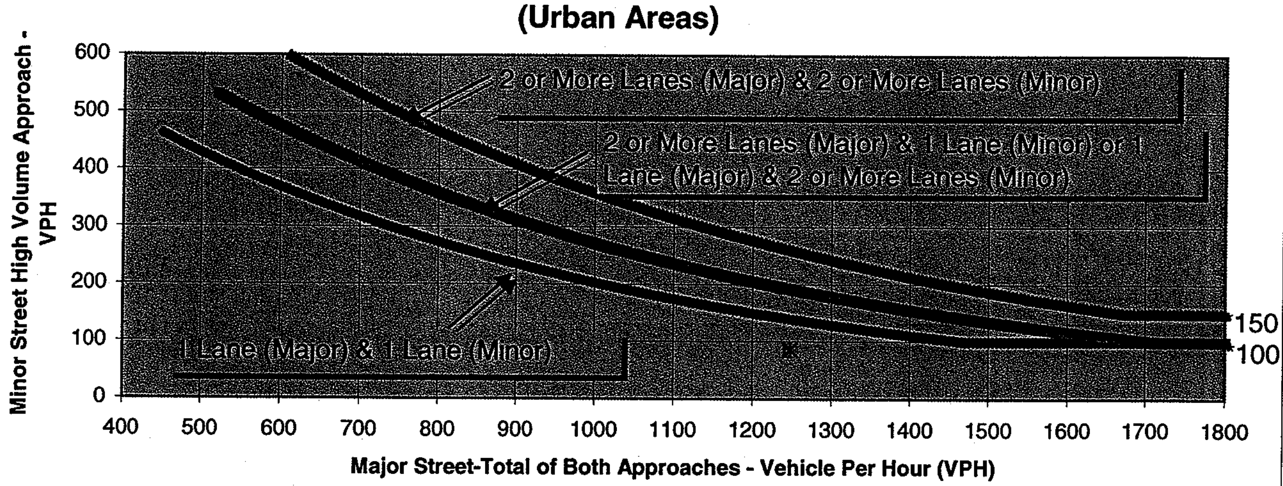
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1247	86	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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Subject	4. Valley Hi Dr./Wyndham Dr.				
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Figure 9-8
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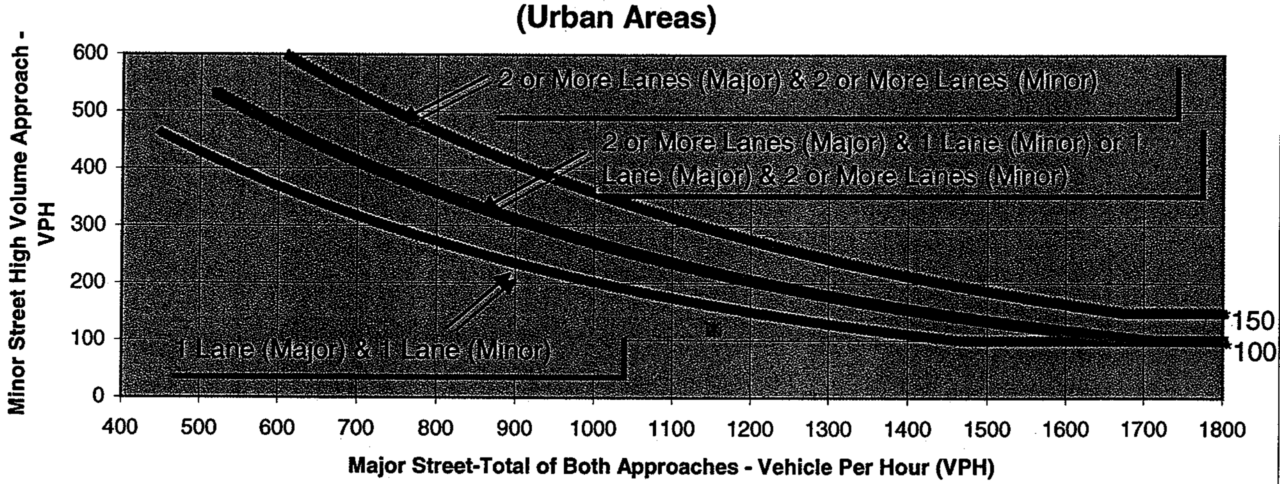
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1153	121	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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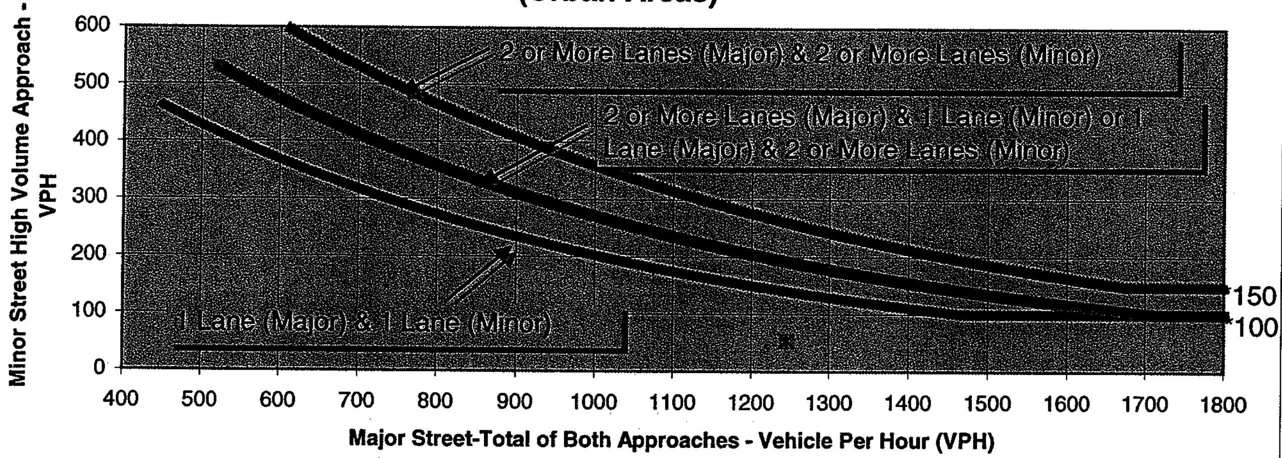
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1245	54	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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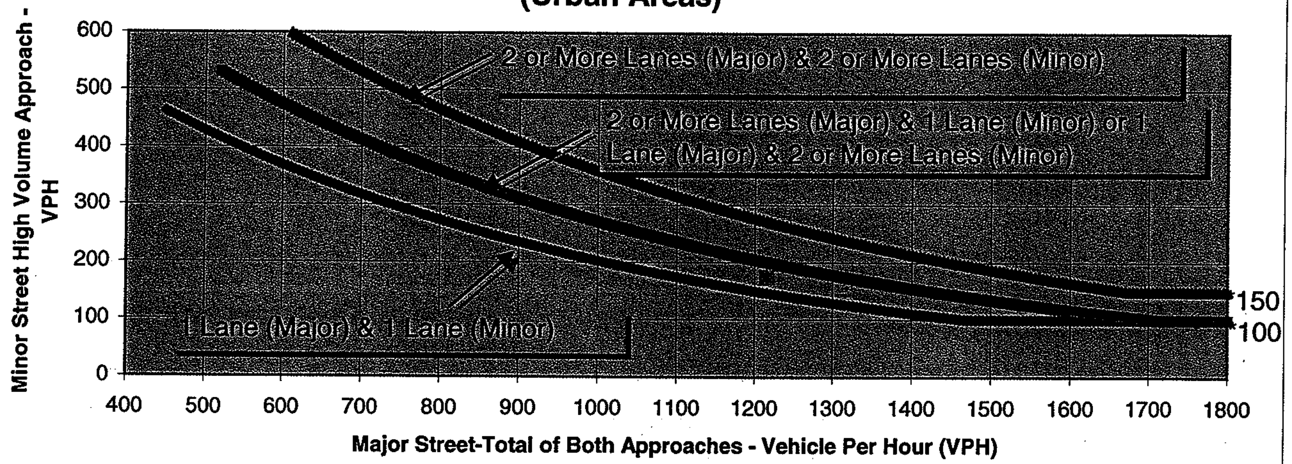
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		**Major Street**	**Minor Street**	**Warrant Met**
Number of Lanes	Two or More Lane (Y/N)	y	n	**NO**
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1215	175	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☑ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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			Subject	9. Arroyo Vista Dr./Wyndham Dr.	
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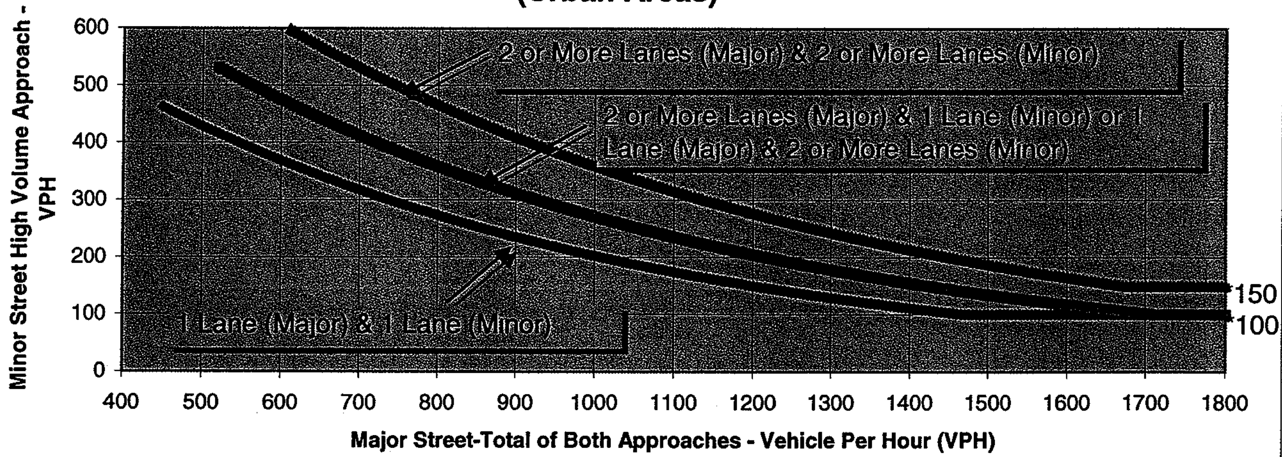
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		383	27	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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				Project No	SA05-0032 Page No
				Subject	9. Arroyo Vista Dr./Wyndham Dr.
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Figure 9-8
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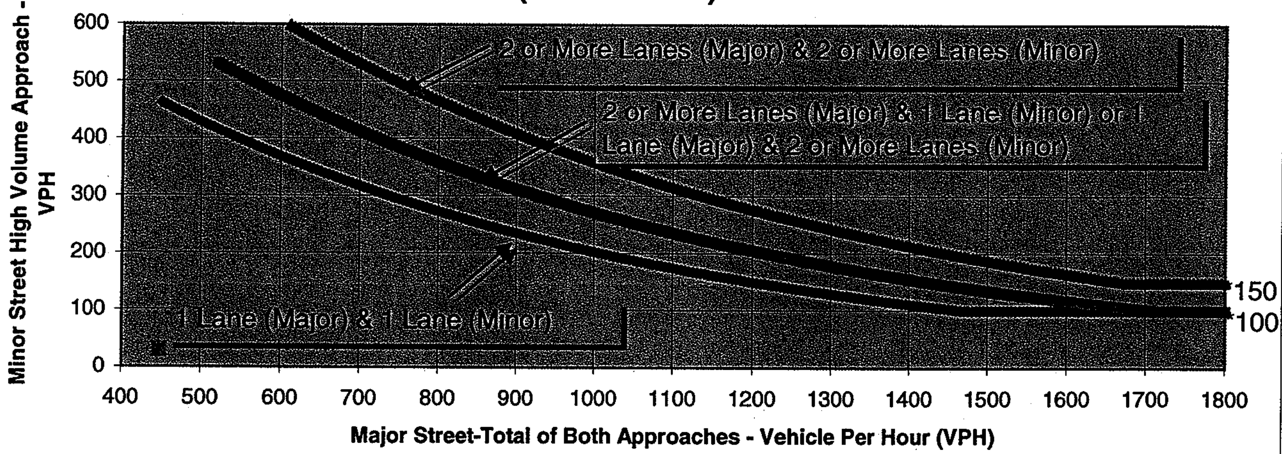
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		448	31	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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Computed by	Kevin Johnson	Date	2/28/2006		Existing Conditions
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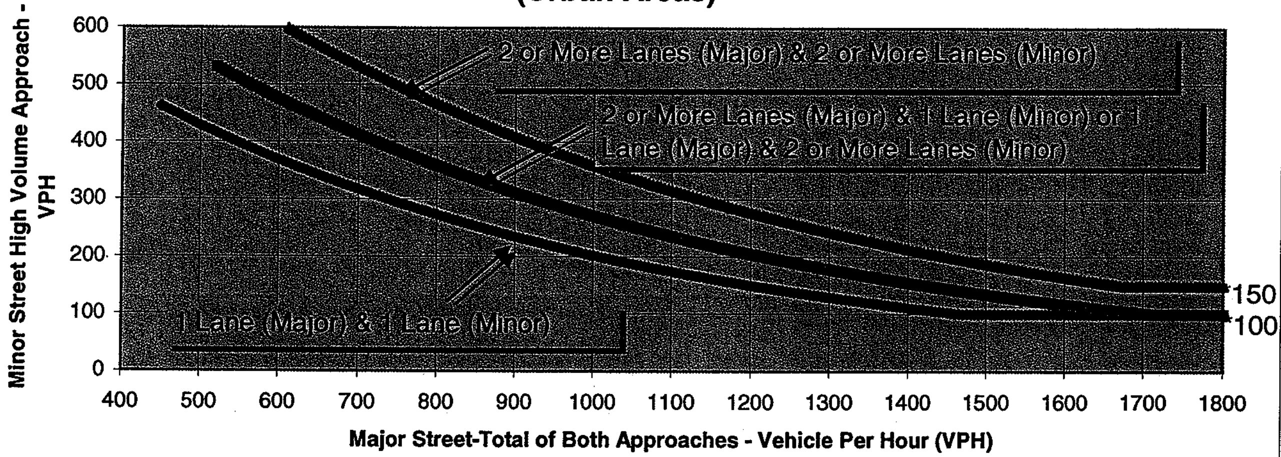
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		396	51	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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Approved by		Date	

