

VILLAGE OF MARBLE VALLEY SPECIFIC PLAN PARTIAL RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT

STATE CLEARINGHOUSE #2013022043

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Acronyms and Abbreviations

Term	Definition
CEQA	California Environmental Quality Act
CDFW	California Department of Fish and Wildlife
CPCSD	Cameron Park Community Services District
CSD	Community Services District
CSD Assessment	Cameron Park Community Services District and El Dorado Hills Community Services District Parks and Recreation Facilities Demand Assessment
DEIR	draft environmental impact report
EDHCSD	El Dorado Hills Community Services District
ESA	Endangered Species Act
EVA	Emergency Vehicle Access
Lotusland	People of the State of California Ex Rel. Rob Bonta, Attorney General v. County of Lake & Lotusland Investment Holdings, Inc.
LRVSP	Lime Rock Valley Specific Plan
VMVSP	Village of Marble Valley Specific Plan

1.1 Purpose of this Document

Section 15088.5 of the California Environmental Quality Act (CEQA) Guidelines provides that all or a portion of a draft environmental impact report (DEIR) shall be recirculated for public review and comment when there is a new or more severe significant impact not analyzed in the DEIR.

“Recirculation” simply means that the public is provided an opportunity to comment on the new or revised section(s) of the DEIR. Recirculation is not required unless significant new information is being added to the DEIR. Recirculation is not required where the new information merely clarifies or amplifies or makes insignificant modifications to the DEIR.

This document is the Partial Recirculated DEIR for the Village of Marble Valley Specific Plan (VMVSP) (proposed project). As authorized under Section 15088.5(c), the revisions to the DEIR are limited to portions of the DEIR and therefore, only those portions are included in the Partial Recirculated DEIR. For that reason, the Partial Recirculated DEIR includes only those chapter(s) in which changes are being made. In addition, none of the figures in the DEIR have been changed with the exception of the Emergency Vehicle Access (EVA) figure below; therefore, figures are not included in the Partial Recirculated DEIR. This Partial Recirculated DEIR does include the following appendices: Appendix A is the Village of Marble Valley Specific Plan Transportation Impact Analysis (Fehr & Peers 2018); Appendix B is the 2024 Biological Resources Assessment for the Village of Marble Valley Specific Plan Project (ECORP 2024); Appendix C is the Cameron Park CSD (CPCSD) and El Dorado Hills CSD (EDHCSD) Parks and Recreation Facilities Demand Assessment (Michael Baker International 2025); Appendix D is the Memorandum in Response to *Lotusland* Case (Firesafe Planning, Inc. 2025); and Appendix E is the Village of Marble Valley Specific Plan – Fire Evacuation Assessment Route Modification (Fehr & Peers 2025).

In summary, the proposed project would consist of an approximately 2,341-acre project with up to 3,236 dwelling units, 475,000 square feet of commercial use, 87 acres of public facilities use, 1,284 acres of open space, 55 acres of agricultural use, and 61 acres of new road impact areas and future right-of-way. Planned improvements would take place on approximately 1,875 acres located mostly north of Deer Creek.

1.1.1 Reason for Recirculation

El Dorado County released the VMVSP DEIR for a 60-day public review period between May 1, 2024, and July 1, 2024. The VMVSP DEIR is available online at <https://www.eldoradocounty.ca.gov/Land-Use/Planning-and-Building/Planning-Division/Environmental-Impact-Report-EIR-Documents/Marble-Valley-Specific-Plan-Notice-of-Availability-of-the-DEIR>.

The VMVSP DEIR (SCH #2013022043) has been partially revised to include analysis of the Crotch bumble bee (*Bombus crotchii*) because it was added as a candidate species for state listing in 2022 and was not included in the DEIR. Also, 3 additional impacts for offsite improvement area impacts under Biological Resources were added for clarification. The *Biological Resources Assessment for the Village of Marble Valley Specific Plan* (ECORP 2024) that identified the Crotch bumble bee as a newly listed species since preparation of the prior Biological Resources Assessment is also included (Appendix B).

Additional information has been provided for recreation as it relates to the El Dorado Hills and Cameron Parks CSDs. A facilities demand assessment has been prepared and is attached as Appendix C. This additional information is included in this recirculation for public review, although the conclusions to the DEIR related to Section 3.13, *Recreation*, remain the same.

After circulation of the DEIR, a October 23, 2024 decision in *People of the State of California Ex Rel. Rob Bonta, Attorney General v. County of Lake & Lotusland Investment Holdings, Inc. (Lotusland)* held that an EIR should have provided additional explanation about the extent to which bringing new residents to a largely undeveloped project site would increase the “risk of human-caused wildfire over the existing baseline risk” ((2024)) 105 Cal.App.5th 1222, 1233). Additional analysis was completed to respond to *Lotusland* and that analysis is included in the recirculation even though the conclusions in the DEIR remain the same. A change to the project EVA routes was also made, and the analysis confirming that the conclusions in the DEIR in light of the changes to EVA routes remain the same is also included.

1.1.2 Project and DEIR Changes

With the exception of changes to the EVA routes, no changes to the VMVSP project are proposed. The changes to the DEIR contained in this Partial Recirculated DEIR are limited to 1) revising the Biological Resources section of the DEIR with regard to the Crotch bumble bee and 3 offsite improvement area impacts along with an updated *Biological Resources Assessment for the Village of Marble Valley Specific Plan* (2024); 2) the DEIR inadvertently included a draft version of the 2018 Transportation Impact Analysis (Appendix K in the DEIR), therefore, the final version of that report is included as Appendix A in this Partial Recirculated DEIR for informational purposes only; 3) additional information has been provided for recreation as it relates to the El Dorado Hills and Cameron Parks CSDs, a facilities demand assessment has been prepared and is attached as Appendix C; and 4) EVA-3 has been removed and EVA-1 improved and additional information has been included in response to *Lotusland*.

With respect to the inclusion of the 2018 Transportation Impact Analysis and as explained on page 3.6-5 of the DEIR, because level of service is no longer the metric by which traffic is assessed for purposes of CEQA, the DEIR does not analyze the project’s anticipated impact on level of service and this recirculation is not intended to consider or receive comments on level of service. The 2018 Transportation Impact Analysis is included for informational purposes only.

1.1.3 Additional Environmental Analysis

1.1.3.1 Biological Resources

The Crotch bumble bee was not included in the Biological Resources section of the DEIR; therefore, this Partial Recirculated DEIR includes impact analysis and mitigation for this species. Additionally, impact analysis and mitigation for interference with the movement of resident or migratory wildlife within the offsite improvement areas, potential conflict with the County General Plan oak protection policies within the offsite improvement areas, and potential introduction and spread of invasive plant species within the offsite improvement areas is also included to more comprehensively describe the impacts on biological resources in the offsite improvement areas in response to public comment on the DEIR. The updated *Biological Resources Assessment for the Village of Marble Valley Specific Plan* (2024) is included as Appendix B.

1.1.3.2 Hazards and Hazardous Materials

The Hazards and Hazardous Materials section of the DEIR has been updated to include additional information in response to the *Lotusland* case regarding human-caused wildfire and changes to the EVA routes, specifically replacing EVA 3 with the higher capacity connection to EVA 1 in the East Ridge Village.

1.1.3.3 Recreation

Based on comments received on the DEIR with regard to the CSDs, the County prepared the CPCSD and EDHCSD Parks and Recreation Facilities Demand Assessment. This report is summarized below and is attached as Appendix C.

1.2 Organization of the Document and Summary of Changes

The Partial Recirculated DEIR includes the following sections:

- Chapter 1, *Introduction*. This chapter discusses the purpose of this Partial Recirculated DEIR, summarizes the revisions being made to the VMVSP DEIR, the public review process, and use of this document.
- *New Information*: Section 3.3, *Biological Resources*, 3.3.2, *Environmental Impacts*, *Impact BIO-33*. These new impacts include analysis and mitigation for the Crotch bumble bee and 3 offsite improvement area impacts.
- *New Information*: Section 3.13, *Recreation*, 3.13.2, *Environmental Impacts*, *Impact REC-1*. Additional information with regard to the CPCSD and EDHCSD has been incorporated.
- *Revised*: Chapter 7, *References*. This includes new references cited in the Partial Recirculated DEIR that are not included in Chapter 7, *References*, of the DEIR.

- *Appendices.* Appendix A includes the final version of the 2018 Transportation Impact Analysis (Appendix K in the DEIR). Appendix B includes the 2024 *Biological Resources Assessment for the Village of Marble Valley Specific Plan*. Appendix C includes the CPCSD and EDHCSA Parks and Recreation Facilities Demand Assessment. Appendix D includes the memorandum in response to the *Lotusland* case. Appendix E includes the *Village of Marble Valley Specific Plan – Fire Evacuation Assessment Route Modification*.

1.3 Public Review Process

The Partial Recirculated DEIR will be available for a 60-day public review period. The Partial Recirculated DEIR was circulated to state agencies for review through the State Clearinghouse of the Governor’s Office of Planning and Research. Copies of the Partial Recirculated DEIR are available for public review on the County’s website (<https://www.edcgov.us/Planning/>); at the El Dorado Hills Library, 7455 Silva Valley Parkway, El Dorado Hills; the Placerville Library, 345 Fair Lane, Placerville; and during normal business hours at the public counter at the Community Development Agency, 2850 Fairlane Court, Building C, Placerville.

Written comments can be submitted by mail to:

Mr. Cameron Welch
El Dorado County, Planning and Building Department
2850 Fairlane Court, Building C
Placerville, CA 95667

Written comments can be submitted by email to: VMVSP@edcgov.us.

1.3.1 Limitation on Comments

State CEQA Guidelines Section 15088.5(f)(2) states that:

When the EIR is revised only in part and the lead agency is recirculating only the revised chapters or portions of the EIR, the lead agency may request that reviewers limit their comments to the revised chapters or portions of the recirculated EIR. The lead agency need only respond to (i) comments received during the initial circulation period that relate to chapters or portions of the document that were not revised and recirculated, and (ii) comments received during the recirculation period that relate to the chapters or portions of the earlier EIR that were revised and recirculated. The lead agency’s request that reviewers limit the scope of their comments shall be included either within the text of the revised EIR or by an attachment to the revised EIR.

In keeping with this provision, **El Dorado County requests that commenters limit their written comments to the revisions and new material presented in the Partial Recirculated DEIR, which consists only of the new information included in this Partial Recirculated DEIR for Section 3.3, *Biological Resources*, 3.3.2, *Environmental Impacts*; Section 3.7, *Hazards and Hazardous Materials*, 3.7.2, *Environmental Impacts (EVAs and Wildfire)*; and Section 3.13, *Recreation*, 3.13.2, *Environmental Impacts*.** The Final EIR will include written responses to the comments submitted on the portions of the previously circulated DEIR that have not been recirculated, as well as the comments received on the Partial Recirculated DEIR.

1.4 Use of this Document

The Partial Recirculated DEIR will be combined with the previously circulated DEIR as part of the Final EIR. The Final EIR will also include the comments received on the un-recirculated portions of the DEIR and the Partial Recirculated DEIR, along with written responses to those comments.

The Board of Supervisors will consider certification of the Final EIR prior to completing its deliberations on the project. If it approves the project, then the Board will adopt the findings, statement of overriding considerations, and mitigation monitoring and reporting program that are required by CEQA.

The Partial Recirculated DEIR is not the Final EIR. The Final EIR will include other revisions and clarifications (i.e., an errata chapter) in response to the comments received on the DEIR and the Partial Recirculated DEIR, or as needed to otherwise clarify the Final EIR.

3.3 Biological Resources

Section 3.3, Biological Resources, 3.3.2 Environmental Impacts has been updated to include impact analysis and mitigation for the Crotch bumble bee which is now a candidate “species” and 3 offsite improvement area impacts. The 3 offsite improvement area impacts are included to address comments received on the DEIR and to provide more detailed information about potential offsite improvement area impacts. New text is underlined and deleted text in ~~striketrough~~.

The following impacts and mitigation measures are added to page 3.3-82 of the DEIR following Mitigation Measure BIO-14.

3.3.2 Environmental Impacts

Impacts and Mitigation Measures

Impact BIO-33: Potential Mortality or Disturbance of Crotch Bumble Bee within VMVSP Project Area (less than significant with mitigation)

The Crotch bumble bee was determined to be a candidate species for state listing in 2022, after previous field studies were conducted onsite. Consequently, Crotch bumble bee was not included in any target lists for field surveys. It is included in the 2024 BRA prepared by ECORP (ECORP 2024). An impact discussion and avoidance and minimization measures for potential effects on Crotch bumble bee were not included in the DEIR but are included below.

Up to 153.4 acres of annual grassland, 689.6 acres of existing oak woodlands, 138.1 acres of chaparral, and 4.8 acres of riparian woodland habitat, some of which could support Crotch bumble bee overwintering, nesting, and foraging habitat, would be converted to urban uses during project construction. If Crotch bumble bee is present in the project area during construction, clearing and grubbing, excavation, and other construction activities could result in mortality of adults or larvae from being crushed or buried by equipment. Adult Crotch bumble bees could be struck by vehicles and construction equipment traveling along access roads during construction if they are foraging or flying through the area. Construction could also disrupt nesting or foraging activities. Because Crotch bumble bees are a state candidate for listing, this impact would be significant.

As described under Impact BIO-1, the project applicant would implement general protection measures for biological resources, including Mitigation Measures BIO-1a, BIO-1b, and BIO-1c, which require barriers to protect sensitive Crotch bumble bee habitat as determined by the biological monitor prior to construction, environmental awareness training for construction employees, and periodic site visits during construction. Mitigation Measure BIO-1d avoids and minimizes potential disturbances of oak woodland, Mitigation Measure BIO-2 compensates for the permanent loss of riparian woodland, and Mitigation Measure BIO-33 would minimize impacts on Crotch bumble bee individuals. With implementation of these mitigation measures the impact would be less than significant.

Mitigation Measure BIO-33: Conduct preconstruction surveys and implement Crotch bumble bee avoidance and minimization measures.

If the Crotch bumble bee is a Candidate or formally Listed species under the California Endangered Species Act (ESA) at the time vegetation- or ground-disturbing activities occur, the following shall apply:

In accordance with the Survey Considerations for California ESA Candidate Bumble Bee Species (CDFW 2023), the applicant shall conduct 2 onsite surveys prior to construction of each phase and during the colony active period for Crotch's bumble bee (April–August) when detection probability is the highest and floral resources are in bloom. Space the surveys 2–4 weeks apart to ensure that they cover a range of dates and account for variability in resource use by the candidate species and floral resource phenology within the site. Survey methods and best practices shall follow California Department of Fish and Wildlife (CDFW) guidelines (CDFW 2023).

If the Crotch bumble bee is a Candidate or formally Listed species under the California ESA at the time vegetation- or ground-disturbing activities occur, the following shall apply: :

- Specifications for construction timing and sequencing requirements (e.g., avoidance of raking, mowing, tilling, or other ground disturbance until late March to protect overwintering queens);
- A requirement for a preconstruction survey to be conducted prior to the start of ground-disturbing activities to identify active nests;
- Establishment of no-disturbance buffers for nest sites determined by a qualified biologist as adequate to avoid any disturbance to the nest site or an accidental take and construction monitoring by a qualified biologist to ensure compliance;
- Restrictions associated with construction practices, equipment, or materials that may harm bumble bees as determined by a qualified biologist (e.g., avoidance of pesticides/herbicides, best management practices to minimize the spread of invasive plant species);
- Provisions to avoid Crotch's bumble bees or potential Crotch's bumble bees if observed away from a nest during project activities (i.e., ceasing of project activities until the animal has left the work area of its own volition); and
- Prescription of an appropriate restoration seed mix identified by a qualified biologist that is targeted for the Crotch's bumble bee and the Sierra Nevada foothills, including native plant species known to be visited by native bumble bee species and containing a mix of flowering plant species with continual floral availability through the entire active season of the Crotch's bumble bee (March to October). The seed mix should be applied to temporarily disturbed areas within annual grasslands and oak savanna on the project site.

Impact BIO-34: Interfere with the movement of resident or migratory wildlife within the offsite improvement areas (less than significant with mitigation)

The types of impacts on wildlife movement from the construction of the offsite improvement areas would be similar to those described above under Impact BIO-15 but impacts would be of a lesser magnitude. Protection of open space lands, compensation for the loss of oak woodland habitat, and implementation of Mitigation Measure BIO-1d would reduce indirect impacts on the movement of resident and migratory wildlife. Furthermore, County Code Section 9.46.600 requires dogs and other domestic animals to be on a leash, which would also apply in the offsite improvement areas. Because the construction of the offsite improvement areas would avoid and minimize impacts on resident and migratory wildlife and their habitat, it would not substantially reduce the habitat of a wildlife species, cause a wildlife population to drop below self-sustaining levels, threaten to eliminate an animal community, or reduce the number or restrict the range of a rare or endangered animal. Therefore, the offsite improvement areas would have a less-than-significant impact on movement of resident and migratory wildlife.

Mitigation Measure BIO-1d: Avoid and minimize potential disturbance of oak woodland habitat and compensate for loss of oak woodland and individual trees

Impact BIO-35: Potential conflict with the County General Plan oak protection policies within the offsite improvement areas (less than significant with mitigation)

The impacts related to potential conflict with the County General Plan oak protection policies from the construction of the offsite improvement areas would be similar to those described above under Impact BIO-16, but impacts would be of a lesser magnitude because a maximum of 3.5 acres of oak woodland would be removed in the offsite improvement areas. With implementation of Mitigation Measures BIO-1d and BIO-18, the project would not conflict with the 2017 ORMP, and this impact would be less than significant. Implementation of Mitigation Measures BIO-1a, BIO-1b, and BIO-1c would further reduce impacts on oak woodland in the offsite improvement areas by requiring barriers to protect sensitive areas, environmental awareness training for construction employees, periodic site visits during construction, avoidance or minimization of construction disturbance on retained oak woodland, and maintaining retained oaks.

Mitigation Measure BIO-1a: Install construction barriers around the construction area to protect sensitive biological resources to be avoided

Mitigation Measure BIO-1b: Conduct environmental awareness training for construction employees

Mitigation Measure BIO-1c: Conduct periodic site visits during construction

Mitigation Measure BIO-1d: Avoid and minimize potential disturbance of oak woodland habitat and compensate for loss of oak woodland and individual trees

Mitigation Measure BIO-18: Compensate for loss of oak woodland in offsite infrastructure improvement areas

Impact BIO-36: Potential introduction and spread of invasive plant species within the offsite improvement areas (less than significant with mitigation)

The impacts related to potential introduction and spread of invasive plant species from the construction of the offsite improvement areas would be similar to those described above under Impact BIO-17. Implementation of Mitigation Measure BIO-17 during construction in the offsite improvement areas would reduce this impact to a less-than-significant level.

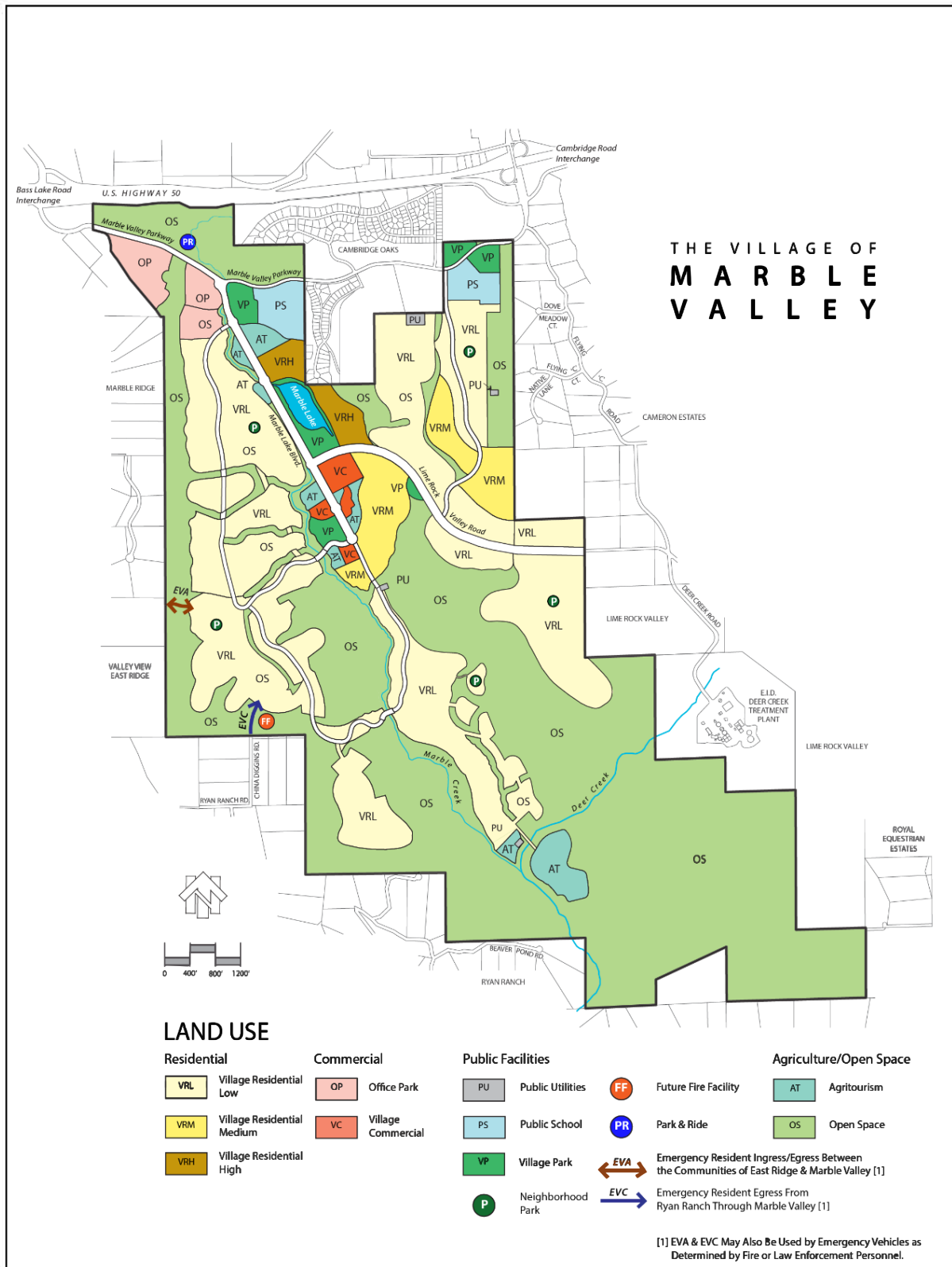
Mitigation Measure BIO-17: Minimize the introduction and spread of invasive plants

3.7 Hazards and Hazardous Materials

Section 3.7, Hazards and Hazardous Materials, has been updated to include additional information in response to the Lotusland case regarding human-caused wildfire and changes to the EVA routes. The less-than-significant impact conclusion in Impact HAZ-8 is unchanged from the DEIR. New text is underlined and deleted text is in ~~strikethrough~~.

The following additional text for Impact HAZ-8 is added to page 3.7-24 of the DEIR between the third and fourth paragraphs.

Since circulation of the DEIR, the emergency access for VMVSP was updated in light of the construction of the East Ridge Village project that began in 2024. Now that construction of East Ridge Village is occurring, it is reasonable to assume an emergency access connection between the VMVSP and East Ridge Village at EVA 1, since the EVA connection is included in the Valley View Specific Plan East Ridge Village (Amendment B) Wildland Fire Safe Plan (CDS Fire Prevention Planning 2015. Additionally, what was previously EVA 3 connecting to Ryan Ranch has been changed to an Emergency Vehicle Connection providing only emergency access for emergency personnel to Ryan Ranch from VMVSP. Residents of VMVSP will not use the Emergency Vehicle Connection for evacuation purposes. The Village of Marble Valley Specific Plan – Fire Evacuation Assessment Route Modification (Appendix E; Fehr & Peers 2025) concludes that replacing EVA 3 with the higher capacity connection to EVA 1 and the East Ridge Village will result in improved evacuation conditions for VMVSP, relative to the conditions analyzed in Impact HAZ-8, and the impact would remain less than significant. The revised EVA 1 and replacement of EVA 3 with the Emergency Vehicle Connection are depicted below.



Torrence Planning
February 2025

After the DEIR was circulated, a decision in *People of the State of California Ex Rel. Rob Bonta, Attorney General v. County of Lake & Lotusland Investment Holdings, Inc.* (2024) 105 Cal.App.5th 1222 (*Lotusland*) was reached on October 23, 2024. In *Lotusland*, the appellate court faulted the EIR for not explaining the extent to which bringing new residents to the largely undeveloped project site would increase the “risk of human-caused wildfire over the existing baseline risk” (*Id.* at p. 1233). The court also explained that if quantifying the risk is not possible, the “EIR itself must explain why, in a manner reasonably calculated to inform the public of the scope of what is and is not yet known about the Project’s impacts” (*Id.* at fn. 8).

While the DEIR for the VMVSP explained that most wildfires are caused by people and increasing people in the area would expose those new residents and the surrounding community to potential wildfire risk, the DEIR did not, as in *Lotusland*, attempt to quantify the increased risk of human-caused wildfires as a result of the increased population from development of the project. The Memorandum in Response to *Lotusland* Case in Appendix D was prepared in an effort to quantify the risk to the extent possible (Firesafe Planning, Inc. 2025).