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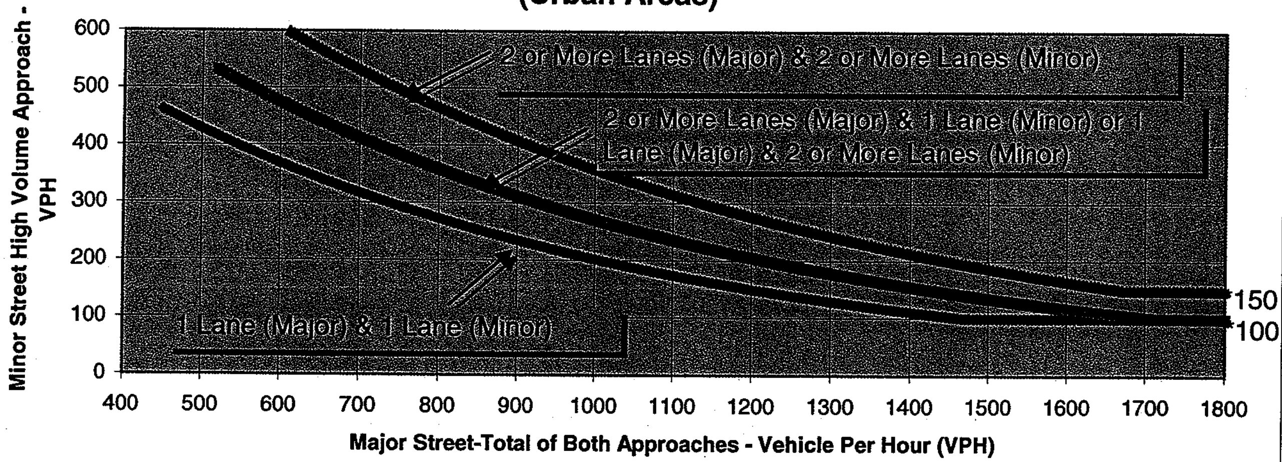
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		367	85	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [x] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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Figure 9-8
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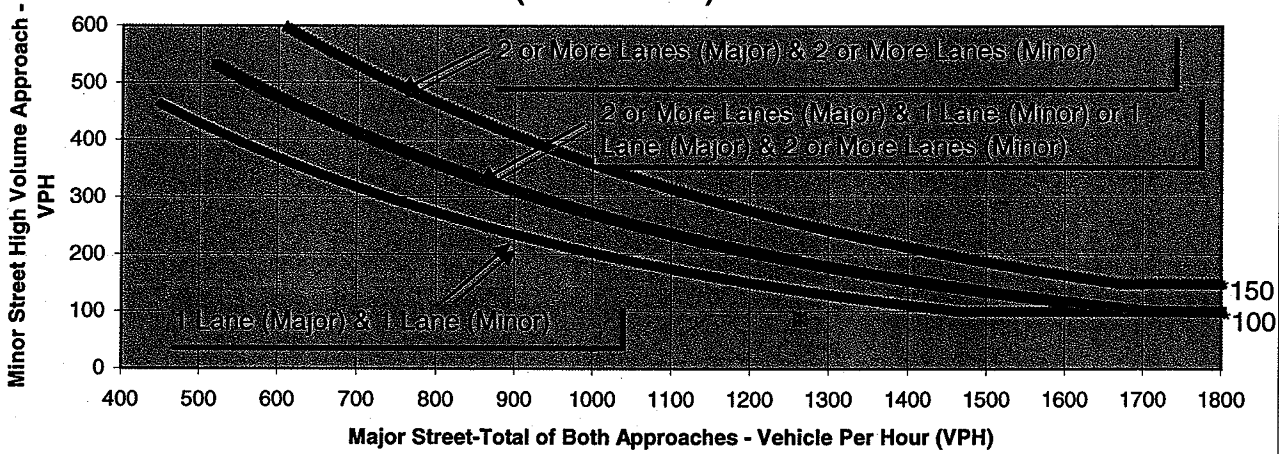
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1264	88	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Checked by		Date			PM Peak Hour Traffic Volume
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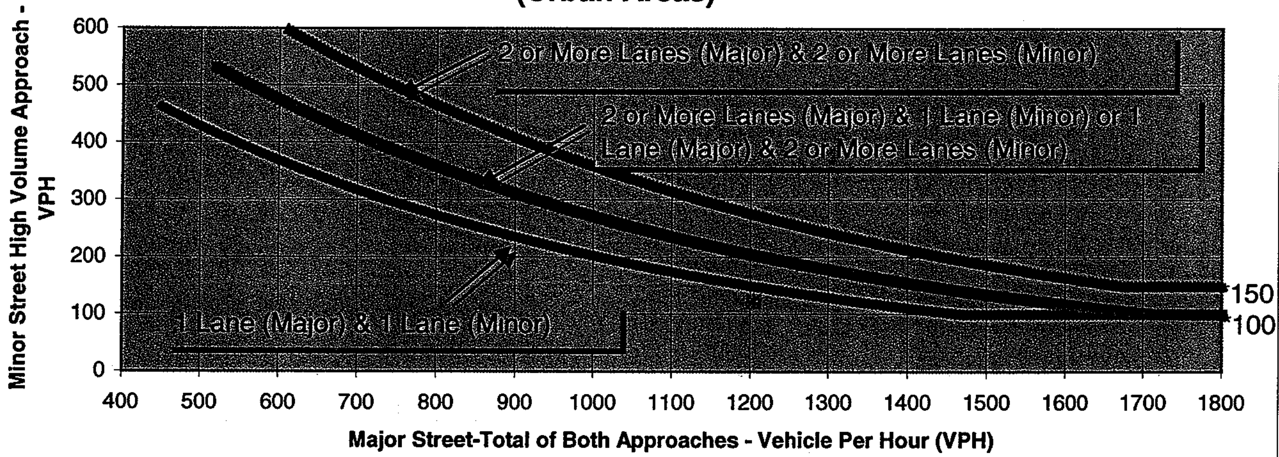
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1204	124	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Checked by		Date			AM Peak Hour Traffic Volume
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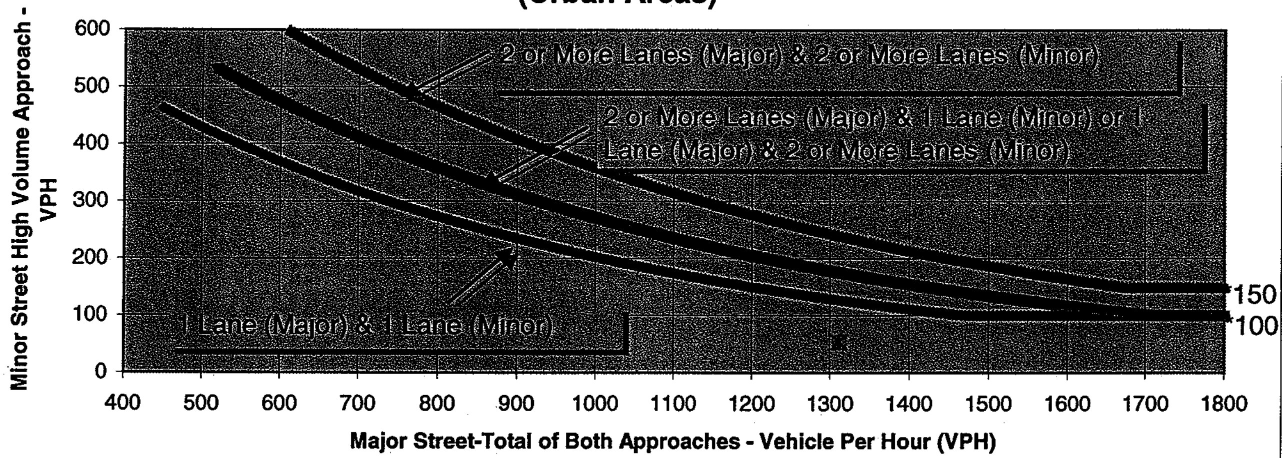
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1311	54	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Checked by		Date			PM Peak Hour Traffic Volume
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Figure 9-8
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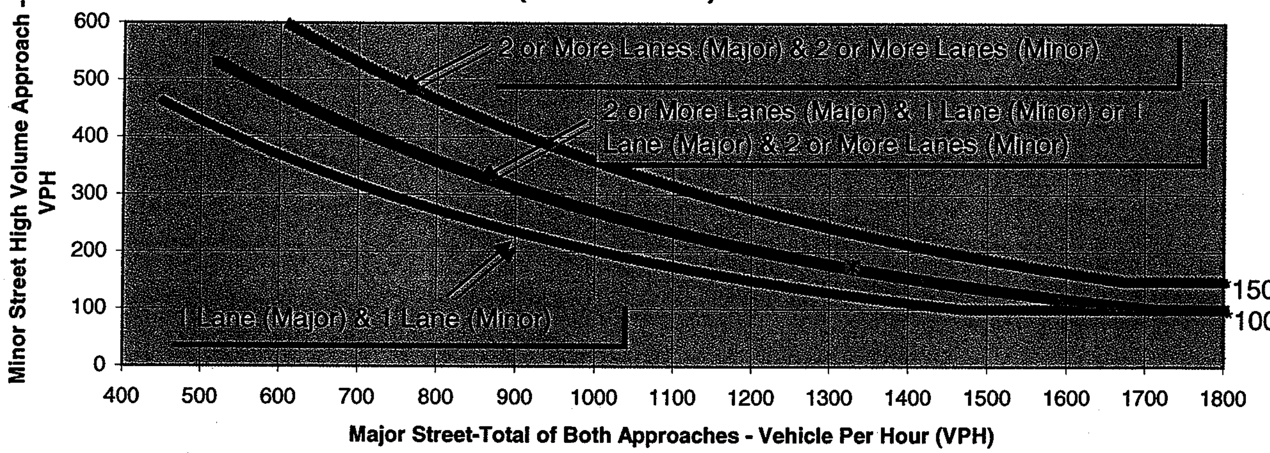
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	**YES**
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1329	175	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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				Project No	SA05-0032 Page No
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Checked by		Date			AM Peak Hour Traffic Volume
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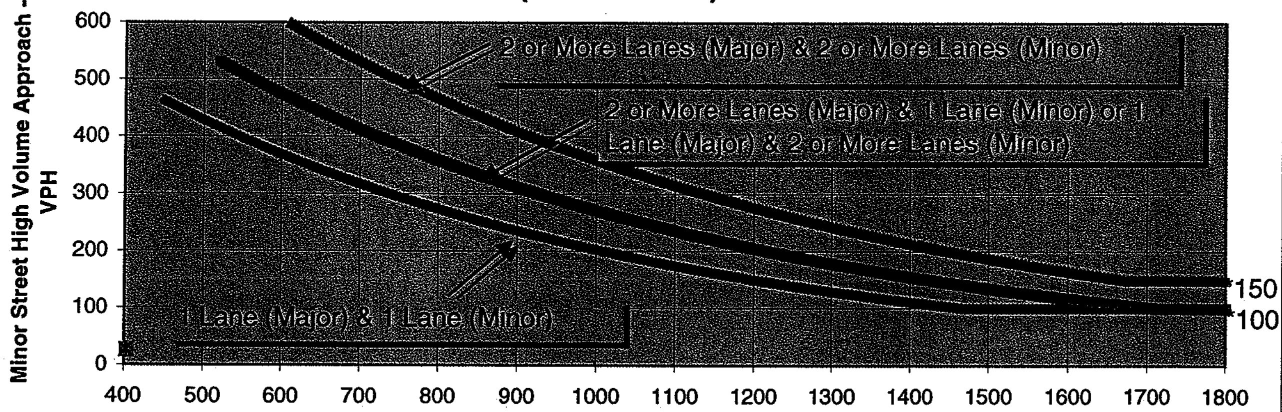
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		403	27	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Checked by		Date			PM Peak Hour Traffic Volume
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Figure 9-8
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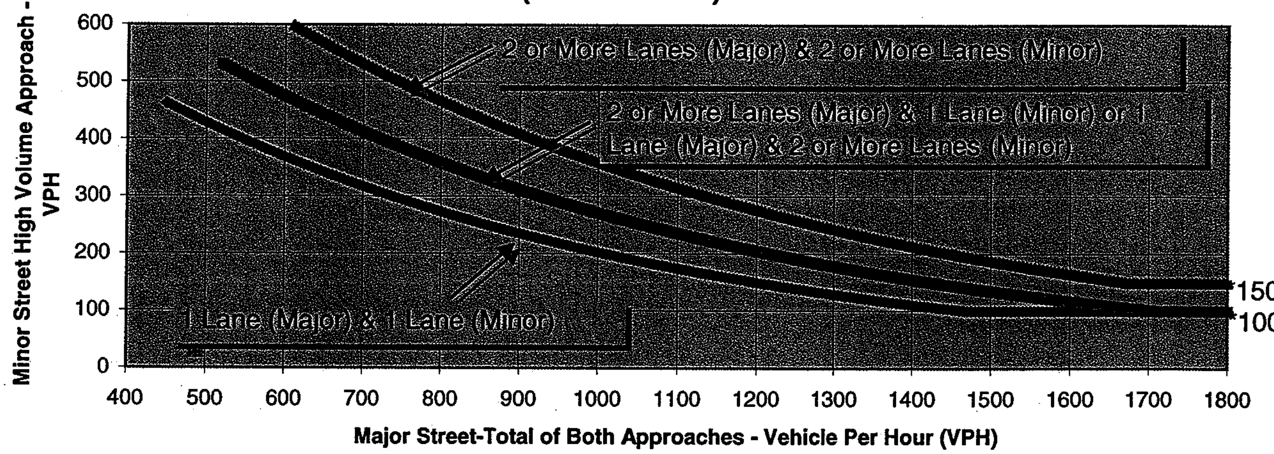