The Memorandum in Response to *Lotusland* Case concludes that, while the project increases the general potential for human-ignited wildfires as disclosed in the DEIR, there is not a direct or linear correlation between increased population and wildfire that can be precisely calculated. Studies discussed in the Memorandum in Response to *Lotusland* Case have determined that, at a certain point, increased density in terms of units per acre and population combined with development under current standards begins to actually minimize the risks of wildfires even though the population has increased. Studies discussed therein have also shown that construction under current standards reduces the threat of wildfire and communities built after 2008 face less wildfire risk. After considering available data regarding human causes of wildfires and historical data of wildfires in the project area from 2000 to 2023 and the system’s approach to reducing wildfire risks and severity, the Memorandum in Response to *Lotusland* Case concludes that population does not appear to be a significant driving force to wildland fires and per capita rates suggest that population density may reduce the ignition rate per capita, even if it increases the total number of fires overall. The Memorandum in Response to *Lotusland* Case ultimately concludes that the addition of new residents and people to the undeveloped project site will have a less-than-significant impact on the increase of wildfires from human-caused wildfire over the existing baseline risk.

The Memorandum in Response to *Lotusland* Case also explains that the wildfire safety plan implemented through Mitigation Measure HAZ-8 and approved at each small lot tentative subdivision map will include measures to reduce the risks of wildfire from humans based on the most current standards at the time of the tentative map. This will ensure that the most current standards, which are expected to become more stringent over time, are adopted and the wildfire safety plan is able to address the layout of each tentative map. While the wildfire safety plan would address all of the human-causes herein and apply the most current stringent standards, to provide further assurances at this programmatic stage, Mitigation Measure HAZ-8 is amended to include minimums that would expressly address wildfires caused by humans. Mitigation Measure HAZ-8 is therefore amended as follows:

Mitigation Measure HAZ-8: Preparation of a wildfire safety plan

Prior to ~~the submittal of the first~~ approval of a small lot tentative subdivision map, the County will require a ~~the preparation of a~~ wildfire safety plan reviewed and approved by CAL FIRE and the local fire protection district that is appropriate to the high and very high fire classifications of the plan area on the CAL FIRE Hazard Severity Zone Map for El Dorado County. The wildfire safety plan will include, but not be limited to, the following.

- *Site and project description*
- *Applicable codes and regulations*
- *Fire department response capabilities*
- *Site fire risk assessment (weather, fuels, topography, fire and ignition history, and potential fire behavior)*
- *Fire safety requirements (vegetation management, structural hardening site access, water availability, alternative materials and methods)*
- *Response strategies for emergency evacuations related to wildfire (number of people using routes; accessibility of routes; any disruptions to routes from natural hazards; and location and capacity of emergency shelters), including written proof of legal access rights to use any routes on private roads for required EVAs, which may be in the form of a recorded easement or recorded agreement with the private property owner or private homeowners or road association*
- *Frequency of fuel management*
- *Prohibition of smoking in public open space areas*
- *Ban of solid fuel outdoor fires within the community without spark arrestor and only in approved devices*
- *No open burning in the fuel modification zones, open space or within 50 feet of the wildland interface*
- *Adoption/application of the most current regulations and standards regarding the type and nature of equipment utilized in open space areas*
- *Sites with wildland fuels below (lower than the project structures) must have additional protections provided that is equal to or greater than the risk associated with the configuration, as approved by the fire authority having jurisdiction. This may include radiant heat walls, increased built-in fire protection features and/or placement of the structure so that the impacts of “underslung fuels” are addressed.*
- *Structures and features shall be sited to maximize the role of low-flammability landscape features and roadways that may buffer the development from fire spread as required by 14 CCR Section 1276.03(Fuel Breaks)*
- *Funding source*

3.13 Recreation

Section 3.13, Recreation, 3.13.2, Environmental Impacts, Impact REC-1 has been updated to include additional background information to the results of a CSD park demand assessment prepared by the County. The less-than-significant impact conclusion is unchanged from the DEIR. New text is underlined and deleted text in ~~strikethrough~~.

The following text is added to page 3.13-11 of the DEIR following Policy 7.23.

Impact REC-1: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated (less than significant)

The County prepared the Cameron Park Community Services District and El Dorado Hills Community Services District Parks and Recreation Facilities Demand Assessment (CSD Assessment) documenting the results of the CPCSD and EDHCSD parks and recreation facilities demand assessment (Appendix C; Michael Baker International 2025). The CSD Assessment, which evaluates the potential demand on parks and recreation facilities in the CPCSD and EDHCSD resulting from development of the proposed specific plans, was initiated by and is under the direction of the El Dorado County Planning and Building Department.

The VMVSP and LRVSP would increase the residential population in the vicinity of CPCSD and EDHCSD. Each project will include public park facilities that would be available to residents within the specific plans, but the parks would also be available to the population outside the project areas. The VMVSP is within the boundary of the EDHCSD. The number of potential future park and facility users from both specific plan areas who would visit existing CPCSD and EDHCSD parks as well as those who might use park facilities provided by each specific plan, at buildout, were estimated using a “gravity model.”

Existing demand on CPCSD and EDHCSD facilities was estimated by the EDHCSD using Placer Labs, Inc. artificial intelligence software platform. The data show that, as expected, most of the demand within each CSD is from residents in those districts, and there is also cross-district use. However, there is also visitation from the population outside both district boundaries (e.g., Folsom and the greater Sacramento region and beyond). When the results of the existing demand are combined with projected demand using the gravity model, it is reasonable to assume such trends would continue into the future and that visitors would continue travel to parks and facilities that best meet their needs, even if there are parks closer to them. The results of the assessment suggest that there would be a range of potential demand on the CPCSD and EDHCSD from the VMVSP. Based on available information, precise quantification of potential population demand on the CPCSD and the EDHCSD facilities resulting from the VMVSP is not possible at this time because: 1) the planned parks in the specific plans would not be designed until after tentative maps are approved, which would only occur after project approvals, so the specific amenities that would be provided in the planned parks of the specific plans are currently unknown; 2) while the Placer.ai software can be used to generate visitor data for existing conditions, its usefulness for predicting future visits is constrained because the specific plan areas are not developed. There is no “real-time” trip origin and destination visitor trip data; and 3) the data indicate cross-district and non-resident use, including a substantial

number of visits to the CPCSD and EDHCSD from locations not within the districts. Thus, the projections using the gravity model must be viewed in conjunction with the Placer.ai datasets.

Using a gravity model described in the CSD Assessment (Appendix C: Table 5), it is estimated that 85% of annual park user visits by VMVSP residents would use parks within VMVSP, which would be EDHCSD parks. The CSD Assessment also estimates that approximately 9% of annual park user visits by VMVSP residents would be to existing EDHCSD parks. Since VMVSP parks would become EDHCSD parks, the gravity model estimates that approximately 94% of annual park trips by VMVSP residents will be to EDHCSD parks. This park visitation preference by project residents is expected given the project site design where roadway access out of the site would pass the proposed village park sites along Lime Rock Valley Road, Marble Lake Road, and Marble Valley Parkway. This travel pattern would direct project residents into the EDHCSD. In contrast, longer travel would be required to use CPCSD park facilities.

The CSD Assessment recognizes that anticipated park use cannot be precisely calculated and the gravity model does not account for all amenities that may attract a user to a park. Additionally, the gravity model may overestimate the buildout projection percentage for parks within the specific plans and the demand for existing EDHCSD and CPCSD could be greater if the specific plan parks do not offer similar amenities, especially sports/special use fields. Combined with the Placer Labs, Inc. data provided by the EDHCSD, the data on actual park usage by current residents and the gravity model together show that residents use parks close to their homes and also travel to other areas outside of their park district to use parks. As the Placer Labs, Inc. data shows, residents of EDHCSD use CPCSD parks and residents of CPCSD use EDHCSD parks. This use across park district lines would be anticipated to equalize demands on parks with each district serving residents of the other district while also having less residents to serve when those residents use a park outside of the resident's district.

The CSD Assessment further estimates that, with the addition of VMVSP parks that would be available to CPCSD residents, visits to CPCSD parks could decrease after buildout of the VMVSP parks. With the addition of new EDHCSD parks in VMVSP and cross-district park usage, the new residents of VMVSP are therefore not anticipated to cause such a significant increase in the use of existing neighborhood and regional parks or other recreational facilities in EDHCSD or CPCSD such that substantial physical deterioration of the facility would occur or be accelerated. It is acknowledged in the CSD Assessment that there is high visitation on park and recreation facilities of regional interest (e.g., pool facilities, community centers, and parks with sports fields) in both CSDs that the project would contribute additional visitation. Both CSD control access to these facilities charge user fees and/or rental fees to fund operation and maintenance. The EDHCSD and CPCSD maintain the ability to control use of these regional recreation facilities and address deterioration due to usage.

Development of the VMVSP would be subject to EDHCSD park impact fees pursuant to the "Mitigation Fee Act" as found in Government Code Section 66000 and El Dorado County Code Chapter 13.20 (Development Impact Fees for Special Districts), which ensures that fees charged have a reasonable relationship or nexus between new development and the need for additional park and recreational facilities within the CSD as a result of new development. These fees are \$13,495 per single-family dwelling unit, \$8,907 per multifamily or affordable dwelling unit, and \$7,886 per age-restricted dwelling unit for EDHCSD.

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Appendix A
**Village of Marble Valley Specific Plan
Transportation Impact Analysis**

Village of Marble Valley Specific Plan Transportation Impact Analysis

Prepared for:
County of El Dorado

March 2018

RS12-3016

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1.0 INTRODUCTION

1.1 REPORT OVERVIEW

This study presents the results of a transportation impact analysis completed for the Village of Marble Valley Specific Plan (VMVSP) (project) in El Dorado Hills, California, which is an unincorporated area of El Dorado County (County). The project area is approximately 1,000 feet southeast of the US 50 / Bass Lake Road interchange and is surrounded by the Cambridge Oaks residential development and US 50 to the north; Marble Ridge residential development and Valley View Specific Plan area to the west; Ryan Ranch residential development to the southwest; Sun Ridge Systems to the south; and Cameron Estates, the proposed Lime Rock Valley Specific Plan, Deer Creek Wastewater Treatment Plant, and Royal Equestrian Estates to the east.

The purpose of this impact analysis is to identify potential environmental impacts to transportation facilities as required by the California Environmental Quality Act (CEQA). This study was performed in accordance with the El Dorado County Community Development Agency's *Transportation Impact Study Guidelines*, and the scope of work developed in collaboration with County staff and Caltrans.

The remaining sections of this report document the proposed project, analysis methodologies, impacts and mitigations.

1.2 PROJECT DESCRIPTION

The proposed VMVSP includes the development of 3,236 dwelling units, 87 acres of public facility / recreational use, 475,000 square feet of commercial use, 35 acres for two public schools (K5 / K8), 1,284 acres of open space, 55 acres of agricultural use, and 61 acres of new road impact areas and future right-of-way. Planned improvements are proposed for 1,875 acres of the 2,341-acre site. Most of the development would occur north of Deer Creek. The proposed project expands the Community Region of El Dorado Hills to include the VMVSP area. Figure 1, adapted from the project's *Notice of Preparation of a Draft Environmental Impact Report*, provides an overview of the proposed project and internal roadway network to support proposed land uses.

US 50 access will be through the US 50 / Bass Lake Road and US 50 / Cambridge Road interchanges. Marble Valley Parkway is proposed as a continuous roadway connecting the Bass Lake Road and Cambridge Road interchanges. A portion of Marble Valley Parkway is outside the plan area. Marble Lake Boulevard, which is planned as a four- to two-lane roadway, will provide the primary access roadway serving the project. Major intersections along Marble Lake Boulevard are planned to have roundabout control. Lime Rock Valley Boulevard will extend east of Marble Lake Boulevard as a two-lane roadway.

1.3 NOTICE OF PREPARATION COMMENTS REVIEW

The project's Notice of Preparation (NOP), which is required by CEQA was issued on February 20, 2013. The NOP and subsequent public scoping meeting provided interested parties the opportunity to formally comment on the project. This transportation analysis is informed by comments received during the NOP comment period. The following list summarizes transportation-related comments received by affected agencies and the general public.

Agency Comments Received

- Caltrans request to review the transportation scope. Caltrans recommended specific procedures for the analysis of state facilities. *Note: Coordination with Caltrans was completed during the NOP phase and included a meeting between Caltrans and El Dorado County to review study area and analysis methods.*
- CalFire request to review dead end road length calculations. *Note: The project has been reviewed and meets the requested length parameter.*

Public Comments Received (By Topic)

Public comments were incorporated into the environmental analysis as presented below.

General Traffic

- Impact of potential cut-through traffic on Cameron Estates roadways. *Note: No connections are proposed to Cameron Estates. Therefore, no evaluation of potential cut-through traffic on Cameron estates is necessary.*
- Concern regarding traffic congestion on Marble Valley Parkway. *Note: Analysis of Marble Valley Parkway is included in the study.*
- Need for a parallel and alternative route to US 50 on the south side of the freeway - *Note: Marble Valley Parkway will provide a parallel route to US 50 to the south.*

- Concern regarding congestion on US 50. *Note: Analysis of US 50 was coordinated with Caltrans and is included in the study.*
- Preclude future connections to the east, west and south as not to worsen cumulative impacts. *Note: The analysis does not assume new connections to the east, west, or south.*

Access

- Impact of proposed school siting and related congestion. *Note: The analysis includes the proposed schools.*
- Issue of increased traffic on rural County roads and related access. *Note: The analysis studied area rural roadways where the project is anticipated to contribute traffic.*
- Provide additional freeway access. *Note: Analysis of US 50 was coordinated with Caltrans and is included in the study. Freeway access is proposed and is consistent with the County's CIP.*
- Need more than the proposed access point from the community in the event of an emergency evacuation. *Note: Emergency vehicle access locations are proposed with the project.*

Pedestrian, Bicycle, Transit

- Review pedestrian, bicycle, trails and vehicle circulation plans to determine good connectivity between land uses. *Note: Bicycle and pedestrian facilities are evaluated in the study.*
- Evaluate transit options for employees. *Note: transit facilities and services are evaluated in the study.*
- Provide pedestrian and bicycle access to transit especially at night. *Note: Bicycle and pedestrian facilities are evaluated in the study.*

Figure 1.

Proposed Project

2.0 REGULATORY SETTING

Existing transportation polices, laws, and regulations that would apply to the proposed project are summarized below. This information provides a context for the impact discussion related to the project's consistency with applicable regulatory conditions.

2.1 STATE

2.1.1 CALIFORNIA DEPARTMENT OF TRANSPORTATION

The California Department of Transportation (Caltrans) is responsible for operating and maintaining the State highway system. In the project vicinity, US 50 falls under Caltrans jurisdiction. Caltrans provides administrative support for transportation programming decisions made by the California Transportation Commission (CTC) for state funding programs. The State Transportation Improvement Program (STIP) is a multi-year capital improvement program that sets priorities and funds transportation projects envisioned in long-range transportation plans.

In June 2014, Caltrans approved a *Transportation Concept Report and Corridor System Management Plan (TCR / CSMP) for United States Route 50*. Caltrans prepares a TCR / CSMP, which is a long-range (20-year) planning document, for each state highway. The purpose of each TCR / CSMP is to identify existing route conditions and future needs and to communicate the vision for the development of each route during a 20-year planning horizon. Caltrans has established LOS E as the 'concept LOS' consistent with the El Dorado County General Plan LOS policy. Since LOS E is identified as the concept LOS no further degradation of service from existing "E" is acceptable. The Concept LOS is a generalized LOS for large study segments used by Caltrans that reflect the minimum level of service or quality of operations acceptable for each route segment.

According to the *Guide for the Preparation of Traffic Impact Studies* (Caltrans, December 2002), the existing LOS should be maintained if a freeway facility is currently operating at an unacceptable LOS (e.g., LOS F). A project impact is said to occur if the project degrades LOS from an acceptable to unacceptable level. A project impact may also occur when the addition of project trips exacerbates existing LOS F conditions and leads to a perceptible increase in density on freeway mainline segments or ramp junctions, or a perceptible increase in service volumes in a weaving area. In addition, a project impact is said to occur when the addition of project trips causes a queue on the off-ramp approach to a ramp terminal intersection to extend beyond its storage area and onto the freeway mainline.

2.2 LOCAL

2.2.1 SACRAMENTO AREA COUNCIL OF GOVERNMENTS

The Sacramento Area Council of Governments (SACOG) is an association of local governments in the six-county Sacramento Region. Its members include the counties of Sacramento, El Dorado, Placer, Sutter, Yolo, and Yuba as well as 22 cities. SACOG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's long-range transportation plan, SACOG assists in planning for transit, bicycle networks, clean air, and airport land uses.

The *Metropolitan Transportation Plan / Sustainable Communities Strategy (MTP / SCS)* (SACOG 2016) is a federally mandated long-range fiscally constrained transportation plan for the six-county area. Most of this area is designated a federal non-attainment area for ozone, indicating that the transportation system is required to meet stringent air quality emissions budgets to reduce pollutant levels that contribute to ozone formation. To receive federal funding, transportation projects nominated by cities, counties, and agencies must be consistent with the MTP / SCS.

The *2017 / 20 Metropolitan Transportation Improvement Program (MTIP)* is a list of transportation projects and programs to be funded and implemented over the next 3 years. SACOG submits this document to Caltrans and amends the program on a quarterly cycle. Only projects listed in the MTP / SCS may be included in the MTIP.

2.2.2 EL DORADO COUNTY TRANSPORTATION COMMISSION (EDCTC)

The EDCTC is the Regional Transportation Planning Agency (RTPA) for El Dorado County, except for that portion of the County within the Tahoe Basin, which is under the jurisdiction of the Tahoe Regional Planning Agency (TRPA).

One of the fundamental responsibilities which results from RTPA designation is the preparation of the County's Regional Transportation Plan. The *El Dorado County Regional Transportation Plan 2015 – 2035 (RTP)* is designed to be a blueprint for the systematic development of a balanced, comprehensive, multi-modal transportation system. The EDCTC submits the RTP to SACOG for inclusion in the MTP / SCS process.

The *El Dorado County Bicycle Transportation Plan - 2010 Update* provides a blueprint for the development of a bicycle transportation system on the western slope of El Dorado County. The plan updates the currently adopted El Dorado County Bicycle Master Plan, which was adopted in January 2005.

In May 2013, The EDCTC completed the *El Dorado Hills Community Transit Needs Assessment and US 50 Corridor Operations Plan* (Plan), which explores how the recent growth and projected development impact the need for transit services, and identifies the most appropriate type and level of service needed given the demand. The Plan represents a recommendation from the Western El Dorado County 2008 Short-Range Transit Plan to study and consider improved transit service in the El Dorado Hills area.

In April 2015, The EDCTC adopted the Coordinated Public Transit – Human Services Transportation Plan, which is intended to improve mobility of individuals who are disabled, elderly, or of low-income status. The plan focuses on identifying needs specific to those population groups and identifying strategies to meet their needs.

2.2.3 COUNTY OF EL DORADO

The County of El Dorado provides for the mobility of people and goods within El Dorado Hills, which is an unincorporated area of the County.

The Transportation and Circulation Element of the El Dorado County General Plan (amended July 2016) outlines goals and policies that coordinate the transportation and circulation system with planned land uses. The following goals and their associated policies are relevant to the project.

- GOAL TC-1: To plan for and provide a unified, coordinated, and cost-efficient countywide road and highway system that ensures the safe, orderly, and efficient movement of people and goods.
- GOAL TC-X: To coordinate planning and implementation of roadway improvements with new development to maintain adequate levels of service on County roads. (The LOS policy specific to this project is described in Section 3.2.)
- GOAL TC-2: To promote a safe and efficient transit system that provides service to all residents, including senior citizens, youths, the disabled, and those without access to automobiles that also helps to reduce congestion, and improves the environment.
- GOAL TC-3: To reduce travel demand on the County's road system and maximize the operating efficiency of transportation facilities, thereby reducing the quantity of motor vehicle emissions and the amount of investment required in new or expanded facilities.
- GOAL TC-4: To provide a safe, continuous, and easily accessible non-motorized transportation system that facilitates the use of the viable alternative transportation modes.
- GOAL TC-5: To provide safe, continuous, and accessible sidewalks and pedestrian facilities as a viable alternative transportation mode.

The El Dorado County Community Development Agency's (CDA) *Transportation Impact Study Guidelines* set forth the protocols and procedures for conducting transportation analysis in the County (El Dorado County,

2014), including the identification of the study area. All of the study intersections for the proposed project are within the County's jurisdiction. This traffic analysis is consistent with the County-established methods at the commencement of the project.

2.2.4 EL DORADO COUNTY TRANSIT AUTHORITY

El Dorado County Transit Authority (EDCTA) operates El Dorado Transit, which provides public transit service within the project area. El Dorado Hills is currently served by El Dorado Transit Dial-A-Ride services, Commuter Service, and the Iron Point Connector Route.

The El Dorado Park-and-Ride Facilities Master Plan, November 2007 calls for constructing nine new facilities over 20 years. The Plan calls for EDCTA to assume primary responsibility for existing Park-and-Ride facilities in the county and sets forth an annual program to fund the upkeep and operation. The Plan reiterates that demand exceeds supply at the Park-and-Ride lot, referred to as the El Dorado Hills Multi-modal Facility, located in the northeast corner of the White Rock Road / Latrobe Road intersection. In particular, Table 2 of the Plan suggests that future (year 2027) deficiency at this location is 172 additional spaces. The Plan identifies the construction of a 325-space multi-story parking garage with ground floor retail as priority project #12 in the Capital Improvement Program list. The proposed location is the existing Park-and-Ride lot.

The plan identifies the construction of the Bass Lake Hills Multi-modal Facility as the #1 priority. The concept is a condition of the Bass Lake Hills Specific Plan, which requires a designated site suitable for the construction of a 200-space Park-and-Ride facility. New development is also required to construct the first 100 spaces. The plan states that completion of the 200-space facility would fully address parking deficiencies in the Cameron Park area. Another facility, named the Marble Valley Park-and-Ride lot, has been proposed on the south side of US 50 at the Bass Lake Road interchange as part of the Marble Valley development previously approved by the County. However, the plan states that the Marble Valley Park-and-Ride lot is redundant with the Bass Lake Hills Multi-modal Facility and instead suggests that the developer provide an in-lieu payment towards another proposed Park-and-Ride facility such as the Bass Lake Hills Multi-modal Facility.

3.0 METHOD OF ANALYSIS

3.1 ANALYSIS PROCEDURES

Intersections, roadways, and freeway facilities were selected for analysis based on coordination with the El Dorado County CDA, Long Range Planning staff and Caltrans, and based on the expected distribution of project trips and review of the El Dorado County CDA's *Transportation Impact Study Guidelines*.

Each study roadway facility was analyzed using the concept of Level of Service (LOS). LOS is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, for intersections and roadways LOS A represents conditions with little to no delay and congestion, and LOS F represents greater delay and more congestion. For basic freeway segments (i.e., like US 50 west of El Dorado Hills Boulevard), LOS A represents a vehicle density of up to 11 passenger cars per mile per lane and vehicle speeds (a secondary performance measure) at or above 65 miles per hour, and LOS F represents a vehicle density of greater than 45 passenger cars per mile per lane and vehicle speeds less than 52 miles per hour.

3.1.1 INTERSECTIONS

Traffic operations at the study intersections were analyzed using procedures and methodologies contained in the Highway Capacity Manual (HCM), Transportation Research Board, 2000 and 2010 (as confirmed with County staff). These methodologies were applied using Synchro or SimTraffic software packages, developed by Trafficware. Table 1 displays the delay range associated with each LOS category for signalized and unsignalized intersections based on the HCM.

The micro-simulation analysis software, SimTraffic, was used to analyze operations at the US 50 / El Dorado Hills Boulevard interchange (White Rock Road to Saratoga Way) to accurately analyze the effect of closely-spaced intersections. Simulation was requested by El Dorado County staff and Caltrans. The SimTraffic micro-simulation analysis applied the following methodology:

- The simulation was conducted for the entire peak hour (i.e., 60 minutes) using four 15-minute intervals with the peak hour factor applied in the second interval
- The results were based on the average of ten model runs
- Each of the ten simulation runs applied a ten-minute seeding time

The existing conditions SimTraffic model was validated to field measured traffic volumes and observed maximum vehicle queue lengths.

The HCM methodology determines the level of service (LOS) at signalized intersections by comparing the average control delay (i.e. delay resulting from initial deceleration, queue move-up time, time actually stopped, and final acceleration) per vehicle at the intersection to the established thresholds. The LOS for traffic signal controlled and all-way stop controlled intersections is based on the average control delay for the entire intersection. For side-street stop-controlled intersections, the LOS is evaluated separately for each individual movement with delay reported for the critical (i.e., worst case) turning movement.

The following procedures and assumptions were applied for the analysis of existing and cumulative conditions:

- Roadway geometric data were gathered using aerial photographs and field observations.
- Peak hour traffic volumes were entered according to the peak hour of each intersection, except for the US 50 / El Dorado Hills Boulevard interchange and adjacent intersections. For the interchange and adjacent intersections, a consistent peak hour was used so that volumes would balance (a requirement for accurate simulation analysis). The peak hour of the freeway is based traffic counts.
- Headway factors were adjusted based on the observed driver behavior. Drivers were observed to be more aggressive and use smaller headway to travel through the intersections near the US 50 / El Dorado Hills Boulevard interchange.
- The peak hour factor (PHF) was calculated based on traffic counts and applied by approach, except for interchange areas, which applied the intersection PHF (a requirement for accurate simulation analysis), and under cumulative conditions where there was a significant increase in traffic volumes compared to existing conditions was forecast (Intersections 3-8, 13, and 14). A PHF of 0.95 was used at these locations.
- The counted pedestrian and bicycle volumes will be used with a minimum of two pedestrians per approach per peak hour.
- Heavy vehicle percentages were based on traffic counts and applied by movement.
- Signal phasing and timings were based on existing signal timing sheets provided by El Dorado County and field observations at the US 50 / El Dorado Hills Boulevard interchange.
- Speeds for the model network were based on the posted speed limit.