*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		488	31	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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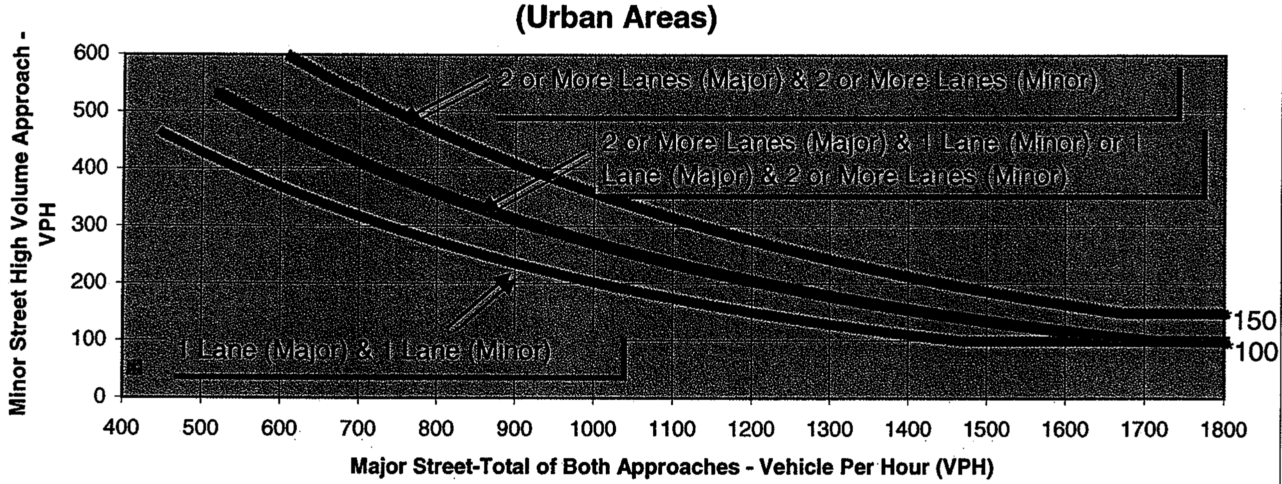
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		416	51	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
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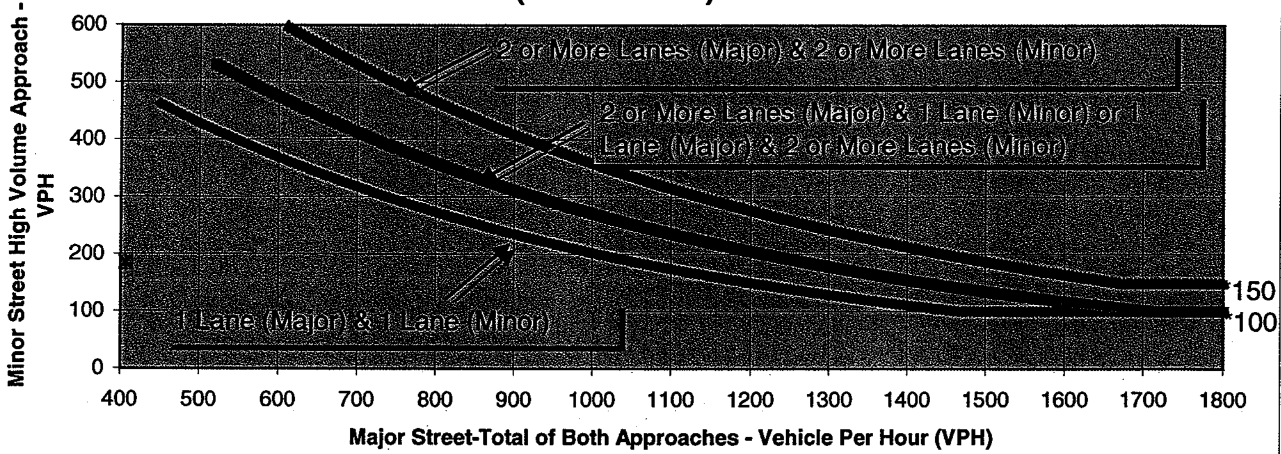
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		407	185	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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			Subject	4. Valley Hi Dr./Wyndham Dr.	
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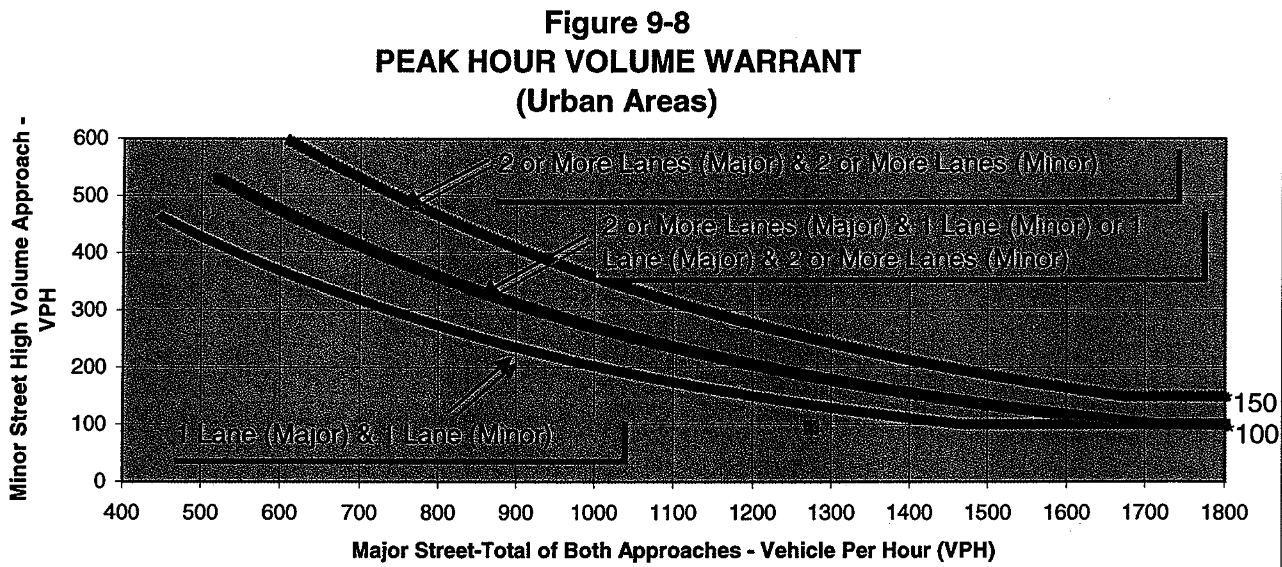
Approved by		Date	Sheet No		of