- The PHF calculated for existing conditions was used for cumulative conditions, except for the Latrobe Road / Town Center Boulevard, US 50 EB Ramps / El Dorado Hills Boulevard, US 50WB Ramps / El Dorado Hills Boulevard, and the Saratoga Way / Park Drive / El Dorado Hills Boulevard intersections where a PHF of 0.95 was applied.
- The existing heavy vehicle percentages were maintained for cumulative conditions, except for the Silva Valley interchange, which was increased to 2 percent for both the AM and PM peak hours.
- The existing pedestrian and bicycle volumes were maintained for cumulative conditions.
- Traffic signals were optimized to serve future traffic volumes.

TABLE 1: INTERSECTION LEVEL OF SERVICE CRITERIA

Level-of-Service	Average Control Delay (seconds / vehicle)		Description
	Signalized	Stop Controlled	
A	< 10.0	< 10.0	Very low delay. At signalized intersections, most vehicles do not stop.
B	10.1 to 20.0	10.1 to 15.0	Generally good progression of vehicles. Slight delays.
C	>20.1 to 35.0	>15.1 to 25.0	Fair progression. At signalized intersections, increased number of stopped vehicles.
D	>35.1 to 55.0	>25.1 to 35.0	Noticeable congestion. At signalized intersections, large portion of vehicles stopped.
E	>55.1 to 80.0	>35.1 to 50.0	Poor progression. High delays and frequent cycle failure.
F	>80.0	>50.0	Oversaturation. Forced flow. Extensive queuing.

Source: Highway Capacity Manual (Transportation Research Board, 2010)

3.1.2 ROADWAY SEGMENTS

Roadway segment LOS was determined by comparing traffic volumes for selected roadway segments with peak hour LOS capacity thresholds. These thresholds are shown in Table 2 and were calculated based on the methodology contained in the Highway Capacity Manual (Transportation Research Board, 2000) and applied for the analysis of the 2004 El Dorado County General Plan.

**TABLE 2:
 PEAK HOUR ROADWAY SEGMENT CAPACITIES BY FUNCTIONAL CLASSIFICATION AND LOS**

Functional Classification	Lanes	Roadway Segment Capacity (Vehicles per Hour)				
		LOS A	LOS B	LOS C	LOS D	LOS E
Arterial (Divided)	4	N / A	N / A	1,850	3,220	3,290
	5	N / A	N / A	2,350	4,060	4,110
	6	N / A	N / A	2,760	4,680	4,710
	7	N / A	N / A	3,215	5,410	5,420
Arterial (Undivided)	2	N / A	N / A	850	1,540	1,650
	4	N / A	N / A	1,760	3,070	3,130

Notes: Peak hour roadway segment capacities based on the HCM 2010 and developed by the El Dorado County CDA, Long Range Planning. Five-lane capacity calculated by adding half of the difference between the two-lane and four-lane capacity to the four-lane capacity. Seven-lane capacity calculated by adding half of the difference between the four-lane and six-lane capacity to the four-lane capacity,

Source: Fehr & Peers, 2018

3.1.3 FREEWAY FACILITIES

The Highway Capacity Manual (Transportation Research Board, 2010), includes three different tiers of analysis for freeway facilities, which include planning, design, and operations analysis. The different tiers are intended to provide flexibility to the user in selecting the appropriate analysis level given available resources (e.g., time and availability of analysis inputs) and the desired breadth of analysis coverage (e.g., more locations with less detail vs. fewer locations with more detail). For example, a planning level analysis requires relatively generalized analysis inputs and is regularly used when the breadth of coverage is more

important than analysis detail. For example, Caltrans uses planning level analysis for long-range planning efforts like the US 50 Corridor System Management Plan, which groups many freeway facilities into single analysis segments. The project level analysis in this report is based on operations analysis methods and analyzes each freeway facility separately, focusing on analysis detail instead of breadth of coverage. The operations analysis method is consistent with General Plan Policy TC-Xd and Caltrans traffic impact study guidelines.

Freeway operations were analyzed using the procedures and methodologies contained in the Highway Capacity Manual (Transportation Research Board, 2010). Table 3 describes the HCM LOS criteria for freeway mainline, freeway ramp junctions, and freeway weaving segments. For weaving segments, Caltrans District 3 prefers analysis based on the Leisch Method, which is described in the *Highway Design Manual* (Caltrans, last updated July 1, 2008). For consistency with both the El Dorado County General Plan and Caltrans preference, analysis of freeway weaving segments was conducted using both the HCM and Leisch Methods.

**TABLE 3:
 FREEWAY FACILITY LEVEL OF SERVICE CRITERIA**

Level of Service	Density (vehicles / mile / lane)		
	Mainline	Ramp Junction	Weaving
A	≤ 11		≤ 10
B	11 – 18		10 – 20
C	18 – 26		20 – 28
D	26 – 35		28 – 35
E	35 – 45		> 35
F	> 45	Demand exceeds capacity	

Source: Transportation Research Board, 2010

3.2 THRESHOLDS OF SIGNIFICANCE

In accordance with CEQA, the effects of a project are evaluated to determine if they will result in a significant adverse impact on the environment. Informed by the 2014 California Environmental Quality Act (CEQA)

Statutes and Guidelines, specifically Appendix G, the following criteria have been established to determine whether or not the project would have a significant impact on transportation and circulation.

The intent of CEQA Section 15064 is for the responsible agency to establish the thresholds in the context of what their specific values are towards environmental resources or impacts. Therefore, the standards of significance in this analysis are based on the framework presented in CEQA Appendix G and the current practice of the appropriate regulatory agencies. For most areas related to transportation and circulation, policies from the *2004 El Dorado County General Plan (amended January 2009)* and the *El Dorado County CDA's Transportation Impact Study Guidelines (El Dorado County, 2014)* were used. For the freeway system, Caltrans' standards were used. Implementation of the project would have a potentially significant impact on transportation and circulation if it causes any of the following outcomes:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness (MOEs) for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. The following specific MOEs, which have been generated by the regulatory agencies, are applicable to this project.
 - General Plan Circulation Policy TC-Xd provides Level of Service standards for County-maintained roads and state highways as follows¹:
 - Level of Service (LOS) for County-maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in the Community Regions or LOS D in the Rural Centers and Rural Regions except as specified in Table TC-2. The volume to capacity ratio of the roadway segments listed in Table TC-2 as applicable shall not exceed the ratio specified in that table. *(Note: Two of the study roadways are presented in Table TC-2. Cambridge Road from Country Club Drive to Oxford Road is allowed a maximum volume-to-capacity (V / C) ratio of 1.07 until 2018. Cameron Park Drive from Robin Lane to Coach Lane is allowed a maximum V / C ratio of 1.11 until 2018.)*
 - If a project causes the peak hour level of service or volume / capacity ratio on a county road or state highway that would otherwise meet the County standards (without the project) to exceed the LOS threshold, then the impact shall be considered significant.
 - If any county road or state highway fails to meet the above listed county standards for peak hour level of service or volume / capacity ratios under existing conditions, and the project will "significantly worsen" conditions on the road or highway, then the impact shall be considered significant. The term "significantly worsen" is

¹ El Dorado County CDA's *Transportation Impact Study Guidelines*



defined for the purpose of the paragraph according to General Plan Policy TC-Xe as follows:

- A. A two (2) percent increase in traffic during the AM peak hour, PM peak hour or daily, OR
 - B. The addition of 100 or more daily trips, OR
 - C. The addition of 10 or more trips during the AM peak hour or the PM peak hour.
- 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 (i.e., exceed the available storage capacity);
 - Project traffic increases that cause any ramp's merge / diverge level of service to be worse than the freeway's level of service.
 - Any additional traffic generated by the project is added to a facility already operating at LOS F².
 - Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
 - Result in inadequate emergency access.
 - Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.
 - The County has published the following issues and General Plan goals as relevant to traffic impact study assessments. The project may trigger a potentially significant impact if it's in conflict with any of the following:
 - Access to Public Transit Services consistent with General Plan Circulation Element Goal TC-2: "To promote a safe and efficient transit system that provides service to all residents, including senior citizens, youths, the disabled, and those without access to automobiles that also helps to reduce congestion, and improves the environment."
 - Transportation System Management consistent with General Plan Circulation Element Goal TC-3: "To reduce travel demand on the County's road system and maximize the operating efficiency of transportation facilities, thereby reducing the

² The US 50 Transportation Corridor Concept Report identifies LOS E as the "Concept LOS" for US 50 from the Sacramento/El Dorado County line to Cameron Park Drive.



quantity of motor vehicle emissions and the amount of investment required in new or expanded facilities.”

- Non-Motorized Transportation consistent with General Plan Circulation Element Goal TC-4: “To provide a safe, continuous, and easily accessible non-motorized transportation system that facilitates the use of the viable alternative transportation modes.”
- Conflict with adopted policies, plans or programs regarding the delivery of goods and services.



4.0 EXISTING SETTING

4.1 STUDY AREA

Based on coordination with the El Dorado County CDA (Long Range Planning) staff and Caltrans, the expected distribution of project trips, and review of the *El Dorado County Department of Transportation's Traffic Impact Study Protocols and Procedures*, the following study intersections, roadway segments and freeway facilities have been selected for analysis during both the AM and PM peak hours. Figure 2 identifies the study area.

The following lists both existing intersections and intersections proposed as part of the project. The applicable LOS target (LOS E for Community Regions and LOS D for Rural Regions) is identified for each study intersection.



Existing Intersections

1. Serrano Parkway / Bass Lake Road (LOS E)
2. Hollow Oak Drive / Bass Lake Road (LOS E)
3. Old Bass Lake Road / Bass Lake Road (LOS D)
4. Country Club Drive / Bass Lake Road (LOS D)
5. US 50 westbound ramps / Bass Lake Road (LOS D)
6. US 50 eastbound ramps / Bass Lake Road (LOS D)
7. Marble Mountain Road / Marble Valley Parkway (LOS D)
8. Marble Valley Parkway / Marble Ridge Road (LOS D)
9. Country Club Drive / Cambridge Road (LOS E)
10. Knollwood Drive / Cambridge Road (LOS E)
11. Merrychase Drive / Cambridge Road / US 50 westbound ramps (LOS E)
12. US 50 eastbound ramps / Cambridge Road (LOS E)
13. Crazy Horse Road / Flying C Road / Cambridge Road (LOS E)
14. Flying C Road / Marble Valley Parkway (LOS E)
15. US 50 westbound ramps / El Dorado Hills Boulevard (LOS E)
16. US 50 eastbound ramps / Latrobe Road (LOS E)
17. Silva Valley Parkway / US 50 Westbound Ramps (LOS E)
18. Silva Valley Parkway / US 50 Eastbound Ramps (LOS E)
19. Saratoga Way / El Dorado Hills Boulevard (LOS E)
20. Town Center Boulevard / Latrobe Road (LOS E)
21. White Rock Road / Latrobe Road (LOS E)

Roadways:

- Bass Lake Road
- Cambridge Road
- Cameron Park Drive
- Country Club Drive
- Durock Road

Freeway Facilities:

- US 50 Mainline (Eastbound and Westbound) – Sacramento County to Cameron Park Drive



- El Dorado Hills Boulevard Interchange
- Bass Lake Road Interchange
- Cameron Park Interchange
- Silva Valley Parkway Interchange (Phase 1 under Existing Conditions)

4.2 ROADWAY NETWORK

The characteristics of the roadway system in the vicinity of the project are described below. Where applicable, the roadway designation given in the *2004 El Dorado County General Plan (amended January 2009)* is provided.

US Route 50 (US 50) is an east-west freeway located south of the project site. Generally, US 50 serves the majority of El Dorado County's major population centers and provides regional connections to the west (i.e., Sacramento) and to the east (i.e., State of Nevada). Primary access to the project from US 50 is provided via the US 50 / Bass Lake Road and US 50 / Cambridge Road interchanges. Near the project, westbound US 50 has a high-occupancy vehicle (HOV) lane and two general purpose travel lanes and eastbound US 50 has an HOV lane and three general purpose travel lanes west of Bass Lake Road and an HOV lane and two general purpose travel lanes between Bass Lake Road and Cambridge Road. The General Plan identifies US 50 as an eight lane freeway under future conditions. US 50 serves about 63,000 vehicles per day between Bass Lake Road and Cambridge Road.

Completed in 2015, construction at the US 50 / El Dorado Hills Boulevard / Latrobe Road interchange improved the westbound on- and off-ramps, added 1,000 feet of auxiliary lane to westbound US 50, and provided westbound ramp metering and a dedicated HOV on-ramp lane. Future improvements are planned for this interchange as described in Section 6.1, Table 12.

Phase 1 of US 50 / Silva Valley Parkway / White Rock Road interchange is west of the project area completed construction and was open to traffic in 2016. Phase 1 (CIP Project No: 71328) is a new connection to US 50 with new signalized slip on- and off-ramps westbound and a slip off-ramp and loop on-ramp eastbound. The mainline will have an overcrossing for Silva Valley Parkway and will be improved to include eastbound and westbound auxiliary lanes between the US 50 / El Dorado Hills Boulevard / Latrobe Road interchange and the new US 50 / Silva Valley interchange. Completion of Phase 1 is scheduled for 2016. Phase 2 will construct a westbound loop on-ramp and eastbound slip on-ramp (CIP Project No: 71345). The westbound loop on-ramp will begin the addition of an auxiliary lane that will continue westbound through the El Dorado Hills Boulevard interchange and terminate at the planned US 50 / Empire Ranch interchange.



The planned reconstruction of the US 50 / Bass Lake Road interchange (CIP Project No: 71330 and GP148), will add a westbound auxiliary lane between the Bass Lake Road and Silva Valley Parkway interchanges.

Bass Lake Road is a two-lane roadway that generally follows a north-south alignment from north of US 50 to Green Valley Road. Marble Valley Parkway is the continuation of Bass Lake Road south of US 50 and is proposed as the primary route to the project. The County's General Plan identifies Bass Lake Road as a four lane divided road near US 50 transitioning to a four lane undivided road and eventually a two-lane road as it continues north. Bass Lake Road serves about 11,000 vehicles per day north of US 50.

Cambridge Road is a two-lane roadway that generally follows a north-south alignment from north of US 50 to Green Valley Road. The project will access the US 50 / Cambridge Road interchange by way of Marble Valley Parkway with a connection to Flying C Road (north of the Cameron Estates entry gate). The County's General Plan identifies Cambridge Road as a major two lane road. Cambridge Road serves about 8,000 vehicles per day north of Country Club Drive.

Cameron Park Drive north of Palmer Drive, is a two-lane roadway to Green Valley Road. North of Green Valley Road, Cameron Park Drive continues as Starbuck Road. South of Palmer Drive, the roadway widens to four lanes with a center left-turn lane through the US 50 interchange to Coach Lane where it narrows again. Durock Road is the continuation of Cameron Park Drive south of Robin Lane. The County's General Plan identifies Cameron Park Drive as a four lane divided roadway from US 50 to Meder Road. Remaining portions are classified as a major two lane road. Cameron Park Drive serves about 20,000 vehicles per day south of Hacienda Drive.

Country Club Drive is a two-lane east-west roadway that generally runs parallel to and north of US 50. Country Club Drive provides connectivity between Bass Lake Road and Cameron Park Drive. It serves as a frontage road to US 50 and a connection between El Dorado Hills and Cameron Park communities. The County's General Plan identifies Country Club Drive as a major two lane road. Country Club Drive serves about 4,000 vehicles per day east of Bass Lake Road.

Flying "C" Road is two travel lanes south of the US 50 eastbound ramp-terminal intersection at the US 50 / Cambridge Road interchange. The project will access the US 50 / Cambridge Road interchange by way of Marble Valley Parkway with a connection to Flying C Road (north of the Cameron Estates entry gate). The County's General Plan does not specifically identify Flying "C" Road on the Circulation Map. Flying C Road serves about 500 vehicles per day.

El Dorado Hills Boulevard is a north-south roadway that continues as Salmon Falls Road on the north and Latrobe Road on the south. The roadway is four lanes with a center median between Park Drive and Governor Drive. Between US 50 and Park Drive, the roadway section widens to six lanes to accommodate



vehicle demand near the US 50 interchange. The County's General Plan identifies El Dorado Hills Boulevard as a four lane divided road except near US 50 where the designation changes to a six lane divided road. El Dorado Hills Boulevard serves about 22,000 vehicles per day north of Wilson Boulevard.

Latrobe Road is a north-south roadway and is the continuation of El Dorado Hills Boulevard south of US 50. Latrobe Road is six lanes near the US 50 interchange, narrows to four lanes south of White Rock Road and eventually narrows to two lanes as it continues south to connect with State Route 16 in Amador County. The General Plan identifies Latrobe Road as a six lane divided roadway near the US 50 interchange transitioning to a four lane divided road, then a two lane major road and eventually a two lane regional road serving the southwest portion of the County. Latrobe Road serves about 30,000 vehicles per day north of White Rock Road.

Marble Mountain Road is a relatively short two-lane roadway that serves rural residential properties south of US 50. The roadway is west of the project area but intersects Marble Valley Parkway near the US 50 / Bass Lake Road interchange. The County's General Plan does not specifically identify Marble Mountain Road on the Circulation Map. Marble Mountain Road serves less than 200 vehicles per day.

Marble Valley Parkway is a two-lane roadway just south of US 50. The road terminates approximately 500 feet south of the US 50 / Bass Lake Road interchange. Marble Valley Parkway is the continuation of Bass Lake Road south of US 50 and is the primary route to the proposed project. The County's General Plan does not specifically identify Marble Valley Parkway on the Circulation Map. Marble Valley Parkway serves less than 200 vehicles per day.

Serrano Parkway primarily serves residential land uses west of Bass Lake Road. The roadway provides one lane in each direction with a landscaped median west of Bass Lake Road. A new traffic signal was installed at the Bass Lake Road / Silva Valley Parkway intersection as part of improvement to add the east leg to the intersection. The General Plan identifies this segment of Serrano Parkway as a major two lane road. Serrano Parkway serves about 5,000 vehicles per day west of Bass Lake Road.

Silva Valley Parkway is a north-south roadway that generally runs parallel to El Dorado Hills Boulevard north of US 50. Silva Valley Parkway ranges from two lanes to four lanes with a center median within the study area. The General Plan identifies Silva Valley Parkway as a four lane divided road. A new US 50 interchange at Silva Valley / White Rock Road is open to traffic and is included in the existing and the Cumulative conditions transportation analysis. The interchange project provides a realigned Silva Valley Parkway that will connect to the existing four-lane Silva Valley Parkway to the north and the existing two-lane White Rock Road on the south. A new signalized intersection will be installed where the new Silva Valley Parkway intersects old White Rock Road on the south. Silva Valley Parkway serves about 10,300 vehicles per day north of US 50.



White Rock Road is the continuation of Silva Valley Parkway south of US 50. White Rock Road is predominately a two or three lane roadway until west of Latrobe Road where the cross section widens to four lanes. White Rock Road was recently widened east of Latrobe Road to Monte Verde Drive to accommodate four lanes, sidewalks and Class II bicycle lanes. The General Plan identifies White Rock Road as a six lane divided road east of Latrobe Road and a four lane divided road west of Latrobe Road. The US 50 / Silva Valley Parkway / White Rock Road interchange will modify the roadway alignment and introduce a new signalized intersection at the intersection of White Rock Road / Existing Silva Valley Parkway / New Silva Valley Parkway and is assumed under Cumulative conditions. White Rock Road serves about 10,600 vehicles per day south of US 50.

4.3 EXISTING CONDITIONS PEAK HOUR TRAFFIC VOLUMES

Intersection, roadway segment, and freeway counts were collected to determine the existing traffic operations of study facilities. Weather conditions were generally dry and local schools were in full session, during the traffic count data collection.

For study intersections, AM peak period (6 AM to 9 AM) and PM peak period (4 PM to 7 PM) intersection turning movement counts were collected per the *Transportation Impact Study Guidelines*, in May 2012, January 2013, and December 2016 (i.e., to capture conditions with the opening of the US 50 / Silva Valley Parkway interchange). For study roadways, a combination of peak hour traffic counts from the County's database and the intersection turning movement counts were used. As discussed in Section 3.1.1, the Latrobe Road / White Rock Road, Latrobe Road / Town Center Boulevard, US 50 EB Ramps / El Dorado Hills Boulevard, US 50WB Ramps / El Dorado Hills Boulevard, and the Saratoga Way / Park Drive / El Dorado Hills Boulevard intersections were analyzed using SimTraffic micro-simulation with a common analysis hour (a requirement for accurate simulation analysis).

Each of the other study intersection's peak hours within the peak period was used for the analysis. For the majority of study intersections, the counts indicate that the AM peak hour is between 7:15 AM and 8:15 AM and the PM peak hour is between 5:00 PM and 6:00 PM. Figure 3 provides peak hour traffic volumes, lane configurations and traffic controls at each of the study intersections. Following is a list of both existing intersections and intersections proposed as part of the project.

Roadway segment traffic counts were collected for 20 roadway segments on Bass Lake Road, Cambridge Road, Cameron Park Drive, Country Club Drive, and Durock Road.

For US 50, directional traffic counts were collected during the AM peak period (6 AM to 9 AM) and PM peak period (3 PM to 6 PM) and included vehicle classification (i.e., automobiles and trucks) and vehicles using



the high occupancy vehicle (HOV) lanes. The freeway traffic counts were conducted midweek (i.e., Tuesday, Wednesday, and Thursday) in August 2013. The August 2013 traffic counts were verified for reasonableness by comparing to traffic data from Caltrans' Performance Measurement System (PeMS) and the Transportation Systems Network (TSN) data. PeMS data is collected continuously from traffic counts detectors located in the travel lanes of freeway facilities (HOV, general purpose, and on- and off-ramps). The TSN data includes an estimate of peak hour traffic based on seven day traffic counts. Figure 4 provides peak hour traffic volumes and lane configurations on US 50. Based on the August 2013 counts, heavy vehicles (i.e., trucks) represented one- and two-percent of westbound traffic during the morning and evening peak hours, respectively. In the eastbound direction, heavy vehicles represented four- and one-percent of traffic during the morning and evening peak hours, respectively. These peak hour heavy vehicle percentages are lower than rates based on daily traffic volumes, since heavy vehicles avoid peak hour conditions. The traffic counts are representative of current conditions. The traffic counts used in the analysis are higher than traffic counts that Caltrans provided to El Dorado County for their use in updating the Western Slope Capital Improvement Plan (CIP) and Traffic Impact Mitigation (TIM) Fee Program. Therefore, the freeway analysis presented is conservative relative to the CIP analysis.



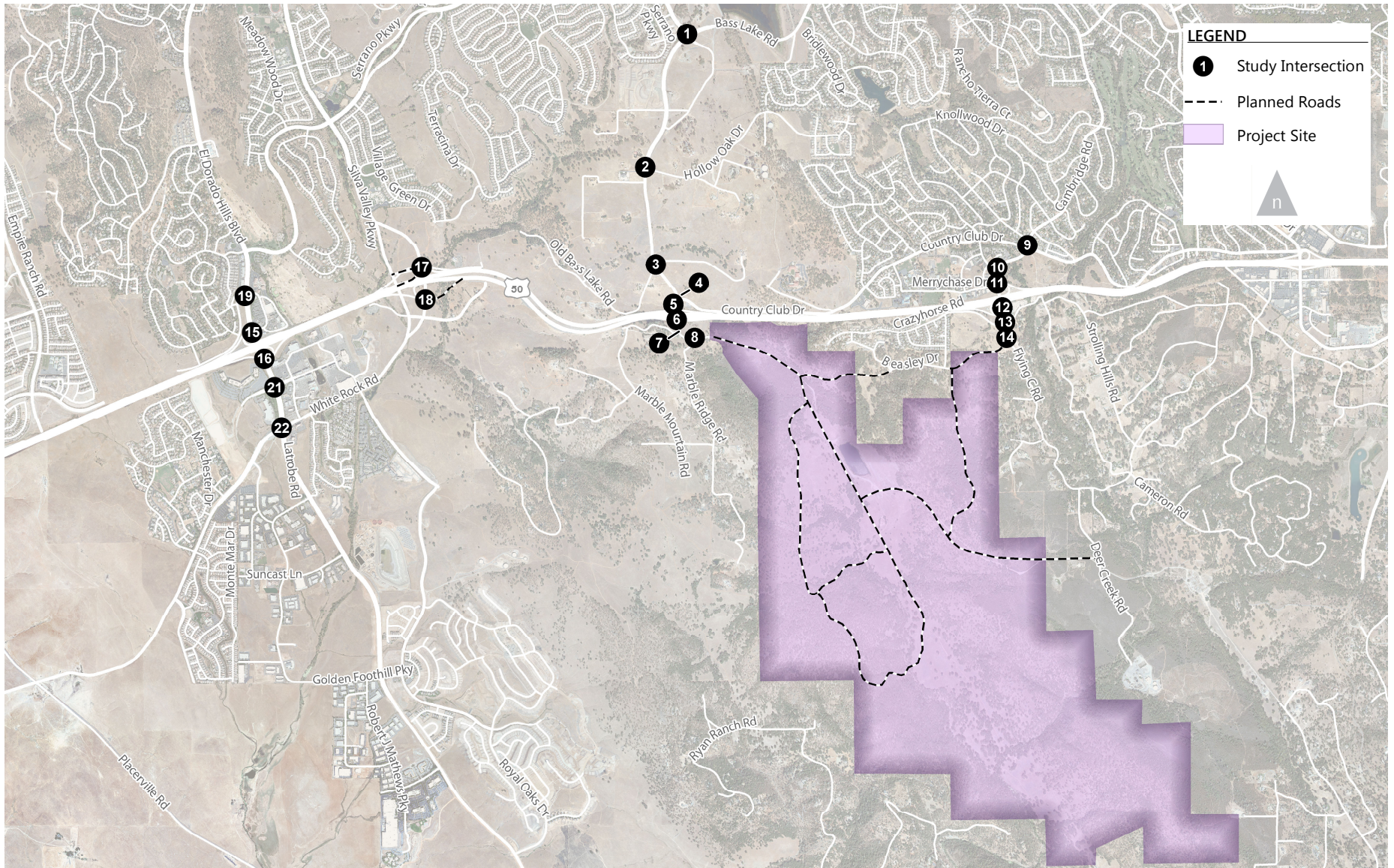
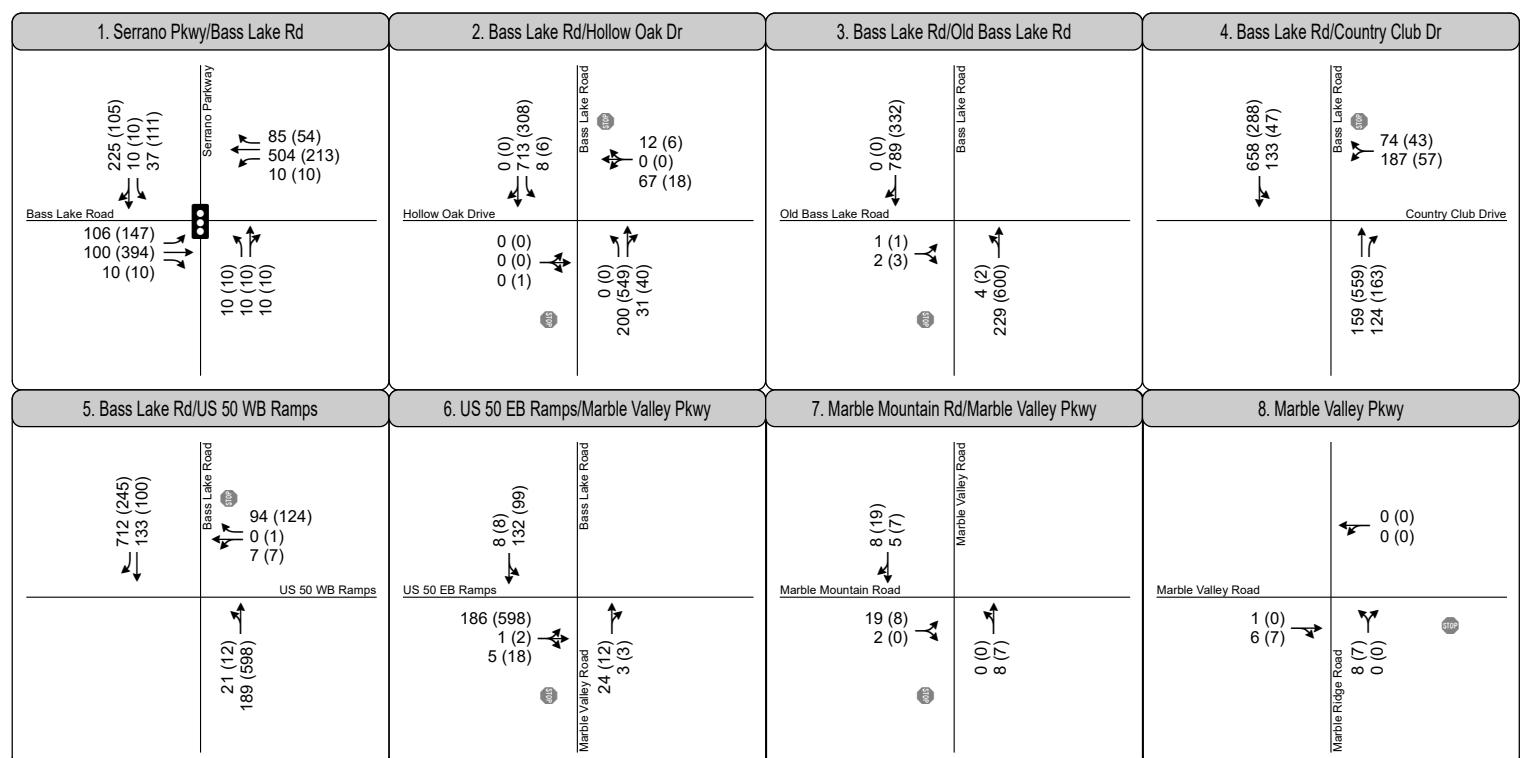
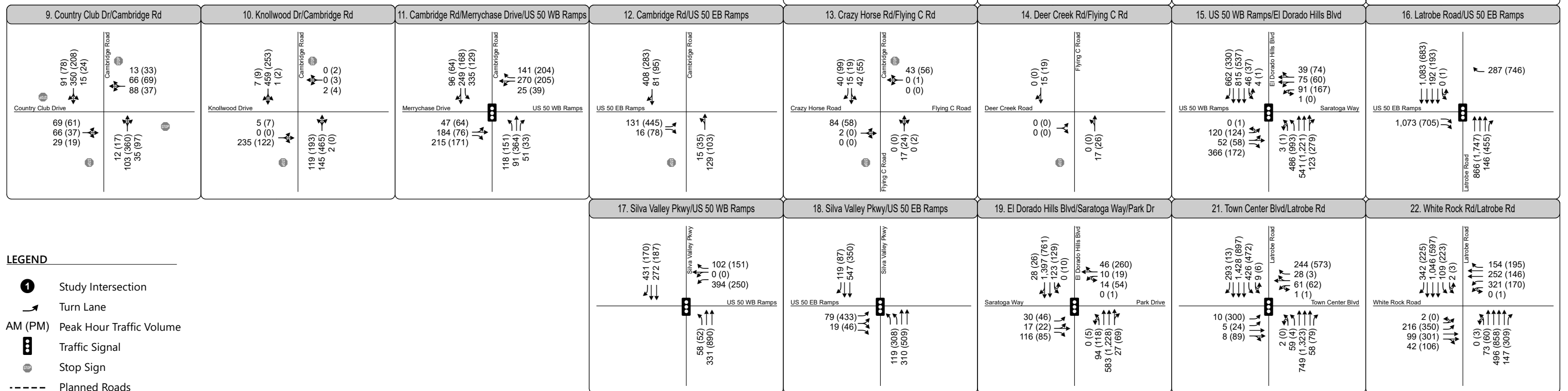
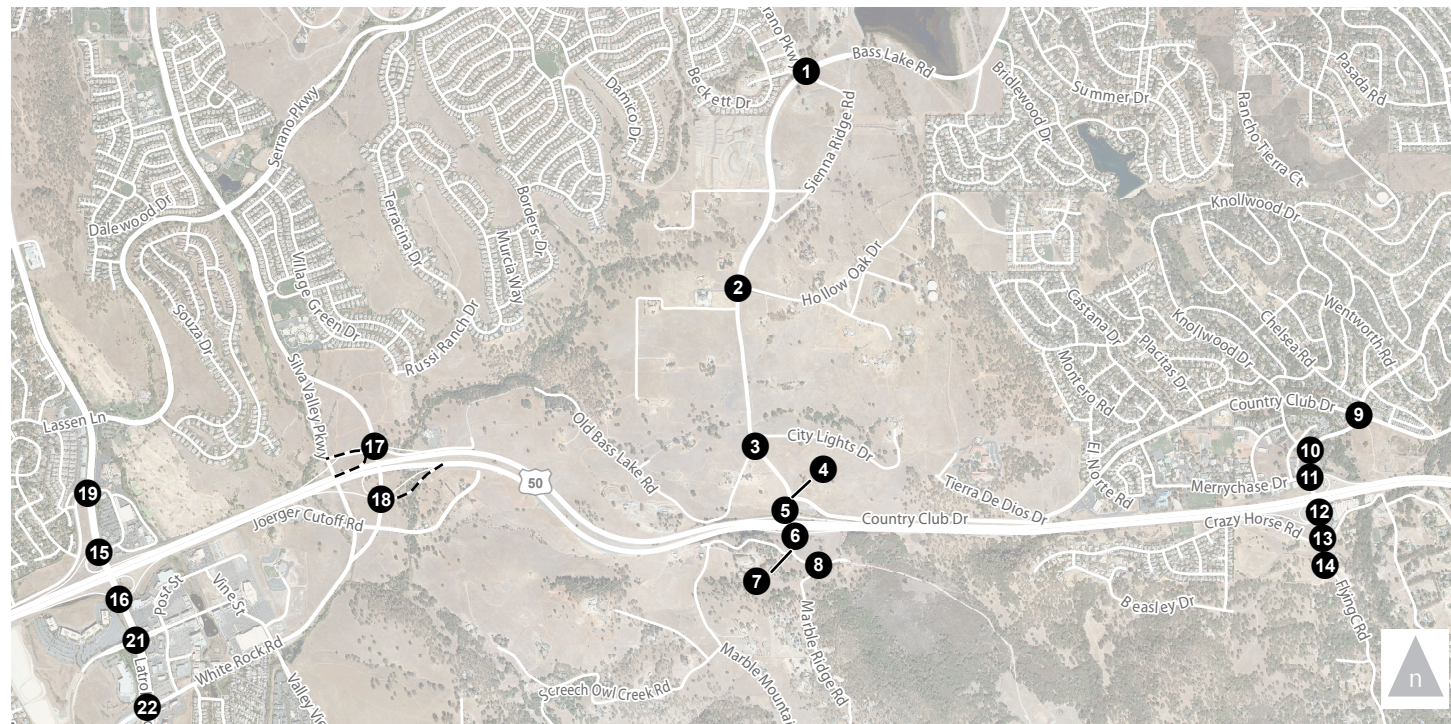


Figure 2.

Study Area



LEGEND

- Study Intersection
- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign
- Planned Roads

Figure 3.
Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

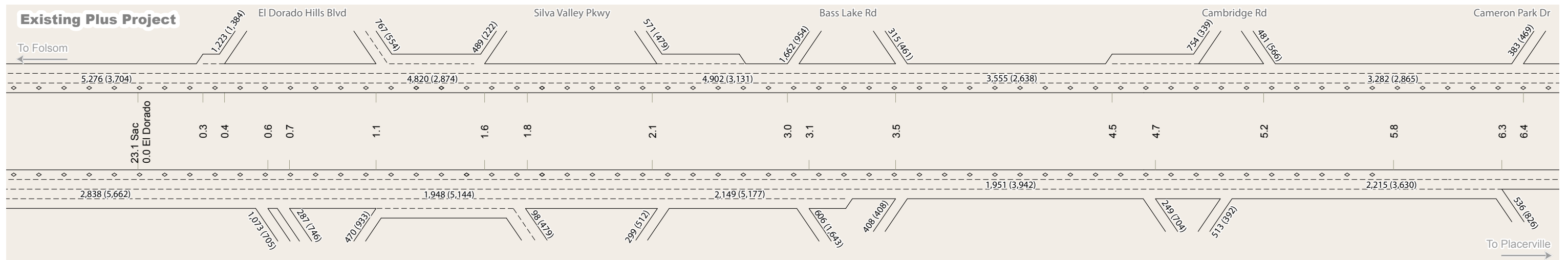
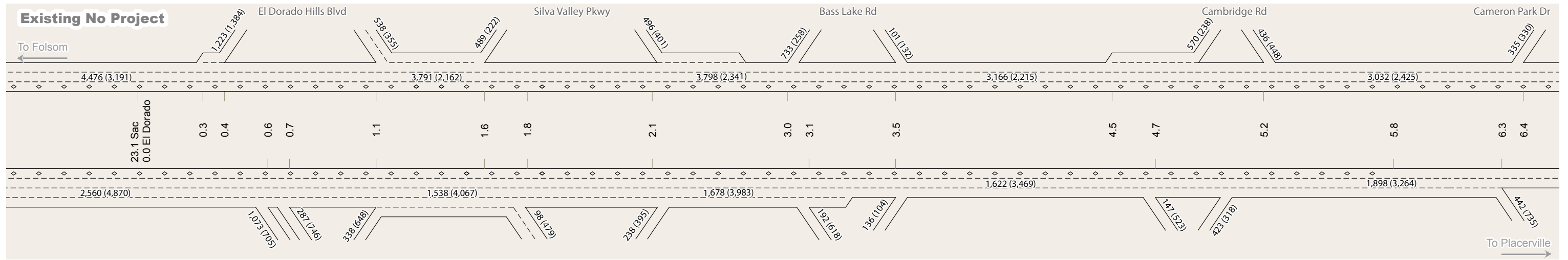


Figure 4.
Freeway Mainline and Ramp Peak Hour Traffic Volumes - Existing Conditions

4.4 EXISTING CONDITIONS PEAK HOUR VEHICLE LEVEL OF SERVICE

4.4.1 INTERSECTIONS

Table 4 summarizes existing conditions AM and PM peak hour Level of Service (LOS) for the study intersections. The LOS of a facility is a qualitative measure used to describe operating conditions. LOS ranges from A (best), which represents short delays, to LOS F (worst), which represents long delays and a facility that is operating at or near its functional capacity.

As described in Section 2.2, an intersection that is operating at LOS D or better in a Rural Region or LOS E or better in a Community Region is considered to operate at an acceptable level. The following three study intersections operate at LOS F:

- Bass Lake Road / Country Club Drive – LOS F during the AM peak hour
- Bass Lake Road / US 50 eastbound ramps – LOS F during the PM peak hour
- Cambridge Drive / Knollwood Drive – LOS F during the AM peak hour

All three intersections have side-street stop control.

Detailed LOS analysis sheets are contained in Appendix A. See section 3.1 and Table 1 for a definition of LOS as it relates to intersection delay.

TABLE 4: PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS (INTERSECTION)

Intersection	LOS Target	Traffic Control	LOS / Delay (seconds)	
			AM Peak Hour	PM Peak Hour
1. Bass Lake Road / Serrano Parkway	E	Signal	C / 20	B / 18
2. Bass Lake Road / Hollow Oak Drive	E	SSSC	C / 20	B / 14
3. Bass Lake Road / Old Bass Lake Road	D	SSSC	C / 20	B / 12
4. Bass Lake Road / Country Club Drive	D	SSSC	F / >180	C / 22
5. Bass Lake Road / US WB 50 Ramps	D	SSSC	B / 11	C / 16
6. Bass Lake Road / US EB 50 Ramps	D	SSSC	C / 20	F / 58



TABLE 4: PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS (INTERSECTION)

Intersection	LOS Target	Traffic Control	LOS / Delay (seconds)	
			AM Peak Hour	PM Peak Hour
7. Marble Valley Parkway / Marble Mountain Road	D	SSSC	A / 9	A / 9
8. Marble Valley Parkway / Marble Ridge Road	D	SSSC	A / 9	A / 9
9. Cambridge Road / Country Club Drive	E	AWSC	E / 39	C / 18
10. Cambridge Road / Knollwood Drive	E	SSSC	F / 82	E / 41
11. Cambridge Road / Merrychase Drive / US 50 WB Ramps	E	Signal	D / 54	C / 28
12. Cambridge Road / US 50 EB Ramps	E	SSSC	B / 14	E / 45
13. Cambridge Road / Flying C Road / Crazy Horse Road	E	SSSC	B / 12	B / 11
14. Flying C Road / Marble Valley Parkway	E	SSSC	A / 0	A / 0
15. El Dorado Hills Boulevard / US 50 WB Ramps / Saratoga Way	E	Signal	C / 31	C / 33
16. Latrobe Road / US 50 EB Ramps	E	Signal	C / 33	C / 20
17. Silva Valley Parkway / US 50 WB Ramps	E	Signal	B / 11	A / 10
18. Silva Valley Parkway / US 50 EB Ramps	E	Signal	B / 10	B / 13
19. El Dorado Hills Boulevard / Park Drive / Saratoga Way	E	Signal	B / 19	C / 20
21. Latrobe Road / Town Center Boulevard	E	Signal	B / 16	D / 50
22. Latrobe Road / White Rock Road	E	Signal	C / 31	C / 27



TABLE 4: PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS (INTERSECTION)

Intersection	LOS Target	Traffic Control	LOS / Delay (seconds)	
			AM Peak Hour	PM Peak Hour

Notes: SSSC = side-street stop-control, AWSC = all-way stop control

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

The average delay is measured in seconds per vehicle. For signalized and AWSC intersections, the delay shown is the average control delay for the overall intersection. For SSSC intersections, the LOS and control delay for the worst movement is shown.

Intersection LOS and delay is calculated based on the procedures and methodology contained in the *HCM* (TRB, 2000). Intersections 1-14 and 22 are analyzed in Synchro 7. Intersections 15-16 and 19-22 are analyzed in SimTraffic.

Source: Fehr & Peers, 2018



4.4.2 ROADWAY SEGMENTS

Table 5 summarizes existing conditions AM and PM peak hour LOS for the study roadways. All study area roadway segments operate acceptably, with most operating at LOS C or better.

Detailed LOS analysis sheets are contained in Appendix A. See section 3.1 and Table 2 for a definition of LOS as it relates to roadway segments.

TABLE 5: PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS (ROADWAY SEGMENTS)

Roadway	Segment	Facility Type	Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour
Bass Lake Rd	Green Valley Rd to Bridlewood Dr	2 lane arterial	503 / 0.30 / C ¹	486 / 0.29 / C ¹
	Bridlewood Dr to Serrano Pkwy	2 lane arterial	726 / 0.44 / C ¹	772 / 0.47 / C ¹
	Serrano Pkwy to Hollow Oak Dr	2 lane arterial	933 / 0.57 / D	869 / 0.53 / D
	Hollow Oak Dr to Country Club Dr	2 lane arterial	1,023 / 0.62 / D	928 / 0.56 / D
	Country Club Dr to US 50	2 lane arterial	1,128 / 0.68 / D	1,067 / 0.65 / D
Cambridge Rd	Green Valley Rd to Oxford Rd	2 lane arterial	381 / 0.23 / C ¹	394 / 0.24 / C ¹
	Oxford Rd to Knollwood Dr ²	2 lane arterial	641 / 0.39 / C ¹	764 / 0.46 / C ¹
	Knollwood Dr to Country Club Dr ²	2 lane arterial	617 / 0.37 / C ¹	738 / 0.45 / C ¹
	Country Club Dr to US 50	2 lane arterial	959 / 0.58 / D	993 / 0.60 / D
Cameron Park Dr	Green Valley Rd to Alhambra Dr	2 lane arterial	654 / 0.40 / C ¹	793 / 0.48 / C ¹
	Alhambra Dr to Oxford Rd	2 lane arterial	1,211 / 0.73 / D	1,434 / 0.87 / D
	Oxford Rd to Hacienda Dr	2 lane arterial	1,080 / 0.65 / D	1,612 / 0.98 / E
	Hacienda Dr to US 50	4 lane undivided arterial	1,084 / 0.35 / C ¹	1,636 / 0.52 / C ¹
Country Club Dr	Bass Lake Rd to Merrychase Dr	2 lane arterial	518 / 0.31 / C ¹	310 / 0.19 / C ¹
	Merrychase Dr to Knollwood Dr	2 lane arterial	481 / 0.29 / C ¹	300 / 0.18 / C ¹
	Knollwood Dr to Cambridge Rd	2 lane arterial	338 / 0.20 / C ¹	281 / 0.17 / C ¹
	Cambridge Rd to Royal Dr	2 lane arterial	283 / 0.17 / C ¹	297 / 0.18 / C ¹



TABLE 5: PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS (ROADWAY SEGMENTS)

Roadway	Segment	Facility Type	Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour
	Royal Dr to Cameron Park Dr	2 lane arterial	215 / 0.13 / C ¹	362 / 0.22 / C ¹
Durock Rd	US 50 to Business Dr ³	2 lane arterial	319 / 0.19 / C ¹	556 / 0.34 / C ¹
	Business Dr to S. Shingle Rd	2 lane arterial	322 / 0.2 / C ¹	547 / 0.33 / C ¹

Notes: ¹ LOS at this location is C or better

²Cambridge Road between Country Club Drive and Oxford Road is allowed to operate at LOS F (maximum V / C / ratio of 1.07) until 2018 per County standard

³Durock Road / Cameron Park Drive between Coach Lane and Robin Lane is allowed to operate at LOS F (maximum V / C ratio of 1.11) until 2018 per County standard.

Volume-to-Capacity ratio and LOS is based on the HCM 2010 peak hour level of service thresholds.

Source: Fehr & Peers, 2018



4.4.3 FREEWAY FACILITIES

Freeway facilities in the County are under the jurisdiction of the California Department of Transportation (Caltrans). In recent years, US 50 and interchanges within or proximate to the study area have undergone or are undergoing various improvements to increase capacity and improve traffic operations. These recently completed improvements include: extension of High Occupancy Vehicle (HOV) lanes east to Cameron Park Drive, modifications to the US 50 / El Dorado Hills Boulevard / Latrobe Road interchange westbound ramps, and the construction of the Silva Valley Parkway interchange. .

Table 6 summarizes existing peak hour freeway operations. All of the study facilities currently operate acceptably. A secondary performance measure, average speed, was used to verify the results shown in Table 6 that are based on the primary performance measure of density. Average midweek (i.e., Tuesday, Wednesday, and Thursday non-holiday) speed data was collected from the Caltrans Performance Measurement System (PeMS) for the period from October 2013 through September 2014. The speed data was collected for general purpose lanes (i.e., not the HOV lane) on eastbound and westbound US 50 near the El Dorado / Sacramento county line. As a secondary performance measure, the PeMS speed data is consistent with and confirms the LOS results shown in Table 6 for the segments of US 50 at the county line. The PeMS data identifies average speeds of 60 and 59 miles per hour on eastbound and westbound US 50, respectively, during peak hours. Detailed LOS analysis sheets are contained in Appendix A. See section 3.1 and Table 3 for a definition of LOS as it relates to freeway facilities.

TABLE 6: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS

Freeway	Segment	Facility Type	Existing Density ¹ / LOS	
			AM	PM
US 50 EB	Latrobe Rd off-ramp	Diverge	22 / C	30 / D
	El Dorado Hills Blvd off-ramp	Diverge	14 / B	26 / C
	Latrobe Rd on-ramp to Silva Valley Pkwy off-ramp	Weave (HCM)	10 / A	24 / C
		Basic ²	7 / A	15 / B
	Silva Valley Pkwy on-ramp (loop)	Merge	11 / B	21 / C
	Silva Valley Pkwy on-ramp to Bass Lake Rd	Basic	11 / A	20 / C
	Bass Lake Rd off-ramp	Diverge	15 / B	25 / C
	Bass Lake Rd on-ramp	Merge	16 / B	27 / C



TABLE 6: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – EXISTING CONDITIONS

Freeway	Segment	Facility Type	Existing Density ¹ / LOS		
			AM	PM	
	Bass Lake Rd on-ramp to Cambridge Rd off-ramp	Basic	14 / B	25 / C	
	Cambridge Rd off-ramp	Diverge	18 / B	30 / D	
	Cambridge Rd on-ramp	Merge	19 / B	26 / C	
	Cambridge Rd off-ramp	Diverge	28 / C	23 / C	
	Cambridge Rd on-ramp	Merge	20 / B	13 / B	
	Cambridge Rd on-ramp to Bass Lake Rd off-ramp	Basic	23 / C	17 / B	
	Bass Lake Rd off-ramp	Diverge	29 / D	21 / C	
	Bass Lake Rd on-ramp	Merge	32 / D	21 / C	
	US 50 WB	Bass Lake Rd on-ramp to lane add	Basic	29 / D	17 / B
		Lane add to Silva Valley Pkwy off-ramp	Basic	19 / C	12 / B
Silva Valley Pkwy off-ramp		Diverge	13 / B	5 / A	
Silva Valley Pkwy on-ramp to El Dorado Hills Blvd off-ramp		Weave (HCM)	35 / D	18 / B	
		Basic ²	19 / C	11 / A	
El Dorado Hills Blvd on-ramp		Merge	34 / D	24 / C	

Notes: ¹Density reported as passenger cars per mile per lane. Density is not reported for LOS F operations. Analysis based on HCM 2010.

²Out of realm of weaving of Leisch analysis; analyzed as a basic segment

Source: Fehr & Peers, 2018



4.5 PEDESTRIAN CIRCULATION

Attached or landscape-separated detached sidewalks are provided intermittently throughout the project study area. Given the primarily rural residential nature of El Dorado Hills and Cameron Park, it is not necessarily the desire to provide sidewalks in all areas. That said, some of the following major roadway facilities lack sidewalks and result in pedestrian network gaps:

- Both sides of Bass Lake Road from US 50 to Hollow Oak Drive; however, this area currently serves only a few large residential parcels with no services within walking distance.
- Both sides of Country Club Drive west of Trinidad Drive; however, there are limited land uses that would benefit from sidewalks near the street.
- Sidewalk is also missing on the south side of Country Club Drive between Merry Chase Drive and opposite Placitas Drive (Cameron Park Library driveway). This segment is adjacent to Blue Oak Elementary / Charter Montessori School and Camerado Springs Middle School.
- Country Club Drive lacks sidewalk from approximately 300 feet east of Placitas Drive to 200 west of Cameron Park Drive.
- Cambridge Road and Flying "C" Road (south of US 50) lack sidewalk except for the east side near the US 50 interchange.