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1274	95	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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				Project No	SA05-0032 Page No
				Subject	4. Valley Hi Dr./Wyndham Dr.
Computed by	Kevin Johnson	Date	2/28/2006		Baseline Plus Project Conditions
Checked by		Date			PM Peak Hour Traffic Volume
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Figure 9-8
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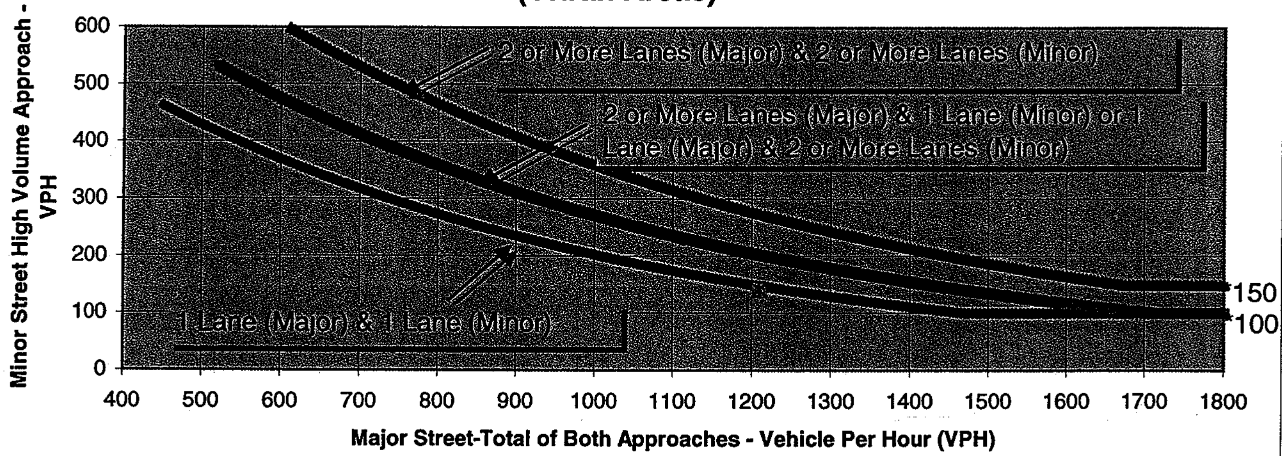
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1209	141	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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				Subject	7. Bruceville Rd./Kaiser Access
Computed by	Kevin Johnson	Date	2/28/2006		Baseline Plus Project Conditions
Checked by		Date			AM Peak Hour Traffic Volume
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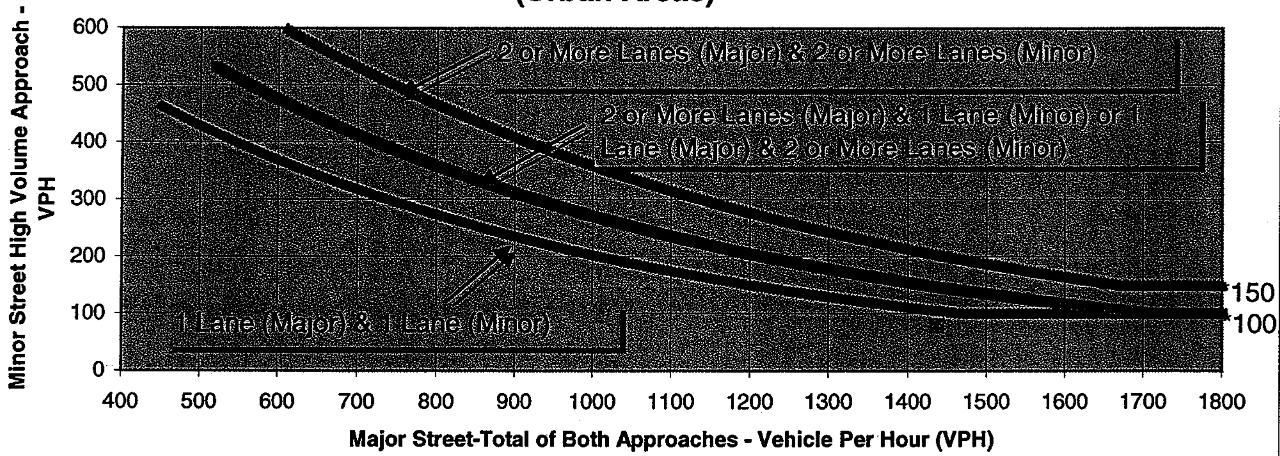
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1437	80	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
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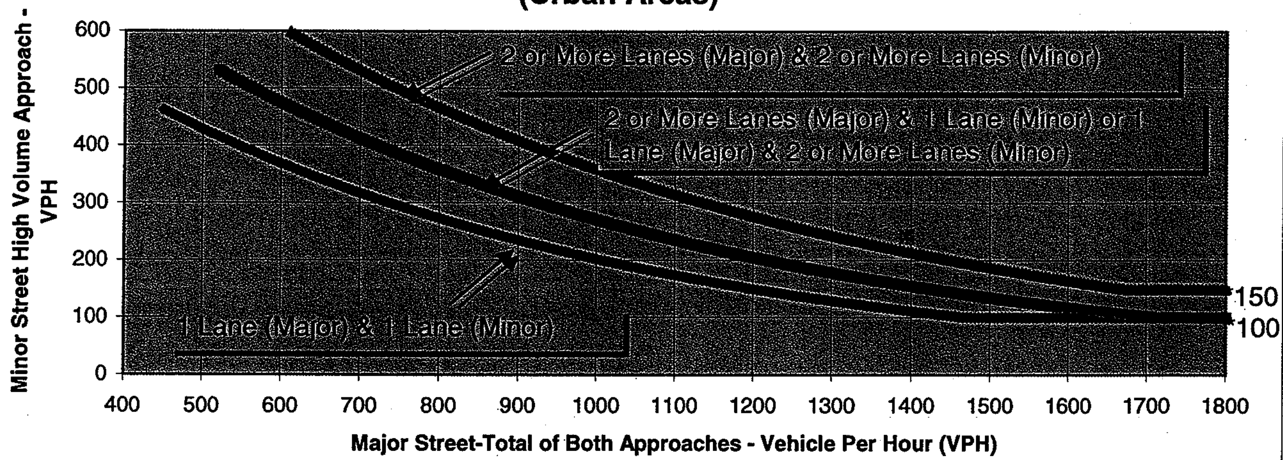