Most study intersections are unsignalized without physical pedestrian features such as curb ramps and marked crosswalks. The three signalized study intersections do provide controlled pedestrian crossings or are otherwise restricted. As described in Section 4.6 below, Class I bicycle paths double as pedestrian facilities. For example, the Class I path along the east side of Bass Lake Road between Hollow Oak Drive and Serrano Parkway provide redundant pedestrian facilities to the detached sidewalk on the west side.



4.6 BICYCLE CIRCULATION

Existing and proposed bicycle facilities within the study area are displayed in Figure 5. Bicycle facilities can be classified into three categories.

- Class I Bicycle Path– Off-street bike paths within exclusive right-of-way; usually shared with pedestrians
- Class II Bicycle Lane – Striped on-road bike lanes adjacent to the outside travel lane on preferred corridors for biking
- Class III Bicycle Route– Shared on-road facility, usually delineated by signage and pavement markings

According to the *El Dorado Bicycle Transportation Plan, 2010 Update (El Dorado County Transportation Commission)*, mapping information provided by the County, and field observations, the following major bikeway facilities are present within the study area:

- Class II bicycle lanes on Serrano Parkway , White Rock Road, Latrobe Road and portions of Silva Valley Parkway, Country Club and El Dorado Hills Drive
- Class I bicycle path, Bass Lake Road (Hollow Oak Drive to Serrano Parkway), New York Creek Nature Trail, which is adjacent to El Dorado Hills Drive on the east side between Serrano Parkway to St Andrews Drive

Figure 5 identifies existing and planned bikeways presented in the *El Dorado Bicycle Transportation Plan, 2010 Update and the Sacramento Area Council of Governments (SACOG) Metropolitan Transportation Plan / Sustainable Communities Strategy (MTP / SCS) for 2035*.



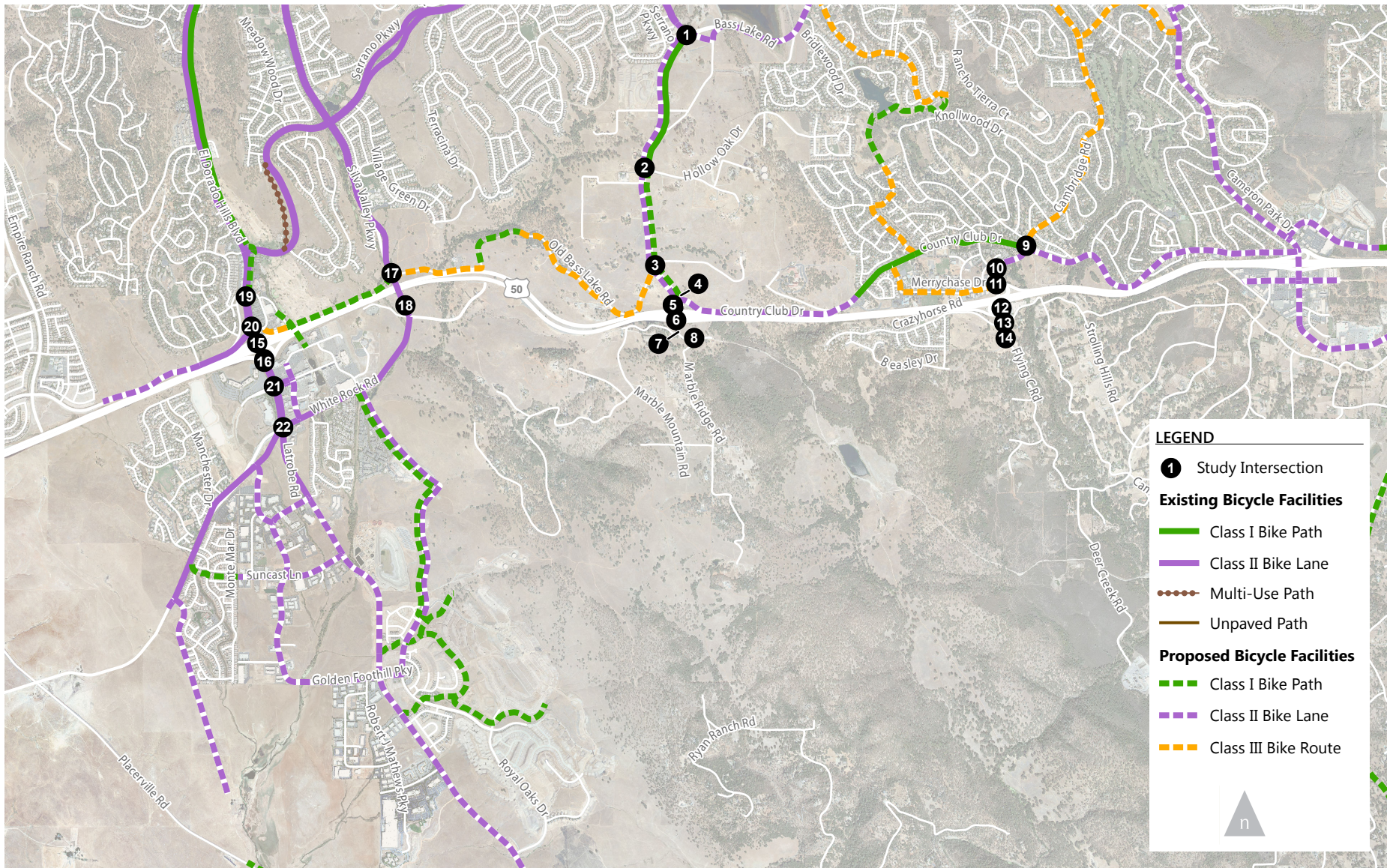


Figure 5.

Bicycle Facilities

4.7 TRANSIT

El Dorado County Transit Authority (El Dorado Transit) provides public transit service within the project area. El Dorado Hills is currently served by El Dorado Transit Dial-A-Ride services, Commuter Service, and the Iron Point Connector Route. Both the Commuter Service and the Iron Point Connector Route serve only the El Dorado Hills Park-and-Ride Lot and do not circulate within the community.

In May 2013, The EDCTC completed the *El Dorado Hills Community Transit Needs Assessment and US 50 Corridor Operations Plan* (Plan), which explores how the recent growth and projected development impact the need for transit services, and identifies the most appropriate type and level of service needed given the demand. All three services are addressed in the Plan and are described briefly below.

- **Dial-A-Ride** service is a demand response service designed for seniors and disabled passengers, with limited access available for the general public. The service is available on a first-come, first-serve basis Monday through Friday between the hours of 7:30 AM and 5:00 PM, and between 8:00 AM and 5:00 PM on Saturdays and Sundays. El Dorado Hills is one of twelve geographic zone service areas.
- **Commuter Service** is offered Monday through Friday between El Dorado County and downtown Sacramento. Morning departures from El Dorado County locations are scheduled from 5:10 AM to 8:00 AM, and afternoon eastbound departures from Sacramento occur from 2:40 PM to 6:00 PM. A reverse commuting service is offered. The El Dorado Hills Park-and-Ride located in Town Center at the White Rock Road / Post Street intersection is the nearest stop location for the project. According to the Plan, nearly half of commute passengers boarded at the El Dorado Hills Park-and-Ride in the mornings, which makes this location the highest boarding stop offered as part of the Commuter Service.
- **Iron Point Connector (IPC) Route** provides direct service from El Dorado County to Folsom with connections to Sacramento Regional Transit light rail on weekdays. This route runs twice in the morning and twice in the afternoon from the Central Transit Center to the Iron Point Light Rail Station in Folsom. The El Dorado Hills Park-and-Ride located in Town Center at the White Rock Road / Post Street intersection is the nearest stop location for the project.
- **Cameron Park Route** is a fixed-route service, which begins at the Missouri Flat Transfer Center in Placerville, serves the Folsom Lake College / El Dorado Center, then continues to Cameron Park. After serving Cameron Park in a clockwise direction, the route serves the Cambridge Park-and-Ride and returns via Country Club Drive. The Cameron Park Route operates four runs daily and



one morning express run with limited stops. Deviations are not permitted on the express run. Monthly ridership was 3,000 passengers for fiscal year 2011-2012.³

The El Dorado Hills Park-and-Ride lot provides 120 parking spaces. The Plan reports that parking demand exceeds supply. Specifically, Table 19 of the Plan reports 108-percent parking utilization in 2005 for the El Dorado Park-and-Ride based on Sacramento Area Council of Governments and Caltrans data. Similarly, the Cambridge Road Park-and-Ride lot was reported to have 142-percent parking utilization in 2005; however, this lot was expanded in size in 2006.

The Plan also describes other transit providers that serve western El Dorado County, including the Senior Shuttle Program which has recently initiated service in El Dorado Hills.

³ Ridership data derived from El Dorado Transit Administrative Operations Reports, July-December 2010; Summary report January-June, 2011 presented in the El Dorado Hills Community Transit Needs Assessment and US 50 Corridor Operations Plan, May 2013.



5.0 EXISTING PLUS PROJECT CONDITIONS

5.1 TRIP GENERATION

Based on information contained in the Notice of Preparation and subsequent correspondence with County staff and the applicant, Fehr & Peers prepared trip generation estimates for the project based on methodologies and trip rates presented in Trip Generation, 9th Edition (Institute of Transportation Engineers), with adjustments to account for internal vehicle trips and walking trips given the mix of land use proposed and the location of the project relative to other services.

This traffic study determined that the combined effects of the Project's land use, location, and development scale would contribute to a reduction in off-site average weekday vehicle "trips" (e.g., one vehicle trip is when a person drives from their home to shopping or their job. Their return drive home is another trip). This reduction is due largely to the Project's proximity to commercial and retail services and connections between the project and these services. That is, most of the reduction in total off-site vehicle trips generated by the Project is attributable to those trips beginning on the Project site, traveling to adjacent services, and ending on the Project site without using off-site roadways or by walking.

Traditionally, traffic engineers and transportation planners have estimated internalization of project trips using one of two methods. First, they would estimate it based on their professional judgment. Alternatively, professionals relied on the Institute of Transportation Engineers' (ITE) internalization methodology presented in the ITE Trip Generation Handbook. Although this has been applied in thousands of studies in California, the methodology was limited as it was based on only six surveys in Florida. Additionally, the ITE internalization methodology only accounts for the land use types on the mixed-use site. Given the limited input information (land use amount and type) and the limited range of data (six surveys), the accuracy of the internalization estimates has recently been found to generally under-estimate internalization of trips from mixed-use projects.

Recognizing the limitations of the simplified methodology applied in the ITE handbook, the United States Environmental Protection Agency commissioned a study to develop a more substantial, statistically superior methodology. This methodology, identified as MXD (or mixed-use development trip generation), begins with ITE rates and developed trip internalization estimates based on a series of factors tied to numerous site attributes. It should also be noted that the MXD model has been developed in cooperation with the US Environmental Protection Agency (EPA) and ITE and that ITE is currently reviewing the model for potential inclusion in their updated recommended practice for evaluating MXD projects. The MXD methodology is described in greater detail below.



MXD Trip Internalization Methodology

The internal capture percentage reported is not an "assumed" number, but rather is a number that was derived using a best practices trip generation model designed specifically for mixed-use development (MXD) projects and estimates trip generation and internal capture by adjusting trip generation rates to account for the influence of built environment variables. A variety of research studies have demonstrated that these variables influence vehicle trip generation.

The MXD model used was developed based on household travel survey data obtained from 239 existing mixed-use developments in six metropolitan regions throughout the U.S., including developments in Sacramento. The internal capture percentage calculated for the project is reflective of the land uses that would be developed as part of the Project and land use near the project, which would reduce the need to travel beyond the Project site or surrounding area. A set of 16 independent mixed use sites that were not included in the initial model were tested to help validate the model. Among the validation sites, use of the MXD model produced superior statistical performance when comparing the model results to observed data. Given the statistical robustness of the MXD model, it was deemed the most appropriate approach for estimating internalization of project trips.

MXD Model Inputs and Trip Generation Estimates

To determine the amount of trips that would be internal to the Project site, an MXD trip generation estimate was prepared. The MXD analysis first begins with gross trip rates identified in the Institute of Transportation Engineers' Trip Generation (9th Edition, 2012). It then incorporates the MXD methodology for "matching" trips to estimate the amount of internalization within the project site. Table 7 summarizes project land use, assumed trip rates, calculated trip generation totals, and MXD adjustments.

The entire project is projected to generate about 31,020 daily vehicle trips, 2,380 AM peak hour vehicle trips and 3,360 PM peak hour vehicle trips. The daily total includes a reduction of about 8,700 vehicle trips for internalization, which are vehicle trips made that remain within the project site, which includes internalization school trips and local-serving retail trips. Please note that school trip internalization was capped at 75% (75% of all school trips will stay internal to the site) and internalization of local-serving retail trips was capped at 60%. The reduction in schools trips is most notable in the AM peak hour. An additional reduction of 14 vehicle trips was made in acknowledgement of feasible walking trips in lieu of vehicle trips.



TABLE 7: TRIP GENERATION – MARBLE VALLEY

Land Use	Quantity	ITE Code	Trip Rate			Trips						
			Daily	AM	PM	Daily	AM			PM		
							In	Out	Total	In	Out	Total
Multifamily Housing (Dwelling Units)	501	220	6.65	0.51	0.62	3,332	51	205	256	202	109	311
Single Family Detached Housing (Dwelling Units)	2,735	210	9.52	0.75	1.00	26,037	513	1,538	2,051	1,723	1,012	2,735
Office Park (1,000 Square Feet) ¹	375	710	9.56	1.47	1.33	3,585	485	66	551	85	413	498
Village Commercial (1,000 Square Feet)	100	820	42.70	0.96	3.71	4,270	60	36	96	178	193	371
Middle School (Enrollment) ²	779	522	1.62	0.54	0.16	1,262	227	194	421	62	63	125
Elementary School (Enrollment) ²	614	520	1.29	0.45	0.15	792	152	124	276	45	47	92
Agriculture Tourism (Employees)	20	710	11.03	1.56	1.49	221	27	4	31	5	25	30
Village Park (Acres)	47	412	2.28	0.02	0.09	107	1	0	1	3	1	4
Gross Trips						39,606	1,516	2,167	3,683	2,303	1,863	4,166
Internal Capture						8,703	497	494	991	405	405	809
Walking Trips						14	1	1	2	1	1	2



TABLE 7: TRIP GENERATION – MARBLE VALLEY

Land Use	Quantity	ITE Code	Trip Rate			Trips						
			Daily	AM	PM	Daily	AM			PM		
							In	Out	Total	In	Out	Total
Net Trips Made by Motor Vehicle						30,889	1,018	1,672	2,690	1,897	1,457	3,355

Notes: ¹Trip generation developed using regression equation and equivalent trip generation rates are reported.

²School enrollment is based on enrollment at existing elementary and middle schools in El Dorado Hills and Cameron Park. (Elementary Schools: Oak Meadow Elementary, William Brooks Elementary and Blue Oak Elementary, Middle Schools: Camerado Springs Middle School and Rolling Hills Middle School).

Source: Trip Generation, 9th Edition (Institute of Transportation Engineers)



5.2 TRIP DISTRIBUTION AND ASSIGNMENT

The expected distribution of project trips is shown on Figure 6. The distribution was developed using the following sources and analytical techniques:

- Existing travel patterns based on the existing traffic counts
- Traffic assignment using the validated base year El Dorado County travel demand forecasting model
- Project access and internal circulation

As shown on Figure 6, the largest share of project trips (61 percent) will use US 50 to / from the west in the morning and evening with 23 percent traveling on US 50 to / from the east. Travel to / from the north on Bass Lake Road is 7 percent. Figure 7 shows only project trips based on the trip distribution shown on Figure 6. The resulting AM and PM peak hour traffic volumes under existing plus project conditions are presented on Figure 8.



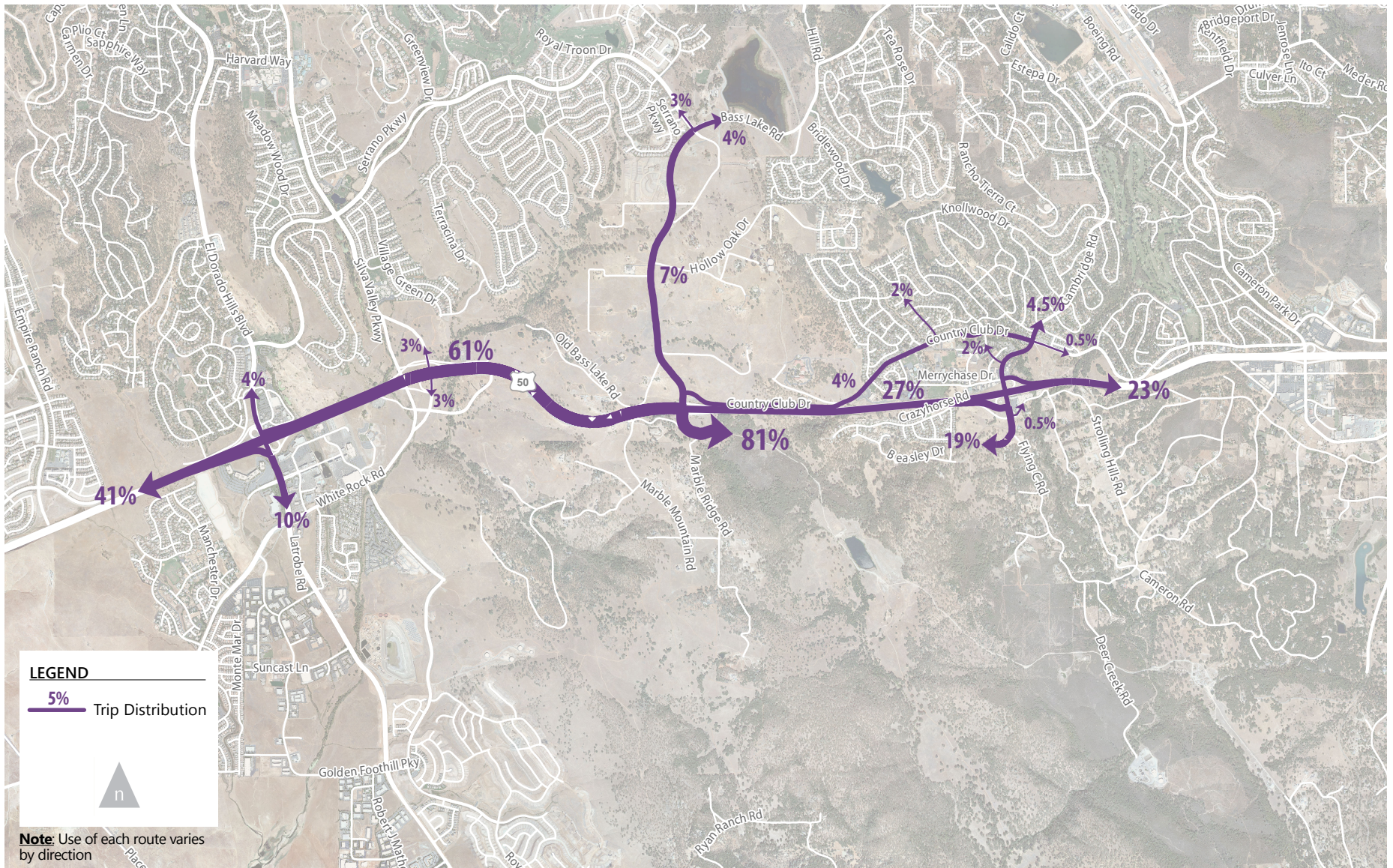
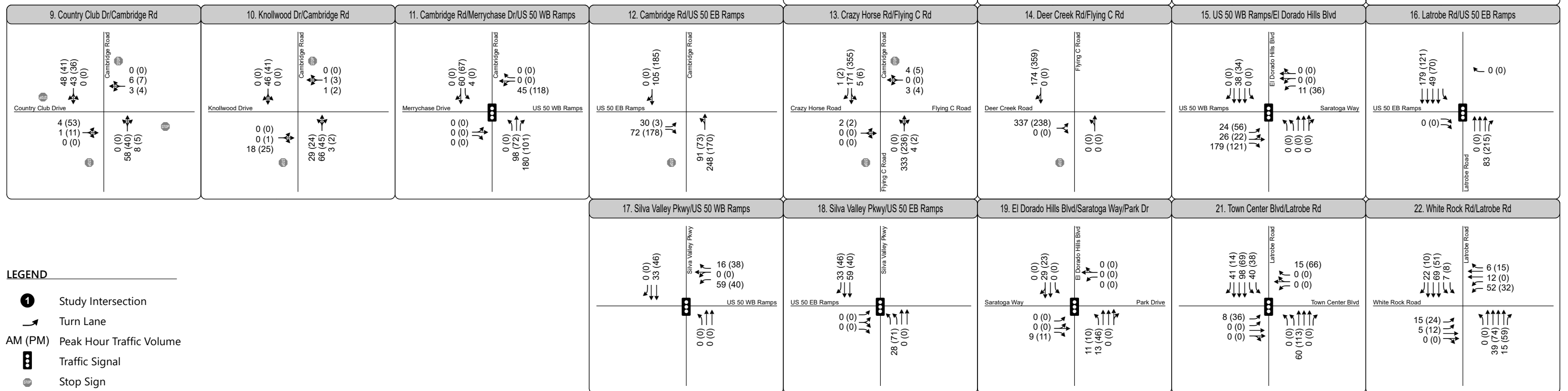
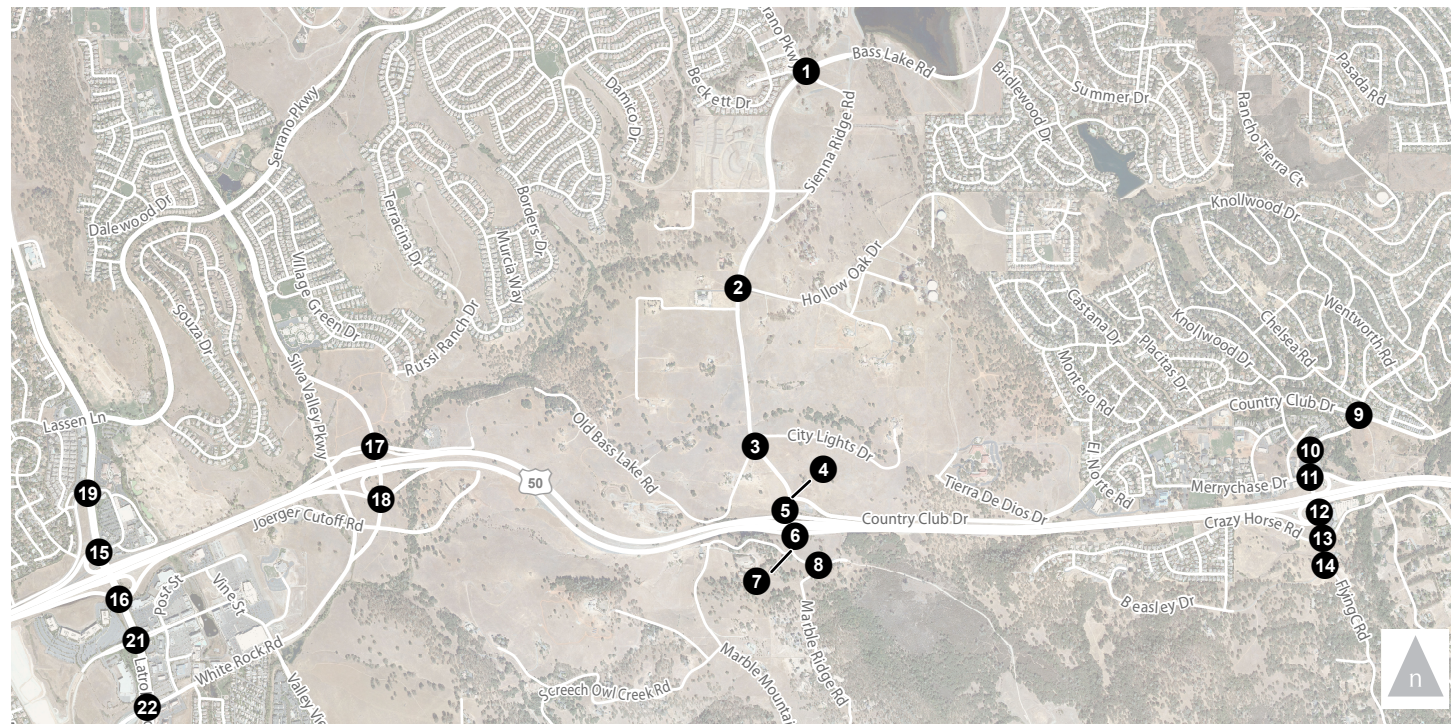


Figure 6.