*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	YES
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1394	242	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
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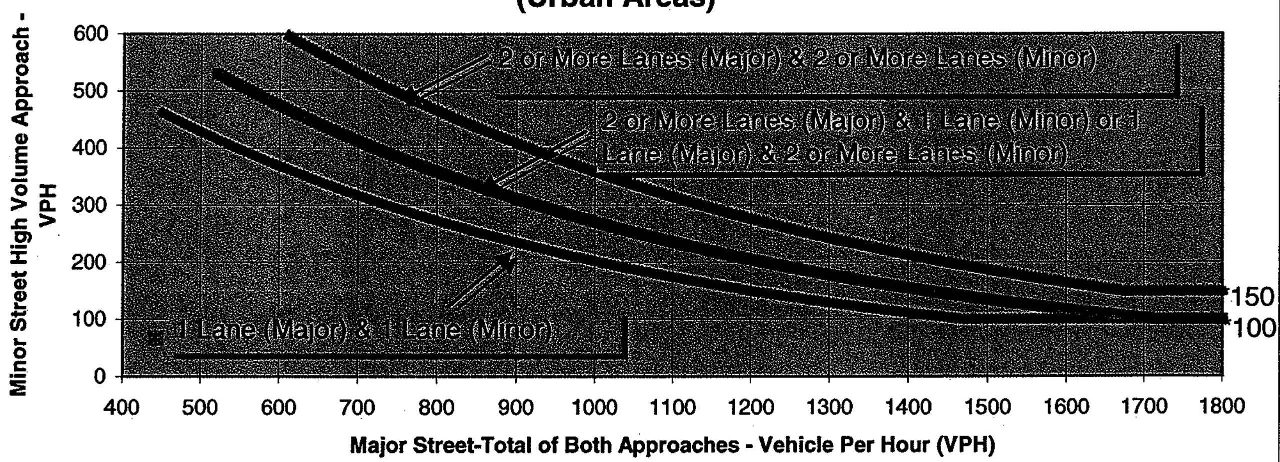
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		443	68	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
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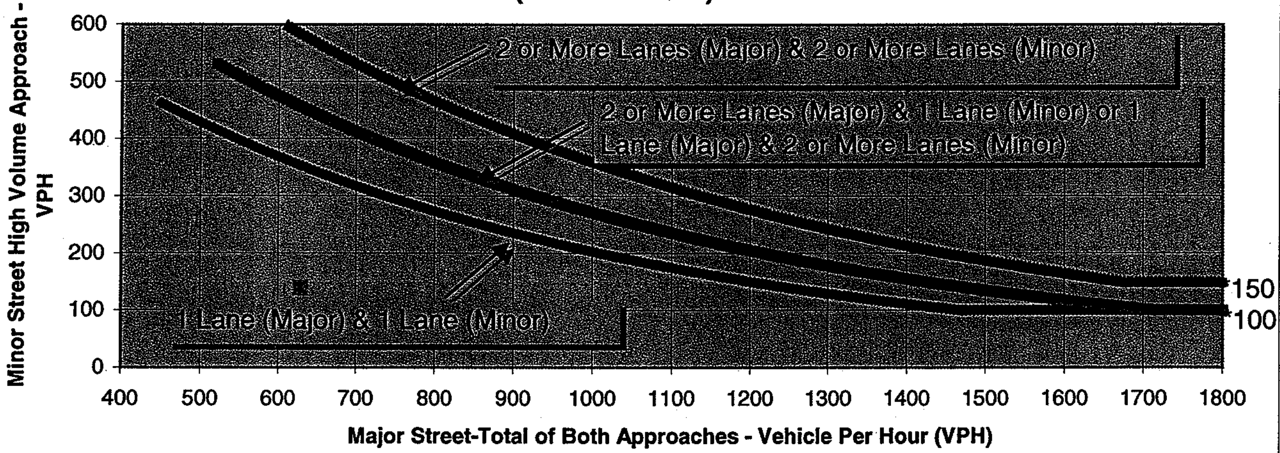
(Urban Areas)



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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		628	140	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
PEAK HOUR VOLUME WARRANT
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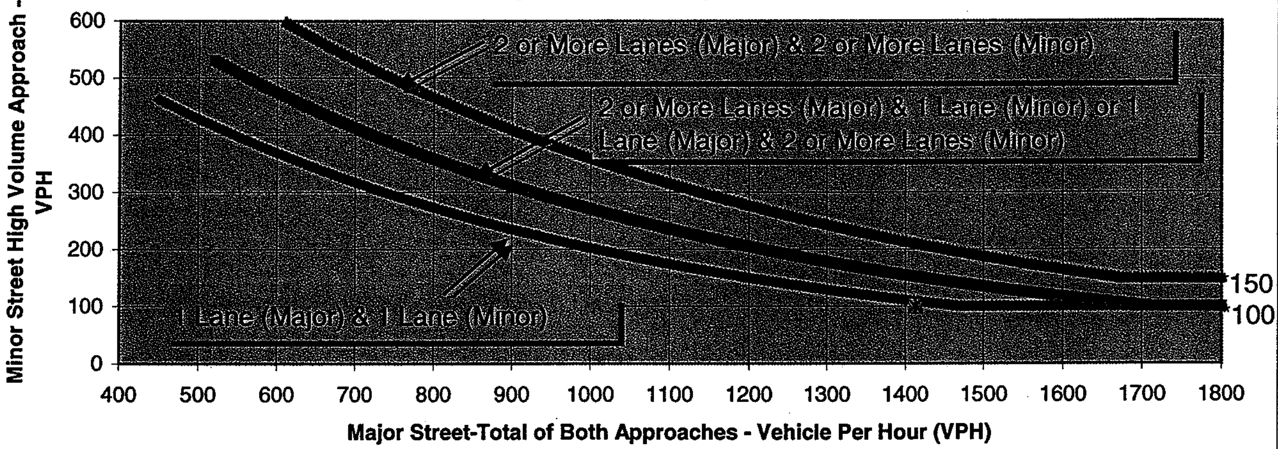

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1412	100	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☑ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
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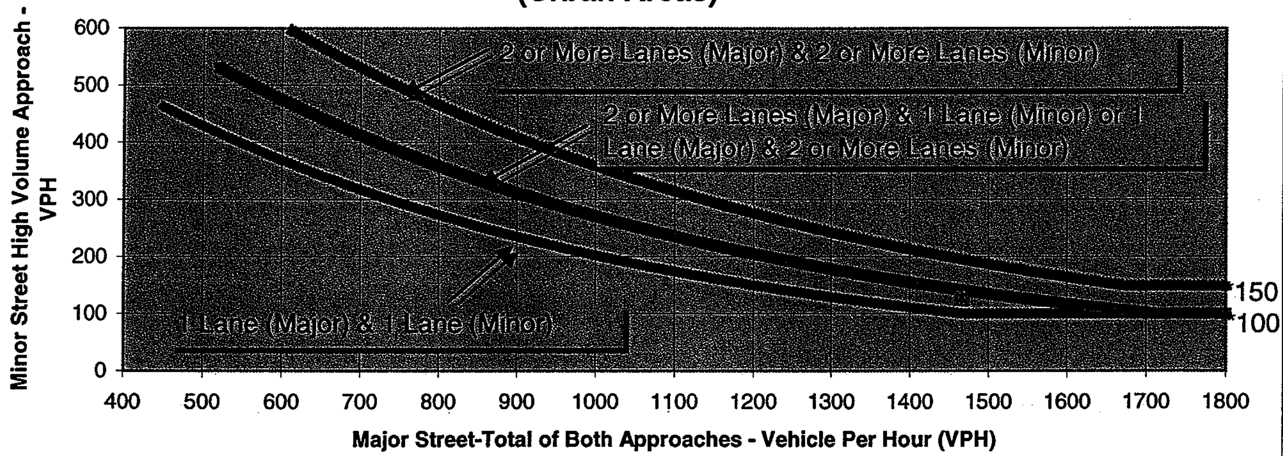

*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1466	127	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [ ] Existing Conditions
- [ ] Existing Plus Project Conditions
- [x] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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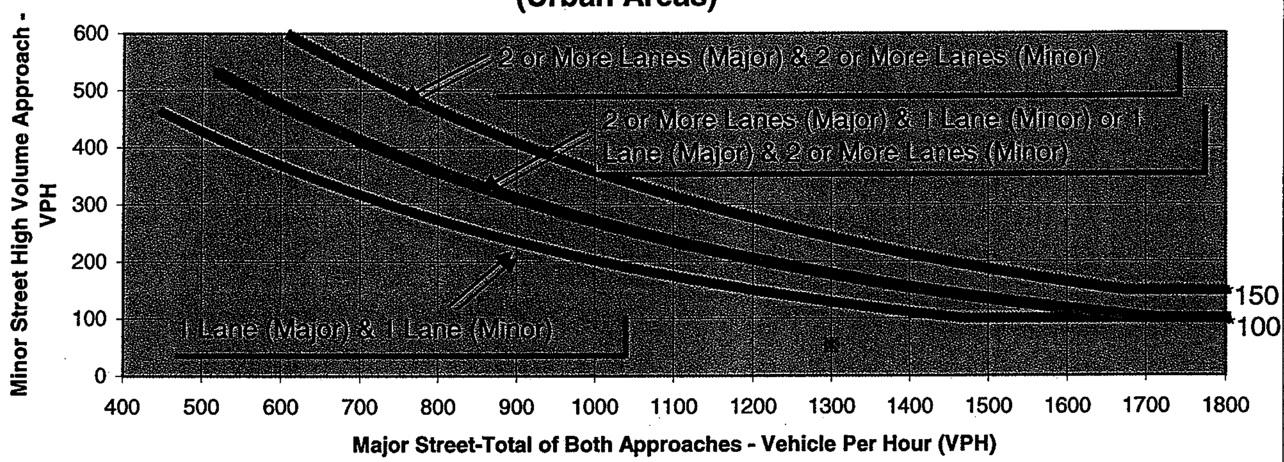
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1300	54	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☑ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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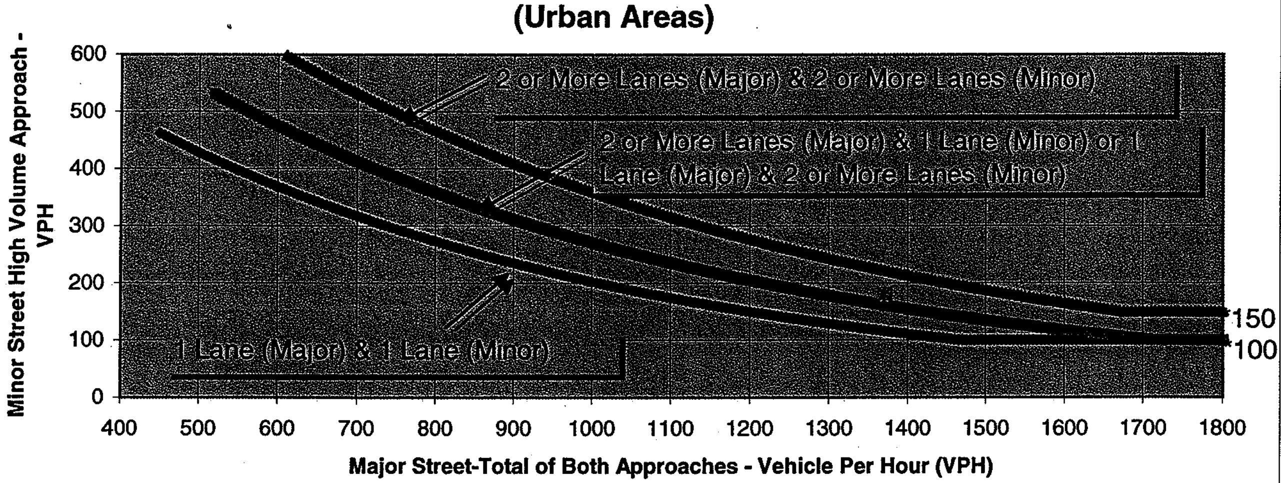

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	YES
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1370	180	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☑ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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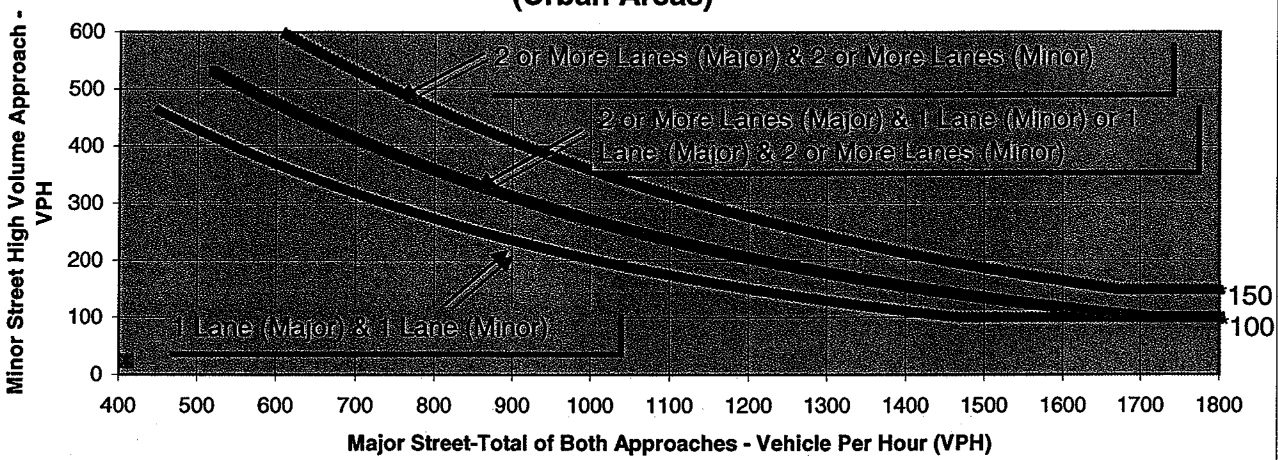
Figure 9-8
PEAK HOUR VOLUME WARRANT
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		410	25	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☑ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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				Project No	SA05-0032 Page No
				Subject	9. Arroyo Vista Dr./Wyndham Dr.
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Checked by		Date			PM Peak Hour Traffic Volume
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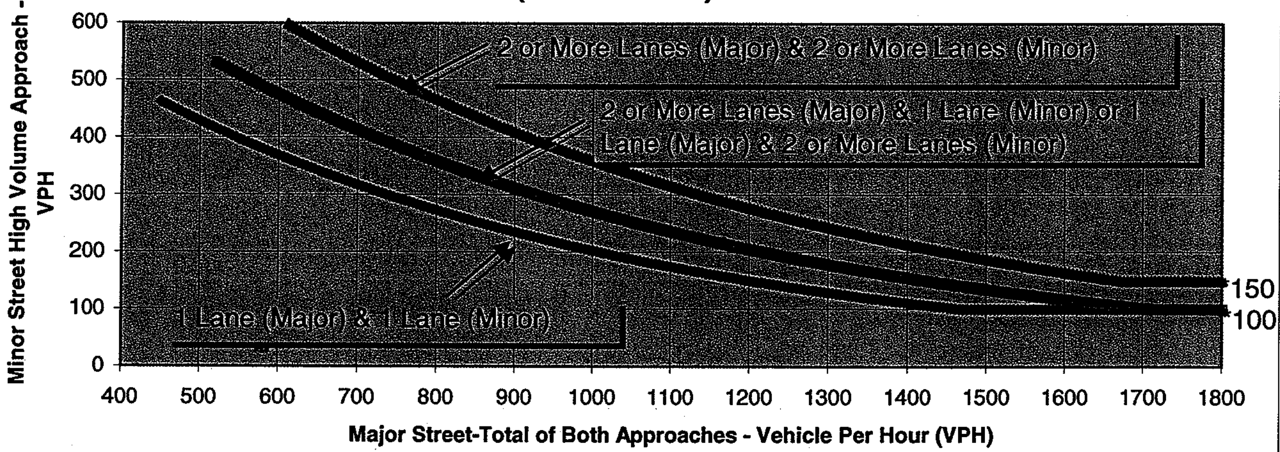
(Urban Areas)