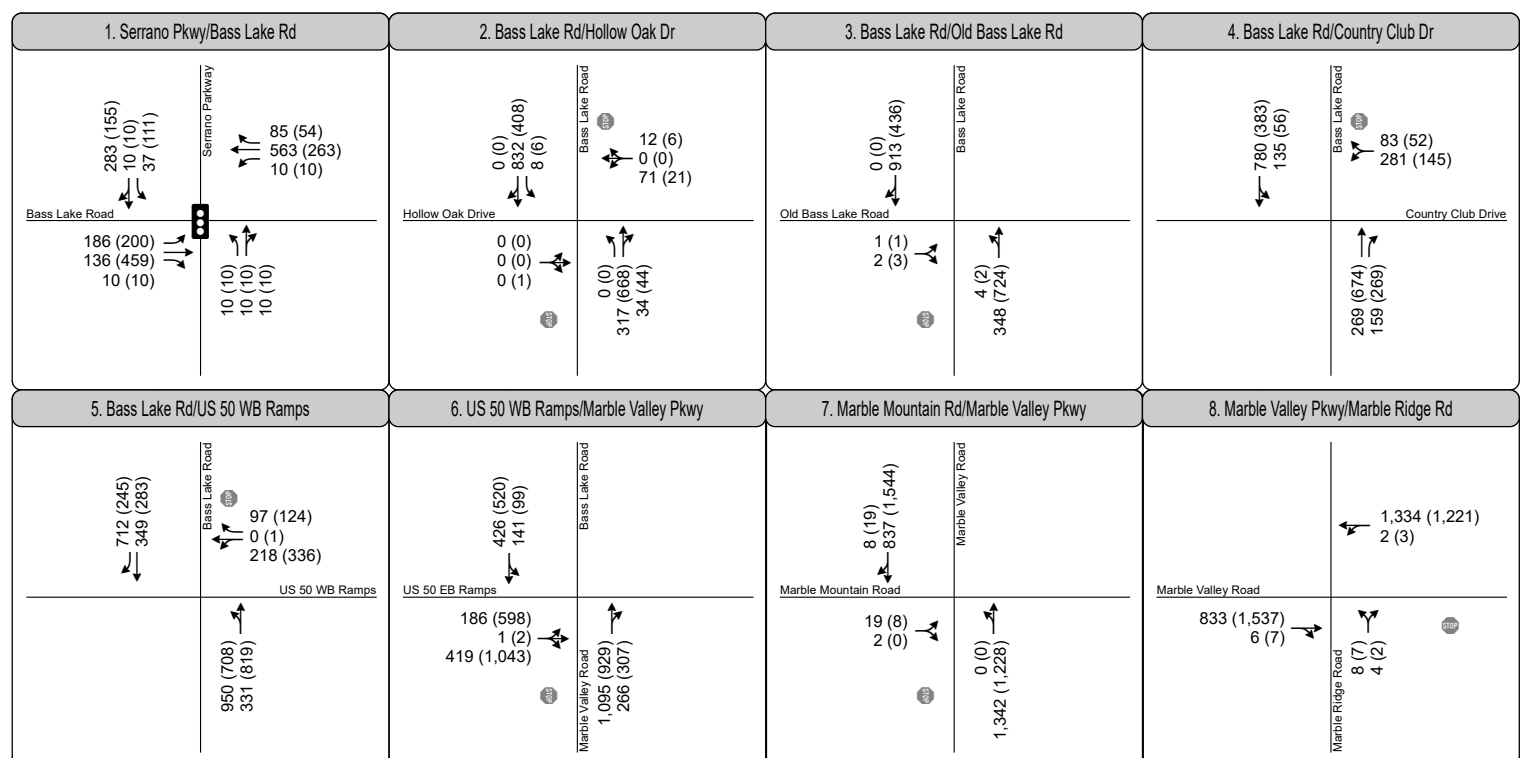
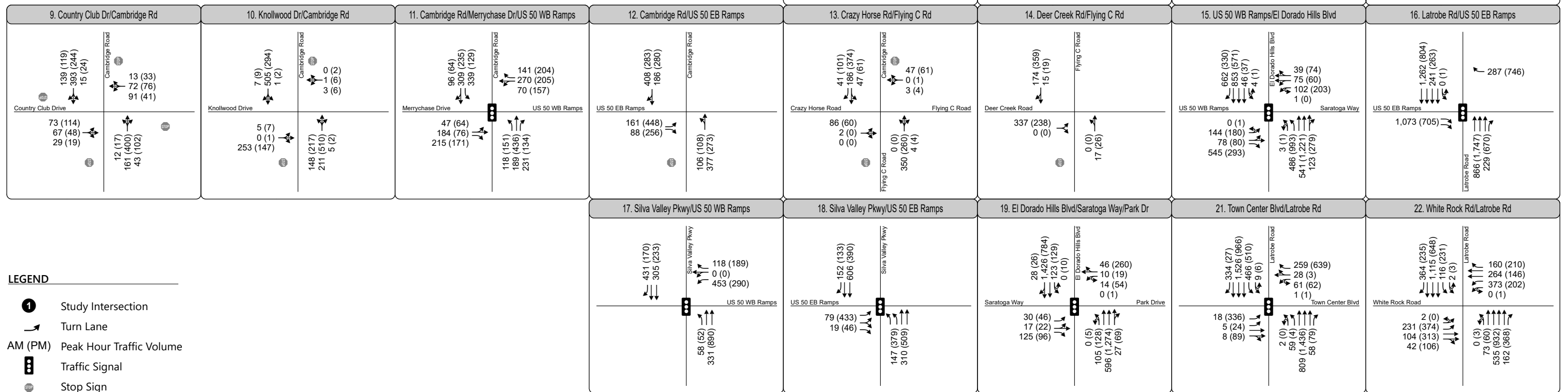
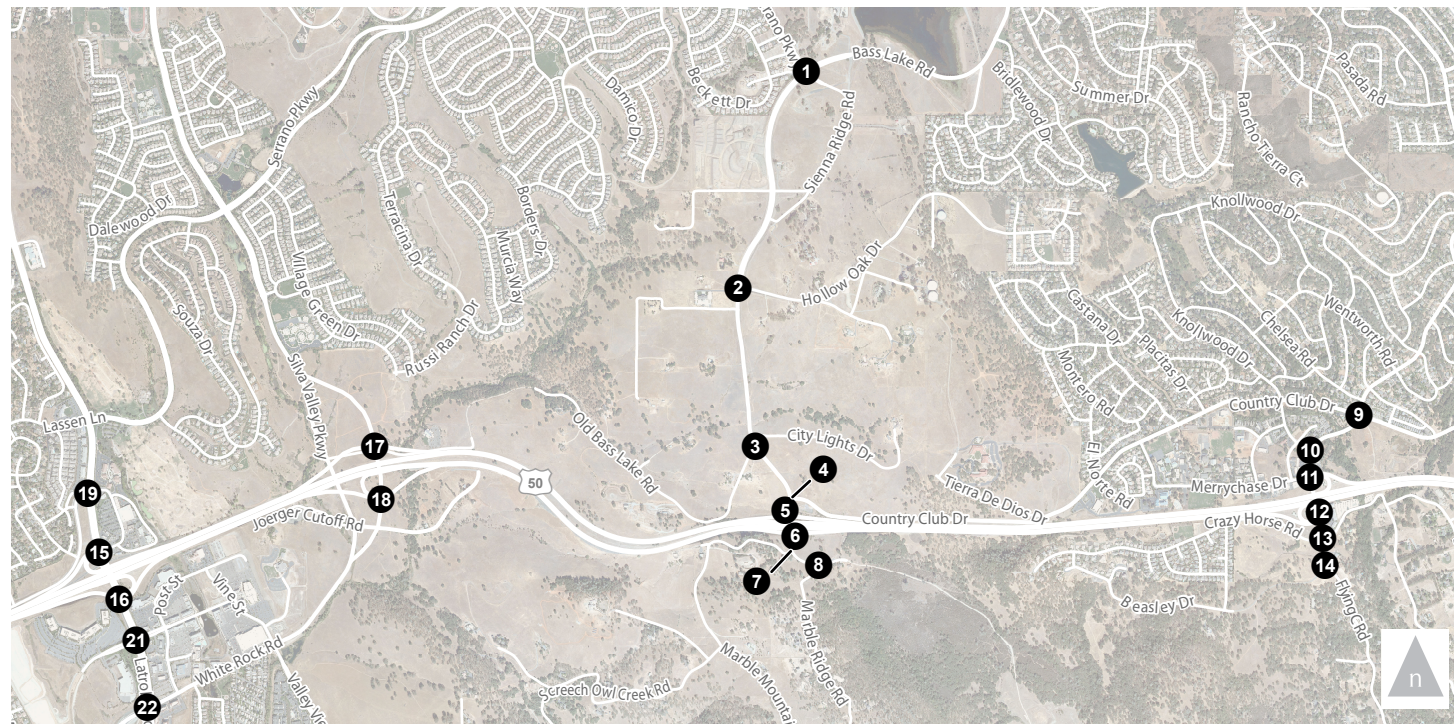
Marble Valley Trip Distribution



LEGEND

- 1 Study Intersection
- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign

Figure 7.
Peak Hour Traffic Volumes and Lane Configurations -
Project Only Trip Assignment



LEGEND

- Study Intersection
- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign

Figure 8.
**Peak Hour Traffic Volumes and Lane Configurations -
 Existing Plus Project Conditions**

5.3 PEAK HOUR VEHICLE LEVEL OF SERVICE

5.3.1 INTERSECTIONS

Analysis results, which are presented in Table 8, indicate that many of the study intersections that are stop controlled will operate unacceptably with increased traffic from build-out of the proposed project added to existing conditions. Traffic generated by the project result in potential impacts at the following locations:

- Bass Lake Road / Country Club Drive (Intersection 4) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates unacceptably at LOS F without the project during the AM peak hour and acceptably at LOS C during the PM peak hour. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM peak hour operations. The project would also result in unacceptable (LOS F) conditions during the PM peak hour.
- Bass Lake Road / US 50 westbound ramps (Intersection 5) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS B and LOS C during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours.
- Bass Lake Road / US 50 eastbound ramps (Intersection 6) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS C during the AM peak hour and unacceptably at LOS F during the PM peak hour without the project. The project would also result in unacceptable (LOS F) conditions during the AM peak hour, and according to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the PM peak hour.
- Marble Valley Parkway / Marble Mountain Road (Intersection 7) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS A without the project during the AM and PM peak hours. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours.
- Marble Valley Parkway / Marble Ridge Road (Intersection 8) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS A without the project during the AM and PM peak hours. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours.
- Cambridge Road / Country Club Drive (Intersection 9) – This intersection operates acceptably at LOS E and C during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the AM peak hour.



- Cambridge Road / Knollwood Drive (Intersection 10) – This intersection operates unacceptably at LOS F during the AM peak hour and acceptably at LOS E during the PM peak hour without the project. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM peak hour. The project would also result in unacceptable (LOS F) conditions during the PM peak hour.
- Cambridge Road / US 50 eastbound ramps (Intersection 12) – This intersection operates acceptably at LOS B and E during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours.
- Cambridge Road / Flying C Road / Crazy Horse Road (Intersection 13) – This intersection operates acceptably at LOS B during the AM and PM peak hours without the project. The project results in unacceptable (LOS F) conditions during the AM peak hour.
- Latrobe Road / Town Center Boulevard (Intersection 20) – This intersection operates acceptably at LOS B and D during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the PM peak hour.
- Latrobe Road / White Rock Road (Intersection 21) – This intersection operates acceptable at LOS C during both the AM and PM peak hours without the project. The project results in unacceptable (LOS F) conditions during the PM peak hour, due to poor lane utilization that causes vehicle queue spillback on the northbound through movement (i.e., the one through lane that continues through the interchange) from the Latrobe Road / Town Center Boulevard interchange.



TABLE 8: INTERSECTION LOS AND DELAY – EXISTING PLUS PROJECT CONDITIONS

Intersection	LOS Target	Control	Existing Conditions (LOS / Delay)		Existing Plus Project (LOS / Delay)	
			AM	PM	AM	PM
1. Bass Lake Road / Serrano Parkway	E	Signal	C / 20	B / 18	D / 41	B / 19
2. Bass Lake Road / Hollow Oak Drive	E	SSSC	C / 20	B / 14	D / 26	D / 27
3. Bass Lake Road / Old Bass Lake Road	D	SSSC	C / 20	B / 12	D / 26	B / 14
4. Bass Lake Road / Country Club Drive	D	SSSC	F / >180	C / 22	<u>F / > 180</u>	<u>F / 129</u>
5. Bass Lake Road / US WB 50 Ramps	D	SSSC	B / 11	C / 16	<u>F / > 180</u>	<u>F / > 180</u>
6. Bass Lake Road / US EB 50 Ramps	D	SSSC	C / 20	F / 58	<u>F / > 180</u>	<u>F / > 180</u>
7. Marble Valley Parkway / Marble Mountain Road	D	SSSC	A / 9	A / 9	<u>F / > 180</u>	<u>F / > 180</u>
8. Marble Valley Parkway / Marble Ridge Road	D	SSSC	A / 9	A / 9	<u>F / > 180</u>	<u>F / > 180</u>
9. Cambridge Road / Country Club Drive	E	AWSC	E / 39	C / 18	<u>F / 88</u>	E / 39
10. Cambridge Road / Knollwood Drive	E	SSSC	F / 82	E / 41	<u>F / 164</u>	<u>F / 77</u>
11. Cambridge Road / Merrychase Drive / US 50 WB Ramps	E	Signal	D / 54	C / 28	E / 66	D / 36
12. Cambridge Road / US 50 EB Ramps	E	SSSC	B / 14	E / 45	<u>F / 108</u>	<u>F / > 180</u>
13. Cambridge Road / Flying C Road / Crazy Horse Road	E	SSSC	B / 12	B / 11	<u>F / > 180</u>	D / 29



TABLE 8: INTERSECTION LOS AND DELAY – EXISTING PLUS PROJECT CONDITIONS

Intersection	LOS Target	Control	Existing Conditions (LOS / Delay)		Existing Plus Project (LOS / Delay)	
			AM	PM	AM	PM
14. Flying C Road / Marble Valley Parkway	E	SSSC	A / 0	A / 0	B / 12	B / 13
15. El Dorado Hills Boulevard / US 50 WB Ramps / Saratoga Way	E	Signal	C / 31	C / 33	C / 31	C / 34
16. Latrobe Road / US 50 EB Ramps	E	Signal	C / 33	C / 20	C / 32	C / 25
17. Silva Valley Parkway / US 50 WB Ramps	E	Signal	B / 11	A / 10	B / 11	A / 10
18. Silva Valley Parkway / US 50 EB Ramps	E	Signal	B / 11	B / 13	B / 11	B / 13
19. El Dorado Hills Boulevard / Park Drive / Saratoga Way	E	Signal	B / 19	C / 20	C / 21	B / 20
21. Latrobe Road / Town Center Drive	E	Signal	B / 16	D / 50	B / 18	<u>F / 88</u>
22. Latrobe Road / White Rock Road	E	Signal	C / 31	C / 27	C / 32	<u>F / 142</u>

Notes: SSSC = side-street stop-control, AWSC = all-way stop control

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

The average delay is measured in seconds per vehicle. For signalized and AWSC intersections, the delay shown is the average control delay for the overall intersection. For SSSC intersections, the LOS and control delay for the worst movement is shown.

Intersection LOS and delay is calculated based on the procedures and methodology contained in the *HCM* (2000). Intersections 1-14, 17, and 18 are analyzed in Synchro. Intersections 15-16 and 19-22 are analyzed in SimTraffic.

Source: Fehr & Peers, 2018



5.3.2 ROADWAY SEGMENTS

Analysis results, which are presented in Table 9, indicate that all study roadway segments will operate acceptably. Traffic generated by the project is not anticipated to result in roadway segment impacts according to established significance criteria. A comparison of the results in Table 9 to the results in Table 8 shows that the number of through travel lanes on the study area roadways is adequate, but that improvements are needed at intersections, which are the locations where drivers experience delay traveling through the study area.

5.3.3 FREEWAY FACILITIES

Analysis results, which are presented in Table 10, indicate that all but three study freeway facilities will operate acceptably. Traffic generated by project buildout would result in LOS F conditions at the US 50 westbound on-ramp from Bass Lake Road, the westbound weave section between the Silva Valley Parkway and El Dorado Hills Boulevard interchanges, and the westbound on-ramp from El Dorado Hills Boulevard.



TABLE 9: ROADWAY SEGMENT PEAK HOUR LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS

Roadway	Segment	Facility Type	Existing Volume / Volume – Capacity (V / C) Ratio / LOS		Existing + Project Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Bass Lake Rd	Green Valley Rd to Bridlewood Dr	2 lane arterial	503 / 0.30 / C ¹	486 / 0.29 / C ¹	530 / 0.32 / C ¹	510 / 0.31 / C ¹
	Bridlewood Dr to Serrano Pkwy	2 lane arterial	726 / 0.44 / C ¹	772 / 0.47 / C ¹	820 / 0.50 / C ¹	890 / 0.54 / C ¹
	Serrano Pkwy to Hollow Oak Dr	2 lane arterial	933 / 0.57 / D	869 / 0.53 / D	1,170 / 0.71 / D	1,090 / 0.66 / D
	Hollow Oak Dr to Country Club Dr	2 lane arterial	1,023 / 0.62 / D	928 / 0.56 / D	1,270 / 0.77 / D	1,160 / 0.70 / D
	Country Club Dr to US 50	2 lane arterial	1,128 / 0.68 / D	1,067 / 0.65 / D	1,490 / 0.90 / D	1470 / 0.89 / D
Cambridge Rd	Green Valley Rd to Oxford Rd	2 lane arterial	381 / 0.23 / C ¹	394 / 0.24 / C ¹	410 / 0.25 / C ¹	430 / 0.26 / C ¹
	Oxford Rd to Knollwood Dr ²	2 lane arterial	641 / 0.39 / C ¹	764 / 0.46 / C ¹	710 / 0.43 / C ¹	830 / 0.50 / C ¹
	Knollwood Dr to Country Club Dr ²	2 lane arterial	617 / 0.37 / C ¹	738 / 0.45 / C ¹	770 / 0.47 / C ¹	910 / 0.55 / C ¹
	Country Club Dr to US 50	2 lane arterial	959 / 0.58 / D	993 / 0.60 / D	1,120 / 0.68 / D	1,130 / 0.68 / D
Cameron Park Dr	Green Valley Rd to Alhambra Dr	2 lane arterial	654 / 0.40 / C ¹	793 / 0.48 / C ¹	660 / 0.40 / C ¹	800 / 0.48 / C ¹
	Alhambra Dr to Oxford Rd	2 lane arterial	1,211 / 0.73 / D	1,434 / 0.87 / D	1,220 / 0.74 / D	1,450 / 0.88 / D
	Oxford Rd to Hacienda Dr	2 lane arterial	1,080 / 0.65 / D	1,612 / 0.98 / E	1,080 / 0.65 / D	1,615 / 0.98 / E



TABLE 9: ROADWAY SEGMENT PEAK HOUR LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS

Roadway	Segment	Facility Type	Existing Volume / Volume – Capacity (V / C) Ratio / LOS		Existing + Project Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
	Hacienda Dr to US 50	4 lane undivided arterial	1,084 / 0.35 / C ¹	1,636 / 0.52 / C ¹	1,090 / 0.35 / C ¹	1,670 / 0.53 / C ¹
Country Club Dr	Bass Lake Rd to Merrychase Dr	2 lane arterial	518 / 0.31 / C ¹	310 / 0.19 / C ¹	560 / 0.34 / C ¹	430 / 0.26 / C ¹
	Merrychase Dr to Knollwood Dr	2 lane arterial	481 / 0.29 / C ¹	300 / 0.18 / C ¹	520 / 0.32 / C ¹	410 / 0.25 / C ¹
	Knollwood Dr to Cambridge Rd	2 lane arterial	338 / 0.20 / C ¹	281 / 0.17 / C ¹	350 / 0.21 / C ¹	350 / 0.21 / C ¹
	Cambridge Rd to Royal Dr	2 lane arterial	283 / 0.17 / C ¹	297 / 0.18 / C ¹	300 / 0.18 / C ¹	320 / 0.19 / C ¹
	Royal Dr to Cameron Park Dr	2 lane arterial	215 / 0.13 / C ¹	362 / 0.22 / C ¹	220 / 0.13 / C ¹	360 / 0.22 / C ¹
Durock	US 50 to Business Dr ³	2 lane arterial	319 / 0.19 / C ¹	556 / 0.34 / C ¹	340 / 0.21 / C ¹	580 / 0.35 / C ¹
	Business Dr to S. Shingle Rd	2 lane arterial	322 / 0.2 / C ¹	547 / 0.33 / C ¹	330 / 0.20 / C ¹	560 / 0.34 / C ¹

Notes: ¹LOS at this location is C or better.

²Cambridge Road between Country Club Drive and Oxford Road is allowed to operate at LOS F (maximum V / C / ratio of 1.07) until 2018 per County standard

³Durock Road / Cameron Park Drive between Coach Lane and Robin Lane is allowed to operate at LOS F (maximum V / C ratio of 1.11) until 2018 per County standard.

Volume-to-Capacity ratio and LOS is based on the HCM 2010 peak hour level of service thresholds.

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

Source: Fehr & Peers, 2018



TABLE 10: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS

Freeway	Segment	Facility Type	Existing Density ¹ /LOS		Existing + Project Density ¹ /LOS	
			AM	PM	AM	PM
US 50 EB	Latrobe Rd off-ramp	Diverge	22 / C	30 / D	24 / C	33 / D
	El Dorado Hills Blvd off-ramp	Diverge	14 / B	26 / C	16 / B	30 / D
	Latrobe Rd on-ramp to Silva Valley Pkwy off-ramp	Weave (HCM)	10 / A	24 / C	13 / B	31 / D
		Weave (Leisch)	-.2	-.2	-.2	- / C
		Basic	7 / A	15 / B	9 / A	-
	Silva Valley Pkwy on-ramp	Merge	11 / B	21 / C	14 / B	26 / C
	Silva Valley Pkwy on-ramp to Bass Lake Rd off-ramp	Basic	11 / A	20 / C	14 / B	26 / C
	Bass Lake Rd off-ramp	Diverge	15 / B	25 / C	19 / B	32 / D
	Bass Lake Rd on-ramp	Merge	16 / B	27 / C	19 / B	31 / D
	Bass Lake Rd on-ramp to Cambridge Rd off-ramp	Basic	14 / B	25 / C	17 / B	29 / D
	Cambridge Rd off-ramp	Diverge	18 / B	30 / D	22 / C	34 / D
	Cambridge Rd on-ramp	Merge	19 / B	26 / C	22 / C	29 / D
	US 50 WB	Cambridge Rd off-ramp	Diverge	28 / C	23 / C	30 / D
Cambridge Rd on-ramp		Merge	20 / B	13 / B	23 / C	16 / B
Cambridge Rd on-ramp to Bass Lake Rd off-ramp		Basic	23 / C	17 / B	27 / D	20 / C
Bass Lake Rd off-ramp		Diverge	29 / D	21 / C	32 / D	25 / D
Bass Lake Rd on-ramp		Merge	32 / D	21 / C	- / F	27 / C



TABLE 10: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS

Freeway	Segment	Facility Type	Existing Density ¹ / LOS		Existing + Project Density ¹ / LOS	
			AM	PM	AM	PM
	Bass Lake Rd on-ramp to lane add	Basic	29 / D	17 / B	44 / E	23 / C
	Lane add to Silva Valley Pkwy off-ramp	Basic	19 / C	12 / B	24 / C	16 / B
	Silva Valley Pkwy off-ramp	Diverge	13 / B	5 / A	18 / B	11 / B
	Silva Valley Pkwy on-ramp to El Dorado Hills Blvd off-ramp	Weave (HCM)	34 / D	18 / B	<u>- / F</u>	25 / C
		Weave (Leisch)	- ²	- ²	- / E	- ²
		Basic	19 / C	11 / A	-	14 / B
	El Dorado Hills Blvd on-ramp	Merge	34 / D	24 / C	<u>- / F</u>	28 / D

Notes: ¹Density reported as passenger cars per mile per lane. Density is not reported for LOS F operations. Analysis based on HCM 2010.

²Out of realm of weaving for Leisch analysis; analyzed as a basic segment

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

Source: Fehr & Peers, 2018



5.4 PEDESTRIAN CIRCULATION

The project proposes pedestrian facilities by implementing a comprehensive network of pedestrian trails and pathways to provide connectivity among land uses for non-motorized transportation and public recreational enjoyment throughout the 4-mile long valley. The proposed trails are designed as paved Class I multi-use paths along the three primary roadways of Marble Valley Parkway, Marble Lake Boulevard (nicknamed "The Gateway Mile") and Lime Rock Valley Road to serve the proposed residential, commercial, and public facilities in the northern half of the community. Less formal trails are proposed to traverse the preserved open space areas. Pathways will lead to the proposed Foundation Regional Park in the southern portion of the community and a Class I bike path will connect through the proposed Lime Rock Valley Specific Plan to the El Dorado Trail.

5.5 BICYCLE CIRCULATION

The project proposes bicycle facilities by implementing Class I multi-use paths and Class II bicycle lanes along the major transportation corridors, particularly in the northern portion of the project. Less formal trails are proposed to traverse the preserved open space areas. Pathways will lead to the proposed Foundation Regional Park in the southern portion of the community and a Class I bike path will connect through the proposed Lime Rock Valley Specific Plan to the El Dorado Trail.

5.6 TRANSIT

As described above, the project will provide bicycle and pedestrian connections to existing and planned bicycle and pedestrian facilities and will provide a 100 to 120 space park-n-ride lot. To accommodate possible future public transit service, transit stops and bus shelters may be provided within the on-site portions of Marble Valley Parkway and Marble Lake Boulevard near the intersection of Lime Rock Valley Road. Based on ridership data presented in the *El Dorado Hills Community Transit Needs Assessment and US 50 Corridor Transit Operations Plan, Final Report*, 41,760 annual commute trips are made by El Dorado Hills residents using El Dorado Transit Commuter Service. Residents of El Dorado Hills account for about 72 percent of boardings at the El Dorado Hills Park-n-Ride lot, which includes riders that park in the lot and riders that use other means to access the service (i.e., walk, bike, and drop-off).