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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		580	37	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☑ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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				Subject	10. Kaiser Access/Wyndham Dr.
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Checked by		Date			AM Peak Hour Traffic Volume
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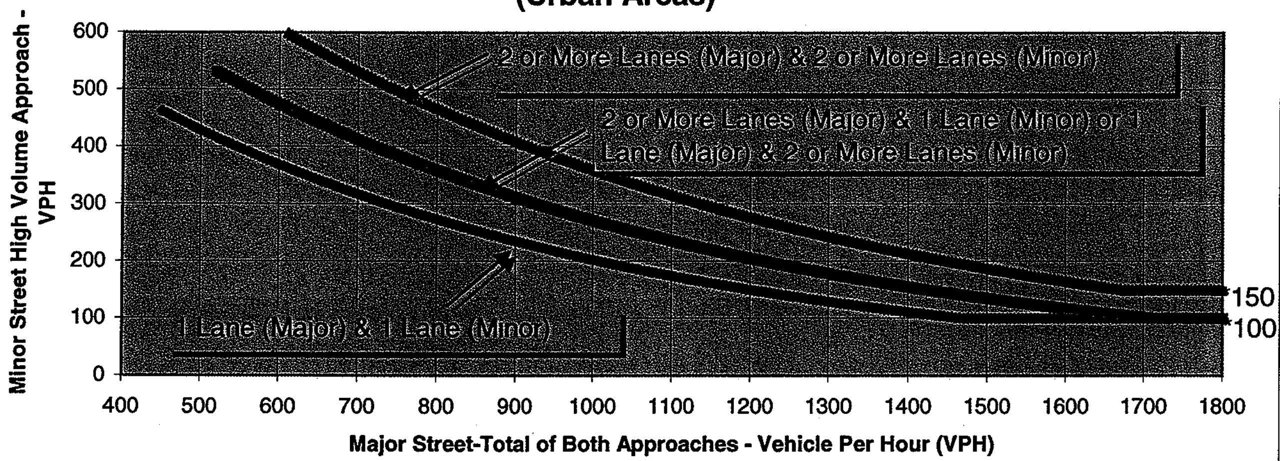
(Urban Areas)



*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		520	60	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [ ] Existing Conditions
- [ ] Existing Plus Project Conditions
- [x] Cumulative No Project Conditions
- [ ] Cumulative Plus Project Conditions

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				Project No	SA05-0032 Page No
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Figure 9-8
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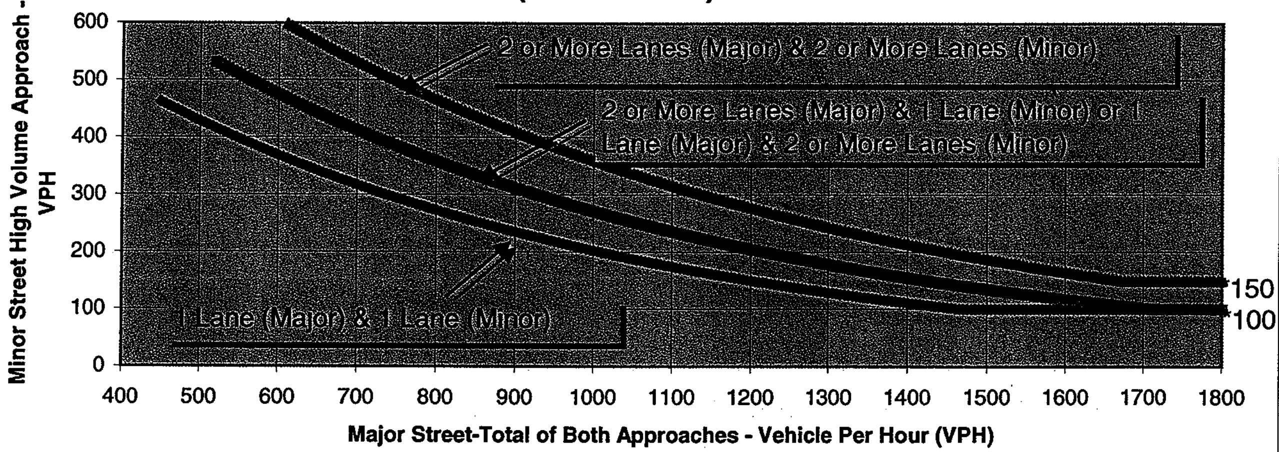

*Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.
Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		510	90	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☑ Cumulative No Project Conditions
- ☐ Cumulative Plus Project Conditions

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Figure 9-8
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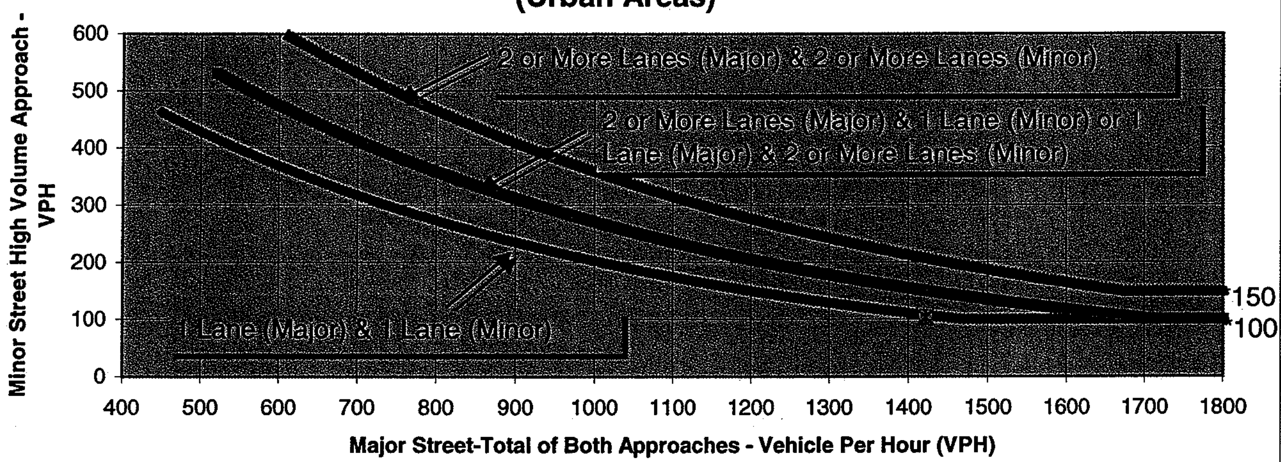

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1422	103	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [ ] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [x] Cumulative Plus Project Conditions

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Figure 9-8
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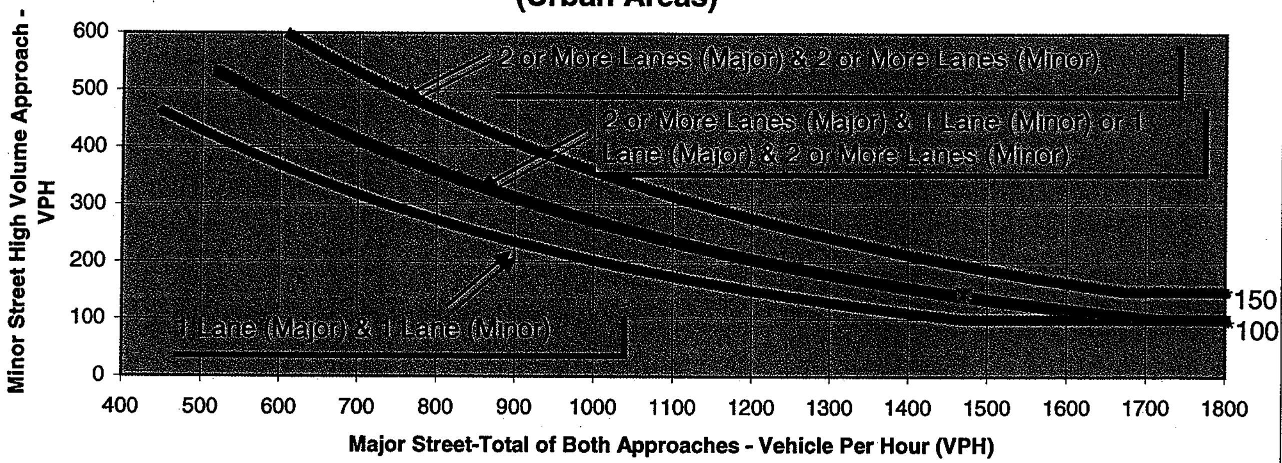

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	YES
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1471	144	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [ ] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [x] Cumulative Plus Project Conditions

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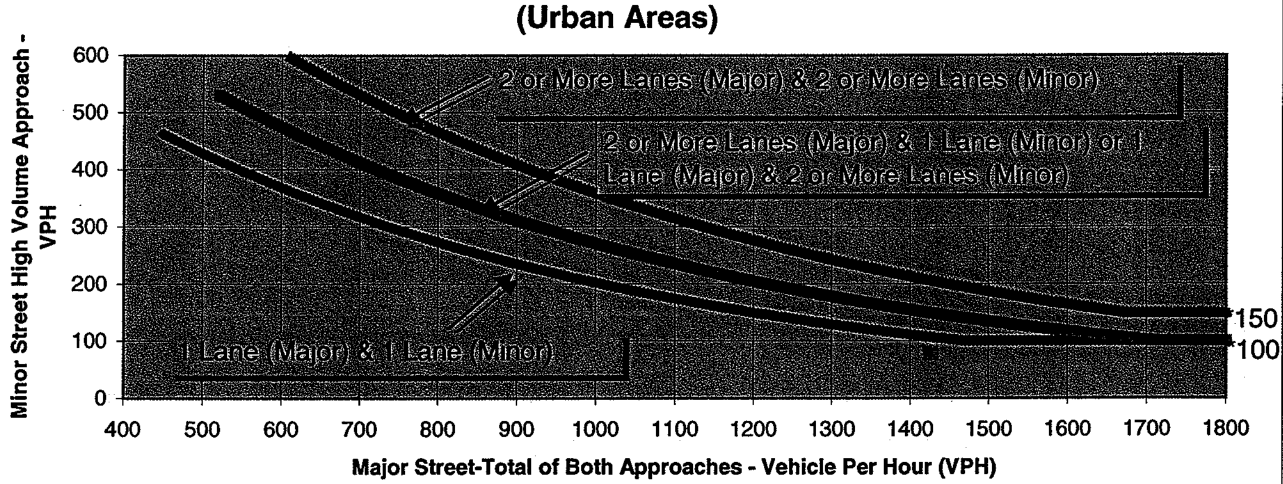

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	NO
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1426	80	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [ ] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [x] Cumulative Plus Project Conditions

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Figure 9-8
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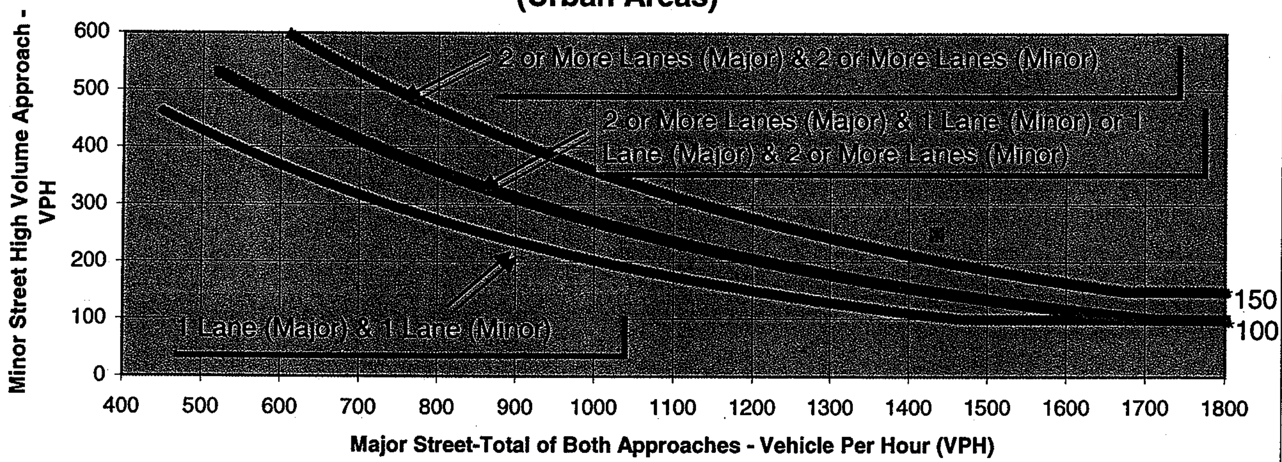

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	y	n	**YES**
	One Lane (Y/N)	n	y	
Traffic Volume (VPH) *		1435	250	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- [ ] Existing Conditions
- [ ] Existing Plus Project Conditions
- [ ] Cumulative No Project Conditions
- [x] Cumulative Plus Project Conditions

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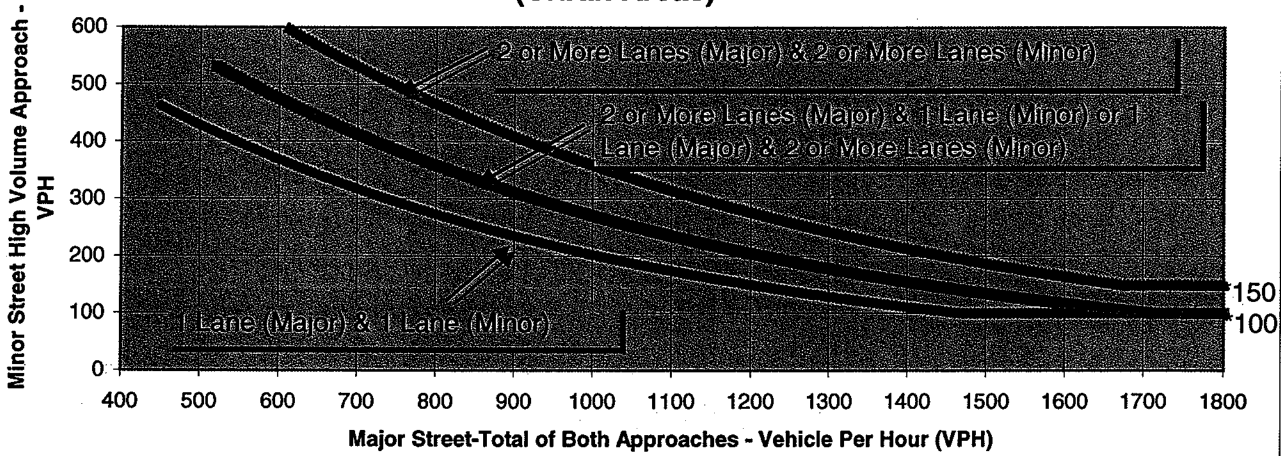
(Urban Areas)



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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		555	83	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☑ Cumulative Plus Project Conditions

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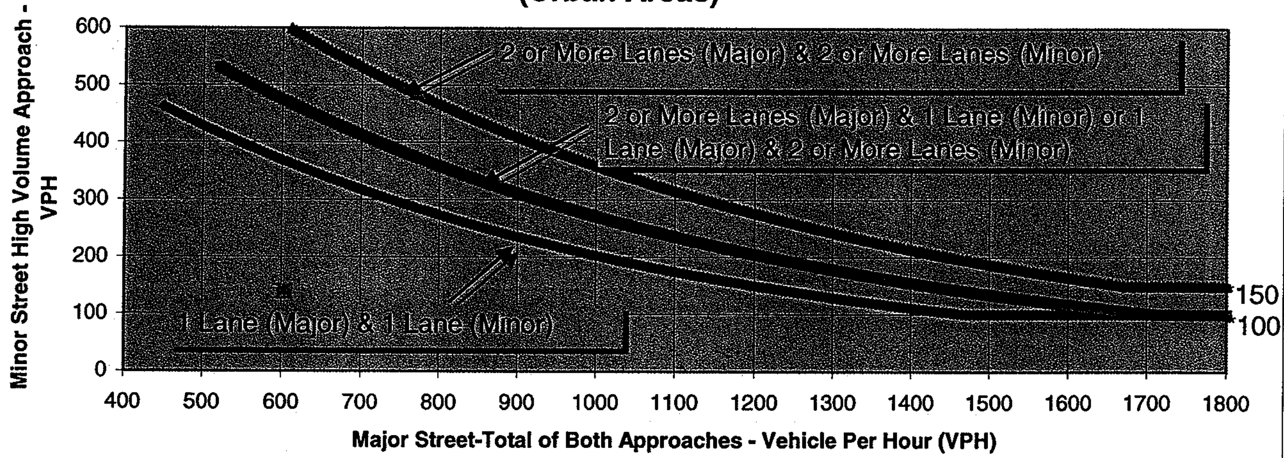

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Source: Traffic Manual, Caltrans 1996.

Name of Street		Major Street	Minor Street	Warrant Met
Number of Lanes	Two or More Lane (Y/N)	n	n	NO
	One Lane (Y/N)	y	y	
Traffic Volume (VPH) *		603	140	

*Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

- ☐ Existing Conditions
- ☐ Existing Plus Project Conditions
- ☐ Cumulative No Project Conditions
- ☑ Cumulative Plus Project Conditions

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