Based on this information, about one annual commute trip is generated per El Dorado Hills resident, assuming a population of 42,100 (2010 Census) in El Dorado Hills. Therefore, the project's 3,236 dwelling units could result in demand of about 8,400 annual commute trips (assuming a household population of 2.6 persons), or about 32 commute trips per weekday.



6.0 CUMULATIVE CONDITIONS

6.1 TRAVEL DEMAND FORECASTS

For this project, the El Dorado County model was utilized to develop forecasts in the study area. However, as is standard practice with large area travel demand models, a thorough model review was completed and the model was refined to ensure that it produced reasonable results in the study area.

The following refinements were implemented in the study area:

- Added roadway network detail
- Updated land use to reflect 2012 conditions
- Refined the traffic analysis zones (TAZs) in order to get more refined loading of trips in the study area
- Updated network attributes in the study area to reflect existing conditions (e.g. verified roadway network speeds, number of lanes on the roadway, and roadway capacities to reflect existing conditions)
- Updated the future year roadway network in the study area to reflect the County's Capital Improvement Program (CIP)
- Updated the future land use information to reflect approved and reasonably foreseeable projects in the study area
- Added peak hour assignment functionality

Specific information related to the model's performance is described below:

6.1.1 BASE YEAR MODEL VALIDATION

Before any model can be applied for use in a major specific plan application, it must first satisfy specific validation criteria identified by Caltrans, the Federal Highways Administration (FHWA), and the California Transportation Commission (CTC). These criteria were developed to ensure that a model is developed such that it can accurately forecast existing conditions based on land use and roadway network information, which improves the model's ability to accurately forecast future conditions. The state-of-the-practice for developing defensible forecasts for changes in the roadway network and / or changes in proposed land use is to use a valid base year model.



The first step of any model validation is to ensure that the model generally produces similar results to existing counts. Please note that, since the model is being used to generate AM peak hour and PM peak hour forecasts, the model must be valid at our study facilities for both time periods.

Key metrics for model validation guidelines are described below:

- The volume-to-count ratio is computed by dividing the volume assigned by the model and the actual traffic count for individual roadways (or intersections). The volume-to-count ratio should be less than 10%.
- The deviation is the difference between the model volume and the actual count divided by the actual count. Caltrans provides guidance on the maximum allowable deviation by facility type (e.g. lower-volume roadways can have a higher deviation than higher-volume roadways). 75% of the study facilities should be within the maximum allowable deviation.
- The correlation coefficient estimates the correlation between the actual traffic counts and the estimated traffic volumes from the model. The correlation coefficient should be greater than 0.88.
- The percent Root Mean Square Error (RMSE) is the square root of the model volume minus the actual count squared divided by the number of counts. It is a measure similar to standard deviation in that it assesses the accuracy of the entire model. The RMSE should be less than 40%.

The model validation statistics are summarized in Table 11. As shown in Table 11, the model meets or exceeds the identified model validation statistics in the study area. As such, the model is deemed appropriate for use in this assessment.



TABLE 11: TRAVEL DEMAND FORECASTING MODEL SUB AREA VALIDATION

Metric	Model Validation	Maximum Allowable Deviation
<i>AM Peak Hour – 114 Count Locations</i>		
Model / Count Ratio	1.04	between 0.90 and 1.10
Percent Within Caltrans Maximum Deviation	85%	> 75%
Percent Root Mean Square Error	24%	< 40%
Correlation Coefficient	0.98	> 0.88
<i>PM Peak Hour – 114 Count Locations</i>		
Model / Count Ratio	1.06	between 0.90 and 1.10
Percent Within Caltrans Maximum Deviation	86%	> 75%
Percent Root Mean Square Error	21%	< 40%
Correlation Coefficient	0.98	> 0.88

Source: Fehr & Peers, 2018



6.1.2 FUTURE (YEAR 2035) MODELING ASSUMPTIONS

All modifications incorporated into the validated Base Year model were incorporated into the future year (2035) travel demand forecasting model. Additionally, as previously mentioned, the model was also updated to include only roadway improvements consistent with the SACOG's MTP and the County's CIP.

Table 12 below describes capacity-enhancing improvements to roadway facilities in the project study area that are planned to occur prior to year 2035 and are included in the cumulative analysis. This information is primarily based on El Dorado County's CIP (Section 8.1 – west Slope Road / Bridge Individual Project Summaries) and SACOG's MTP / SCS (Appendix A1: MTP / SCS Project List). The validated El Dorado County model was used to develop AM and PM peak hour forecasts for the following scenarios:

- Cumulative No Project – Corresponds to a 2035 No Project Cumulative horizon that accounts for planned roadway improvements, land use growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects in the study area, including the following:
 - Bass Lake Hills Specific Plan
 - Cameron Estates
 - Carson Creek Specific Plan
 - Dixon Ranch
 - Lime Rock Valley Specific Plan
 - Promontory
 - Rancho Dorado
 - Ridgeview
 - San Stino Residential Project
 - Serrano
 - Tilden Park
 - Valley View Specific Plan
 - Central El Dorado Hills Specific Plan

Please note that this scenario assumes the allowable development levels based on the 398-lot Marble Valley Master Plan, which was previously approved in 1998.

- Cumulative Plus Proposed Project – Includes similar assumptions to the Cumulative No Project scenario, but incorporates buildout of the Proposed Project and associated roadway network.



For each scenario listed above, roadway segment and intersection turning movement volumes were pulled directly from the scenario-specific models and adjusted. Consistent with state-of-the-practice travel demand forecasting application, model error was corrected using the methodologies identified in the National Cooperative Highway Research Program Report 255 (Transportation Research Board, 1982) using the “difference method,” which adds the forecasted growth in traffic volume to existing roadway segment and intersection counts.

Figures 7 and 8 present AM and PM peak hour traffic volume forecasts for cumulative conditions without and with the proposed project, respectively.

TABLE 12: CAPACITY-ENHANCING ROADWAY IMPROVEMENTS (ASSUMED COMPLETION BY 2035)

Project Name	Project Description	Estimated Completion
Country Club Drive – El Dorado Hills Boulevard to Silva Valley Parkway	Construct new 2-lane road of Country Club Drive from El Dorado Hills Blvd. to Silva Valley Pkwy. Work includes curb, gutter, and sidewalk on both sides of the roadway. CIP#72377	By 2035
Country Club Drive – Silva Valley Parkway to Tong Road	Construct new 2-lane road of Country Club Drive from Silva Valley Parkway to Tong Road. Work includes curb, gutter, and sidewalk on both sides of the roadway. CIP#71362	By 2027
Country Club Drive Extension – Tong Road to Bass Lake Road	Construct 2-lane extension of Country Club Drive from Tong Road to Bass Lake Road, with 8-foot paved shoulder, curb and gutter, and new intersection at Bass Lake Road. CIP#71361	By 2035
Country Club Drive Realignment - Bass Lake Road to Tierra De Dios Drive	Realign Country Club Drive from Bass Lake Road / Old Bass Lake Road to Tierra de Dios Drive. Work includes constructing a two-lane road with 8-foot paved shoulders, sidewalk, curb and gutter. CIP#71360	By 2019
Green Valley Rd Widening - Francisco to Salmon Falls	Widen Green Valley Rd from Francisco Dr to Salmon Falls Rd to 4-lanes divided with curb, gutter, and sidewalk. CIP#GP178	By 2035
Green Valley Road Widening - County Line to Sophia Parkway	Widen Green Valley Rd from County line to Sophia Parkway from two to four lanes.	By 2018
Latrobe Connection	The project consists of intersection improvements at Golden Foothill Pkwy (south) and Carson Crossing Dr. CIP#66116	By 2027



TABLE 12: CAPACITY-ENHANCING ROADWAY IMPROVEMENTS (ASSUMED COMPLETION BY 2035)

Project Name	Project Description	Estimated Completion
Saratoga Way Ext - Phase 1	Construct new 2-lane arterial to extend Saratoga Wy from current terminus near Finders Wy to Sacramento County Line; includes median, 6-ft shoulders, right-turn pocket onto Finders Way, asphalt path, drainage system, environmental clearance and secure ROW for future 4-lane road from County Line to El Dorado Hills Blvd. CIP#71324 (Phase 2 CIP#GP147 - See ELD19234 in MTP.)	By 2019
Saratoga Way. (Phase 2)	Widen: 4 lanes from the Sacramento / El Dorado County line to El Dorado Hills Blvd. Includes: full curb, gutter, and sidewalk. (See ELD16010 for Phase 1) CIP#GP147	By 2035
Silva Valley Parkway / Serrano Parkway Traffic Circulation Improvement	Project includes traffic signal modification and lane re-striping at the Silva Valley Parkway / Serrano Parkway intersection, installation of an all-way stop at Serrano Parkway / Village Green intersection, and installation of left-turn prohibition signs at Silva Valley Parkway / Entrada intersection and Oak Meadow School driveway at Silva Valley Parkway. This project will be coordinated with the US 50 / Silva Valley Parkway Freeway Interchange (CIP#71328). CIP#72141	Completed
Silver Springs Parkway to Bass Lake Road (South Segment)	Realign Bass Lake Road south of Green Valley Road through the proposed Silver Springs subdivision, which is west of the existing Bass Lake Road. The new road is named Silver Springs Parkway. That development is responsible for building Silver Springs Parkway through their development. Silver Springs Parkway will be a two-lane standard divided roadway with shoulders. CIP#76108	By 2020
US 50 Aux Lane WB - El Dorado Hills Boulevard to Sacramento County Line	Widen US 50 and add auxiliary lane to westbound US 50 connecting the El Dorado Hills Blvd / Latrobe Rd Interchange to the future Empire Ranch Rd Interchange located in the City of Folsom; (City of Folsom will construct the EB aux lane.) CIP#53115	By 2035
US 50 50 Auxiliary Lane Westbound - Ponderosa Road to Cameron Park Drive	Widen US 50 and add an auxiliary lane to westbound US 50, connecting Cameron Park Drive Interchange to Ponderosa Road Interchange. CIP#53128	By 2035
US 50 Auxiliary Lane Westbound – Bass Lake Road to Silva Valley Parkway	Widen US 50 to add an auxiliary lane to westbound US 50 connecting the Bass Lake Road Interchange and Silva Valley Parkway Interchange. Timing of construction to be concurrent with or after the Bass Lake Road Interchange improvement (71330). CIP#53117	By 2027



TABLE 12: CAPACITY-ENHANCING ROADWAY IMPROVEMENTS (ASSUMED COMPLETION BY 2035)

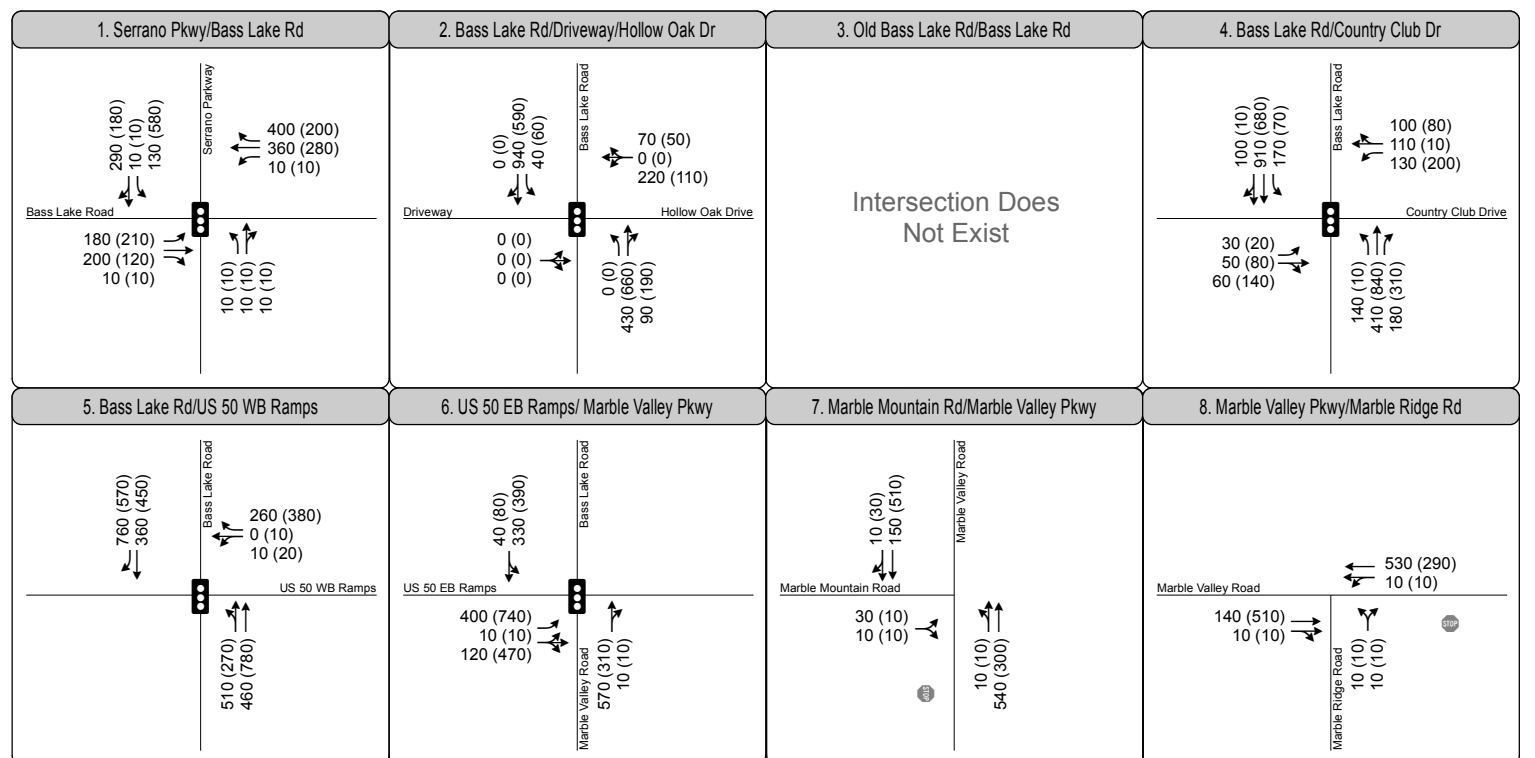
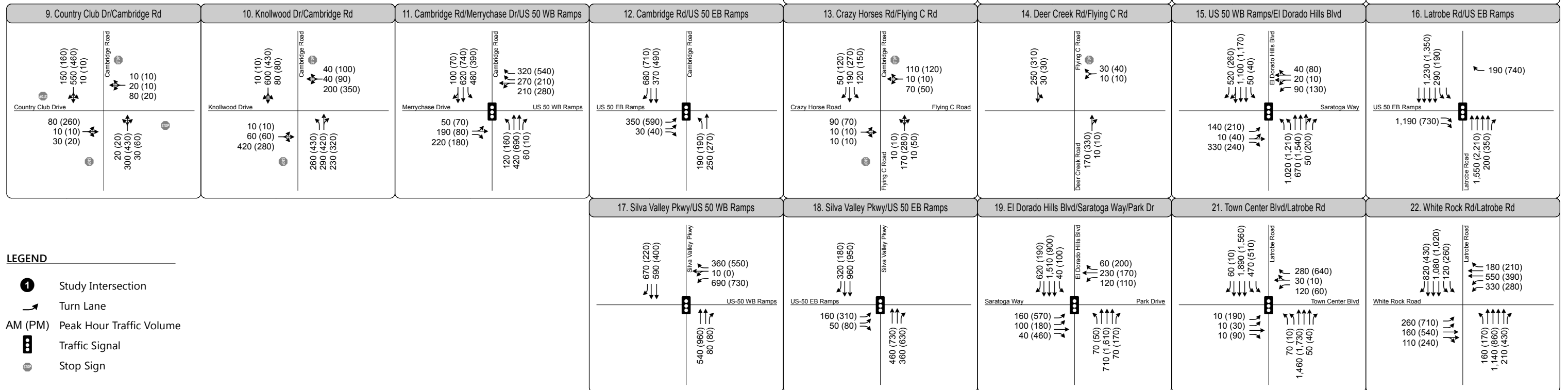
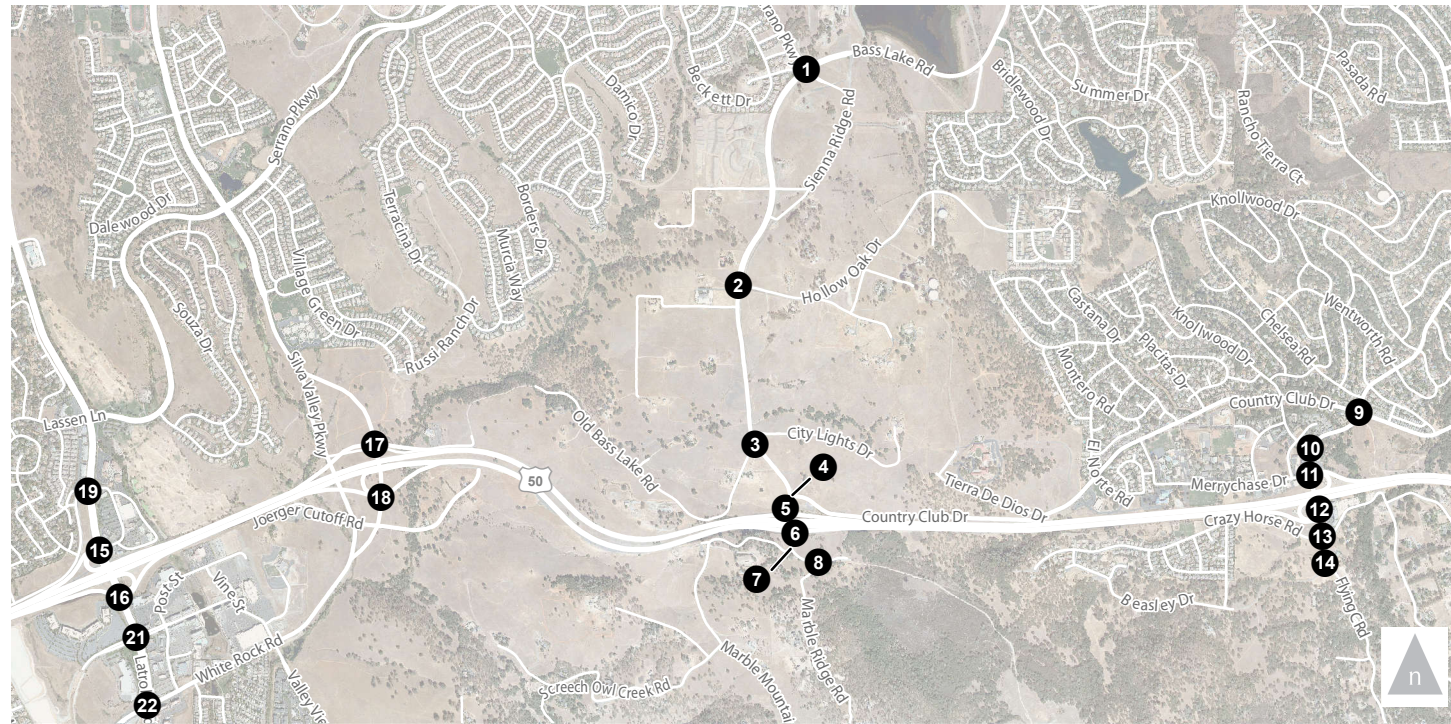
Project Name	Project Description	Estimated Completion
US 50 Auxiliary Lane Westbound – Cambridge Road to Bass Lake Road	Widen US 50 to add an auxiliary lane to westbound US 50 connecting the Cambridge Road Interchange to Bass Lake Road Interchange. Timing of construction to be concurrent with or after the Bass Lake Road Interchange improvement (71330). GP149	By 2035
US 50 Auxiliary Lane Eastbound – Bass Lake Road to Cambridge Road	Widen US 50 and add eastbound auxiliary lane between Bass Lake Road Interchange and Cambridge Road Interchange. Timing of construction to be concurrent with or after the Bass Lake Road Interchange improvements.	By 2035
US 50 Auxiliary Lane Eastbound – Cambridge Road to Cameron Park Drive	Widen US 50 and add eastbound auxiliary lane between Cambridge Road Interchange and Cameron Park Drive Interchange. Timing of construction to be concurrent with or after the Cambridge Road Interchange improvements.	By 2035
US 50 Auxiliary Lane Eastbound – Sacramento County Line to El Dorado Hills Boulevard / Latrobe Road Interchange	Widen US 50 and add eastbound auxiliary lane between planned US 50 / Empire Ranch Road Interchange and US 50 El Dorado Hills Boulevard / Latrobe Road Interchange. Timing of construction to be concurrent with El Dorado Hills Boulevard Interchange or Empire Ranch Interchange.	By 2035
US 50 / Bass Lake Rd Interchange Improvements	Phase 1 of a larger project for the complete reconstruction of the Bass Lake Road interchange. Phase 1 of the project includes a detailed study to determine the complete improvements needed. Phase 1 is assumed to include ramp widenings, road widening, signals, and bridge replacement. CIP#71330	By 2035
US 50 / Cambridge Rd. Interchange Improvements	Phase 1 improvements to Cambridge Road interchange consists of widening the existing EB and WB off-ramps; addition of new WB on-ramp from SB Cambridge Road; reconstruction of the local intersections to provide for additional capacity, both turning and through lanes; and the installation of traffic signals at the EB ramp-terminal intersection. Also preliminary engineering for Phase 2 improvements to the Cambridge Interchange. CIP#71332	By 2035
US 50 / Cameron Park Dr. Interchange Improvements	Interchange Improvements: this project includes detailed study to identify capacity improvement alternatives and selection of preferred alternative; assumes reconstruction of US 50 bridges to widen Cameron Park Dr. to 8 lanes under the overcrossing; road and ramp widening. CIP#72361	By 2035



TABLE 12: CAPACITY-ENHANCING ROADWAY IMPROVEMENTS (ASSUMED COMPLETION BY 2035)

Project Name	Project Description	Estimated Completion
US 50 / El Dorado Hills Blvd Interchange Improvements – (Phase 2B)	Reconstruct eastbound diagonal on-ramp and eastbound loop off-ramp for the ultimate configuration; add a lane to northbound El Dorado Hills Blvd under the overpass (eliminates merge lane and improves traffic flow from the eastbound loop off-ramp); eastbound diagonal on-ramp will be metered and have an HOV bypass. Project split from ELD15630 (CIP#71323).	By 2035
US 50 / Silva Valley Pkwy Interchange - Phase 1	New Interchange: Phase 1 includes US 50 on- / off-ramps, overcrossing, and US 50 aux lanes. (See ELD19291 / CIP#71345 for Phase 2). CIP#71328	Completed
US 50 / Silva Valley Pkwy Interchange - Phase 2 – On-Ramps and Auxiliary Lanes on US 50 (Connector Segment)	Final phase of new interchange: construction of eastbound diagonal and westbound loop on-ramps to US 50. (See ELD15610 / CIP#71328 for Phases 1). CIP#71345	By 2035
White Rock Rd Widening - Manchester to Sacramento County Line (Connector Segment)	Widen White Rock Rd from 2 to 4 lanes, divided, from Manchester Dr west to Sacramento County Line. CIP#GP137	By 2027
White Rock Rd Widening – Monte Verde to US 50 / Silva Valley Parkway Interchange (Connector Segment)	Widen White Rock Rd from 2-lanes undivided to 4 lanes divided, from Monte Verde Dr east to new future US 50 / Silva Valley Pkwy Interchange (ELD15610 / CIP71328); includes curb, gutter, sidewalk, and Class II bike lanes. CIP#72374	By 2035

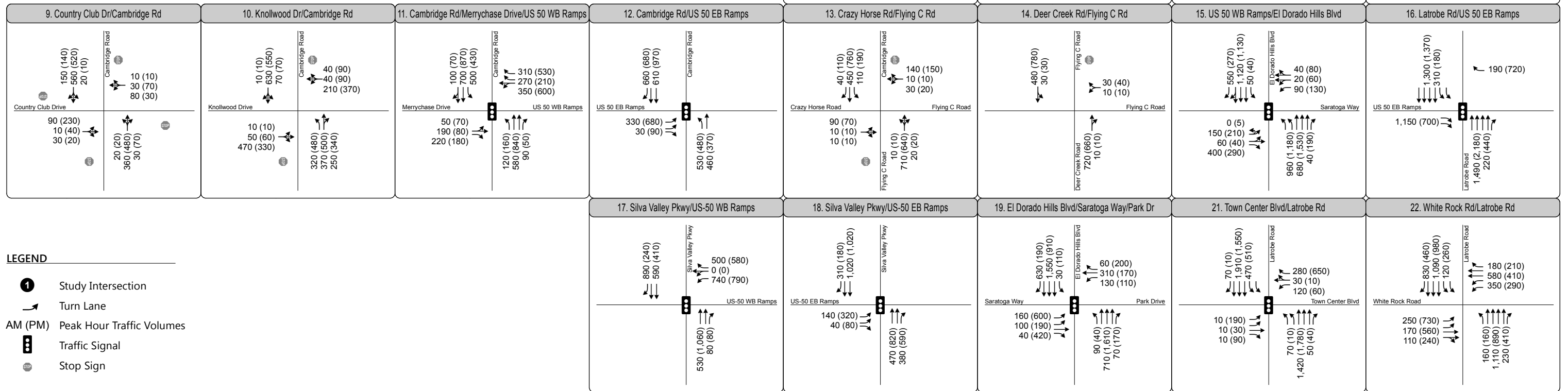
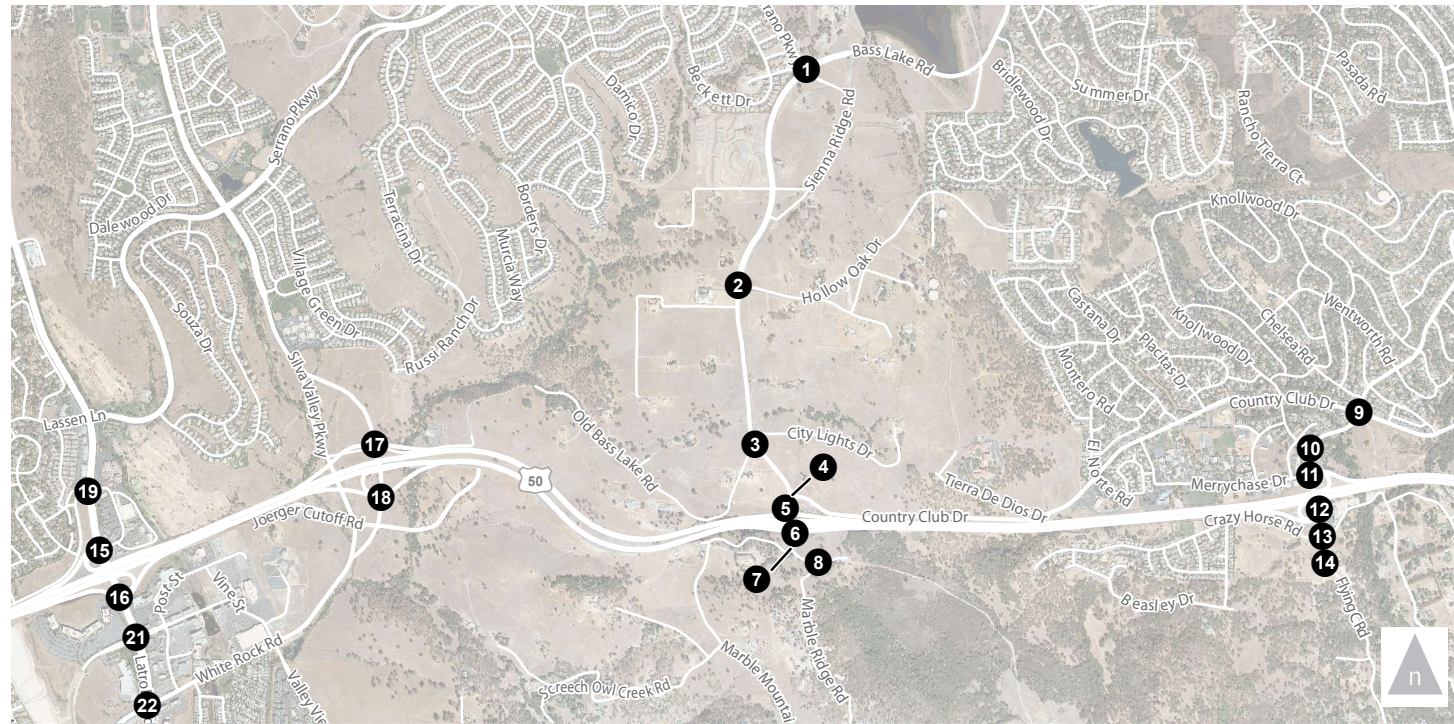




LEGEND

- Study Intersection
- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign

Figure 9.
Peak Hour Traffic Volumes and Lane Configurations -
Cumulative No Project Conditions



LEGEND

- 1 Study Intersection
- ↔ Turn Lane
- AM (PM) Peak Hour Traffic Volumes
- 🚦 Traffic Signal
- Stop Sign

Figure 10.
Peak Hour Traffic Volumes and Lane Configurations -
Cumulative Plus Project Conditions



6.2 PEAK HOUR VEHICLE LEVEL OF SERVICE

6.2.1 INTERSECTIONS

Analysis results, which are presented in Table 13, indicate that many of the study intersections, which are stop controlled, will operate unacceptably with increased traffic from build-out of the proposed project added to cumulative background traffic. Traffic generated by the project result in potential impacts at the following locations:

- Bass Lake Road / US 50 eastbound ramps (Intersection 6) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection will operate unacceptably at LOS F without the project during the AM peak hour. According to established significance criteria, the project is projected to “significantly worsen” conditions in the AM peak, since it would add more than 10 trips to the intersection during the AM peak hour, and would result in unacceptable (LOS F) conditions during the PM peak hour.
- Marble Valley Parkway / Marble Mountain Road (Intersection 7) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection will operate acceptably at LOS B without the project during the AM and PM peak hours. The project results in unacceptable, LOS E and LOS F conditions during the AM and PM peak hours, respectively.
- Marble Valley Parkway / Marble Ridge Road (Intersection 8) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection will operate acceptably at LOS B during the AM and PM peak hours. The project would result in unacceptable (LOS F) conditions during the PM peak hour.
- Cambridge Road / Country Club Drive (Intersection 9) – This intersection will operate at LOS F without the project during the AM and PM peak hours. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM and PM peak hours.
- Cambridge Road / Knollwood Drive (Intersection 10) – This intersection will operate at LOS F without the project during the AM and PM peak hours. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM and PM peak hours.



- Cambridge Road / US 50 westbound ramps (Intersection 11) – This intersection will operate at LOS F during the AM peak hour without the project. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM peak hour. The project will also result in LOS F during the PM peak hour.
- Cambridge Road / Flying C Road / Crazy Horse Road (Intersection 13) – This intersection will operate at LOS F without the project during the PM peak hours. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the PM peak hour. The project will also result in LOS F during the AM peak hour.



TABLE 13: INTERSECTION LOS AND DELAY – CUMULATIVE CONDITIONS

Intersection	Control	Cumulative Conditions (LOS / Delay)		Cumulative Plus Project Conditions (LOS / Delay)	
		AM	PM	AM	PM
1. Bass Lake Road / Serrano Parkway	Signal	B / 18	C / 31	B / 18	D / 37
2. Bass Lake Road / Hollow Oak Drive	Signal	B / 17	B / 15	B / 17	A / 10
3. Bass Lake Road / Old Bass Lake Road	SSSC	Does Not Exist			
4. Bass Lake Road / Country Club Drive	Signal	C / 21	C / 30	C / 34	D / 51
5. Bass Lake Road / US WB 50 Ramps	Signal	A / 1	A / 3	B / 10	A / 5
6. Bass Lake Road / US EB 50 Ramps	Signal	F / 92	C / 22	<u>F / >180</u>	<u>F / >180</u>
7. Marble Valley Road / Marble Mountain Road	SSSC	B / 12	B / 13	<u>E / 43</u>	<u>F / 55</u>
8. Marble Valley Road / Marble Ridge Road	SSSC	B / 11	B / 13	D / 27	<u>F / 54</u>
9. Cambridge Road / Country Club Drive	AWSC	F / 154	F / 99	<u>F / >180</u>	<u>F / 163</u>
10. Cambridge Road / Knollwood Drive ¹	SSSC	F / -	F / -	<u>F / -</u>	<u>F / -</u>
11. Cambridge Road / Merrychase Drive / US 50 WB Ramps	Signal	F / 113	E / 60	<u>F / 170</u>	<u>F / 127</u>
12. Cambridge Road / US 50 EB Ramps	Signal	B / 11	B / 15	C / 22	D / 44
13. Cambridge Road / Flying C Road / Crazy Horse Road	SSSC	E / 39	F / 72	<u>F / >180</u>	<u>F / >180</u>
14. Flying C Road / Deer Creek Road	SSSC	B / 10	B / 12	C / 20	C / 21
15. El Dorado Hills Boulevard / US 50 WB Ramps	Signal	C / 25	D / 39	D / 47	D / 49
16. Latrobe Road / US 50 EB Ramps	Signal	B / 18	B / 14	D / 54	B / 18
17. Silva Valley Parkway / US 50 WB Ramps	Signal	A / 9	B / 19	A / 10	C / 20
18. Silva Valley Parkway / US 50 EB Ramps	Signal	A / 3	B / 11	A / 3	B / 11
19. El Dorado Hills Blvd / Park Drive / Saratoga Way	Signal	C / 30	D / 43	D / 37	D / 50
21. Latrobe Road / Town Center Drive	Signal	C / 35	E / 72	D / 42	E / 76
22. Latrobe Road / White Rock Road	Signal	E / 64	D / 49	E / 67	E / 80

Note: SSSC = side-street stop-control, AWSC = all-way stop control

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

The average delay is measured in seconds per vehicle. For signalized and AWSC intersections, the delay shown is the average control delay for the overall intersection. For SSSC intersections, the LOS and control delay for the worst movement is shown.



Intersection LOS and delay is calculated based on the procedures and methodology contained in the *HCM* (TRB, 2010). Intersections 1-14, 17, and 18 are analyzed in Synchro 9. Intersections 15-16, and 19-22 are analyzed in SimTraffic.

¹Analyzed with HCM 2000 Methodology

Source: Fehr & Peers, 2018



6.2.2 ROADWAY SEGMENTS

Analysis results, which are presented in Table 14, indicate that all study roadway segments except the following three will operate acceptably under cumulative conditions, due primarily to the capacity increasing roadway project included in the County's CIP, which are documented in Table 12:

- Bass Lake Road – Hollow Oak Drive to Country Club Drive (LOS F in the AM peak hour)
- Cameron Park Drive – Alhambra Drive to Oxford Road (LOS F in the PM peak hour)
- Cameron Park Drive – Oxford Road to Hacienda Drive (LOS F in the PM peak hour)

According to established significance criteria, the project is projected to "significantly worsen" conditions during the AM peak hour on Bass Lake Road between Hollow Oak Drive and Country Club Drive, since it would add more than 10 trips to the roadway segment. The project is not projected to significantly worsen conditions during the PM peak hour on the Cameron Park Drive, since it would not add more than 10 trips to the roadway segments operating unacceptably.



TABLE 14: ROADWAY SEGMENT PEAK HOUR LEVEL OF SERVICE – CUMULATIVE CONDITIONS

Roadway	Segment	Facility Type	Cumulative Volume / Volume – Capacity (V / C) Ratio / LOS		Cumulative + Project Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Bass Lake Rd	Green Valley Rd to Bridlewood Dr	2 lane arterial	770 / 0.47 / C ¹	820 / 0.50 / C ¹	750 / 0.45 / C ¹	820 / 0.50 / C ¹
	Bridlewood Dr to Serrano Pkwy	2 lane arterial	1,070 / 0.65 / D	1,150 / 0.70 / D	1,070 / 0.65 / D	1,180 / 0.72 / D
	Serrano Pkwy to Hollow Oak Dr	2 lane arterial	1,010 / 0.61 / D	880 / 0.53 / D	1,030 / 0.62 / D	880 / 0.53 / D
	Hollow Oak Dr to Country Club Dr	2 lane arterial	1,680 / 1.02 / F	1,540 / 0.65 / D	1,720 / 1.04 / F	1,540 / 0.93 / D
	Country Club Dr to US 50	4 lane divided arterial	1,820 / 0.55 / C ¹	2,150 / 0.65 / D	2,060 / 0.63 / D	2,100 / 0.64 / D
Cambridge Rd	Green Valley Rd to Oxford Rd	2 lane arterial	570 / 0.35 / C ¹	660 / 0.40 / C ¹	580 / 0.36 / C ¹	680 / 0.42 / C ¹
	Oxford Rd to Knollwood Dr ²	2 lane arterial	950 / 0.58 / D	1,080 / 0.72 / D	990 / 0.55 / D	1,210 / 0.65 / D
	Knollwood Dr to Country Club Dr ²	2 lane arterial	1,040 / 0.63 / D	1,260 / 0.76 / D	1,100 / 0.60 / D	1,310 / 0.71 / D
	Country Club Dr to US 50	4 lane divided arterial	1,960 / 0.60 / C ¹	2,170 / 0.66 / D	2,220 / 0.64 / D	2,500 / 0.75 / D
Cameron Park Dr	Green Valley Rd to Alhambra Dr	2 lane arterial	850 / 0.52 / C ¹	990 / 0.60 / D	830 / 0.50 / C ¹	970 / 0.59 / D
	Alhambra Dr to Oxford Rd	2 lane arterial	1,480 / 0.90 / D	1,750 / 1.06 / F	1,500 / 0.91 / D	<u>1,750 / 1.06 / F</u>
	Oxford Rd to Hacienda Dr	2 lane arterial	1,400 / 0.85 / D	1,860 / 1.13 / F	1,400 / 0.85 / D	1,860 / 1.13 / F
	Hacienda Dr to US 50	4 lane undivided arterial	1,660 / 0.53 / C ¹	2,300 / 0.73 / D	1,680 / 0.54 / D	2,310 / 0.74 / D
Country Club Dr	Bass Lake Rd to Merrychase Dr	2 lane arterial	730 / 0.44 / C ¹	720 / 0.44 / C ¹	680 / 0.41 / C ¹	630 / 0.38 / C ¹
	Merrychase Dr to Knollwood Dr	2 lane arterial	660 / 0.40 / C ¹	700 / 0.42 / C ¹	610 / 0.37 / C ¹	600 / 0.36 / C ¹
	Knollwood Dr to Cambridge Rd	2 lane arterial	480 / 0.29 / C ¹	670 / 0.41 / C ¹	490 / 0.30 / C ¹	600 / 0.36 / C ¹



TABLE 14: ROADWAY SEGMENT PEAK HOUR LEVEL OF SERVICE – CUMULATIVE CONDITIONS

Roadway	Segment	Facility Type	Cumulative Volume / Volume – Capacity (V / C) Ratio / LOS		Cumulative + Project Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
	Cambridge Rd to Royal Dr	2 lane arterial	290 / 0.18 / C ¹	310 / 0.19 / C ¹	290 / 0.18 / C ¹	310 / 0.19 / C ¹
	Royal Dr to Cameron Park Dr	2 lane arterial	230 / 0.14 / C ¹	370 / 0.22 / C ¹	230 / 0.14 / C ¹	370 / 0.22 / C ¹
Durock	US 50 to Business Dr ³	2 lane arterial	620 / 0.38 / C ¹	840 / 0.51 / C ¹	640 / 0.39 / C ¹	870 / 0.53 / D
	Business Dr to S. Shingle Rd	2 lane arterial	550 / 0.33 / C ¹	740 / 0.45 / C ¹	560 / 0.34 / C ¹	760 / 0.46 / C ¹

Notes: ¹LOS at this location is C or better.

²Cambridge Road between Country Club Drive and Oxford Road is allowed to operate at LOS F (maximum V / C / ratio of 1.07) until 2018 per County standard

³Durock Road / Cameron Park Drive between Coach Lane and Robin Lane is allowed to operate at LOS F (maximum V / C ratio of 1.11) until 2018 per County standard.

Volume-to-Capacity ratio and LOS is based on the HCM 2010 peak hour level of service thresholds.

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

Source: Fehr & Peers, 2018



6.2.3 FREEWAY FACILITIES

Analysis results, which are presented in Table 15, indicate that all of the study freeway facilities will operate acceptably under cumulative conditions without and with the project. The capacity increasing projects from the County's CIP, which are documented in Table 12, include many projects that will add capacity of US 50, increase east / west parallel capacity, and add new interchange connections to US 50. The following lists some of the more significant transportation improvements in the US 50 corridor:

Interchange Projects

- US 50 / El Dorado Hills Boulevard Interchange Improvements (final improvement phases)
- US 50 / Silva Valley Parkway Interchange (new connection to US 50)
- US 50 / Empire Ranch Road Interchange (new connection to US 50)
- US 50 / Bass Lake Road Interchange Upgrade
- US 50 / Cambridge Road Interchange Upgrade

Mainline Projects

- Westbound US 50 interchange-to-interchange auxiliary lane (Bass Lake Road to Silva Valley Parkway)
- Westbound and eastbound US 50 auxiliary lane (Silva Valley Parkway to Empire Ranch Road)
- Eastbound US 50 auxiliary lane (Silva Valley Parkway to Empire Ranch Road)
- Westbound US 50 interchange-to-interchange auxiliary lane (Silva Valley Parkway to El Dorado Hills Boulevard)
- Eastbound US 50 interchange-to-interchange auxiliary lane (El Dorado Hills Boulevard to Silva Valley Parkway)
- Westbound US 50 interchange-to-interchange auxiliary lane (Cambridge Drive to Bass Lake Road)
- Eastbound US 50 interchange-to-interchange auxiliary lane (Bass Lake Road to Cambridge Drive)

Arterial Roadway Projects

- Saratoga Way Extension from El Dorado Hills Boulevard to Iron Point Road
- Country Club Drive Extension from Bass Lake Road to El Dorado Hills Boulevard
- Extension of Empire Ranch Road from US 50 to White Rock Road
- Latrobe Road Connector (new roadway between Latrobe Road and White Rock Road)

Figure 11 compares existing conditions on US 50 to US 50 with the interchange and mainline projects listed above. Figure 12 shows peak hour US 50 mainline and ramp volumes under cumulative conditions. About 11 percent of project trips will have an origin / destination in Rancho Cordova and other areas to the west, including unincorporated Sacramento County and the City of Sacramento.



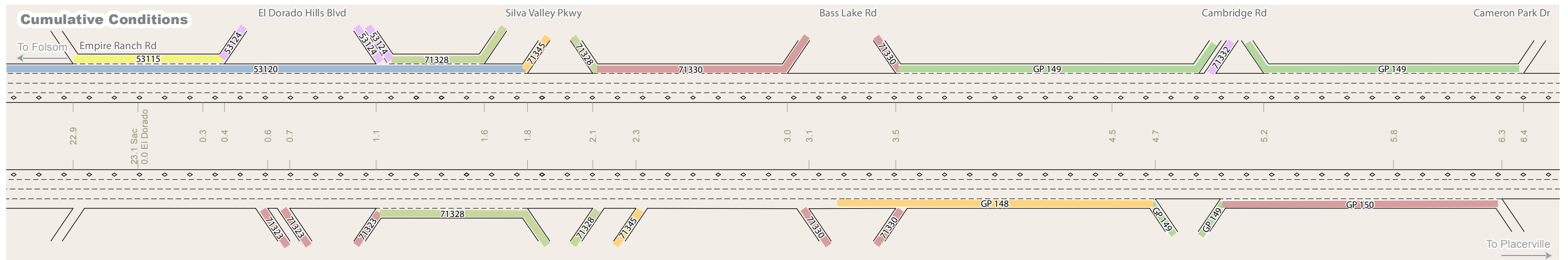
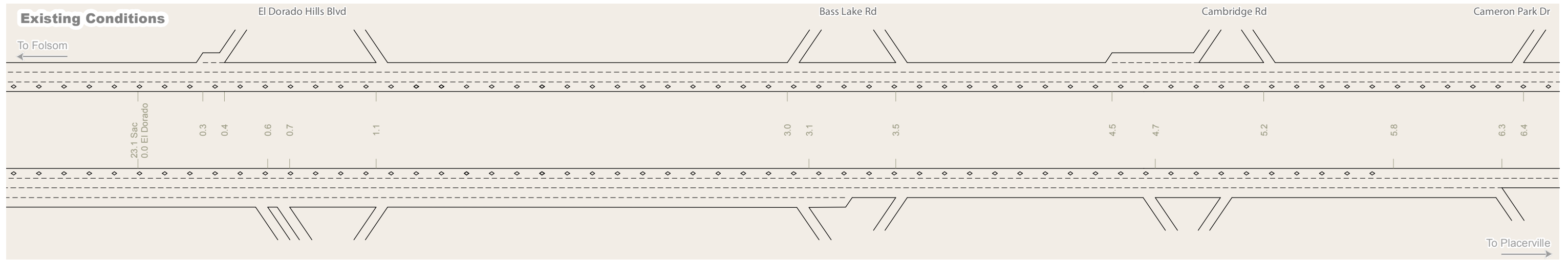


Figure 11.

Programmed Freeway Improvements

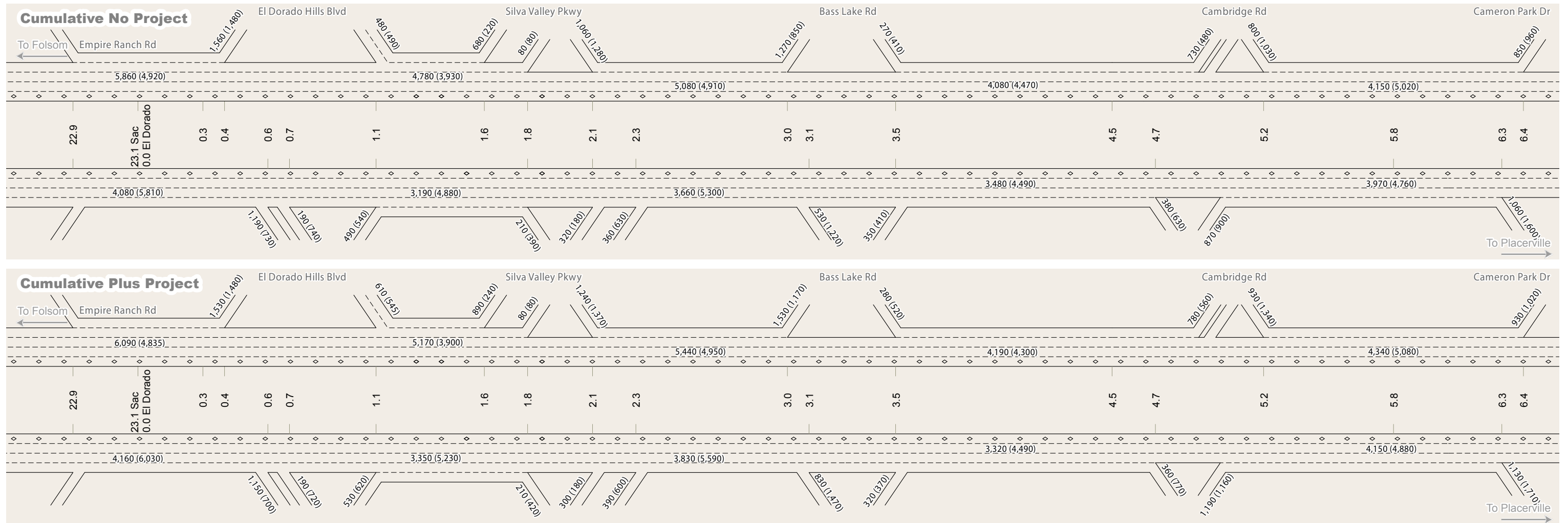


Figure 12.
**Freeway Mainline and Ramp Peak Hour Traffic Volumes -
 Cumulative Conditions**

TABLE 15: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS

Freeway	Segment	Facility Type	Cumulative No Project Density ¹ / LOS		Cumulative Plus Project Density ¹ / LOS	
			AM	PM	AM	PM
US 50 EB	Latrobe Rd off-ramp	Diverge	28 / D	33 / D	28 / D	34 / D
	El Dorado Hills Blvd off-ramp	Diverge	20 / C	29 / D	21 / C	30 / D
	Latrobe Rd on-ramp to Silva Valley Pkwy off-ramp	Weave (HCM)	19 / B	27 / C	20 / B	29 / D
		Basic ²	12 / B	17 / B	13 / B	19 / B
	Silva Valley Pkwy (loop) on-ramp	Merge	18 / B	22 / C	18 / B	24 / C
	Silva Valley Pkwy (slip) on-ramp	Merge	22 / C	29 / D	23 / C	30 / D
	Silva Valley Pkwy on-ramp to Bass Lake Rd off-ramp	Basic	20 / C	25 / C	21 / C	27 / D
	Bass Lake Rd off-ramp	Diverge	24 / C	31 / D	26 / C	33 / D
	Bass Lake Rd on-ramp to Cambridge Rd off-ramp	Basic ⁴	18 / B	21 / C	17 / B	21 / C
	Cambridge Rd on-ramp to Cameron Park Drive off-ramp	Basic ⁴	20 / C	22 / C	21 / C	23 / C
US 50 WB	Cameron Park Drive on-ramp to Cambridge Rd off-ramp	Weave (HCM)	44 / E	- ²	48 / E	- ²
		Basic ⁴	20 / C	24 / C	21 / C	24 / C
	Cambridge Rd on-ramp to Bass Lake Rd off-ramp	Basic ⁴	19 / C	20 / C	20 / C	20 / C
	Bass Lake Rd on-ramp to Silva Valley Pkwy off-ramp	Basic ²	25 / C	23 / C	27 / D	24 / C
	Silva Valley Pkwy (loop) on-ramp	Diverge	14 / B	13 / B	15 / B	13 / B



TABLE 15: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS

Freeway	Segment	Facility Type	Cumulative No Project Density ¹ / LOS		Cumulative Plus Project Density ¹ / LOS	
			AM	PM	AM	PM
	Silva Valley Pkwy (slip) on-ramp to El Dorado Hills Blvd off-ramp	Weave (HCM)	29 / D	22 / C	33 / D	22 / C
		Weave (Leisch)	- ¹	- ¹	- / C	- ¹
		Basic	17 / B	14 / B	-	14 / B
	El Dorado Hills Blvd on-ramp to Empire Ranch off-ramp	Weave (HCM)	40 / E	33 / D	41 / E	33 / D
		Weave (Leisch)	- / D	- / C	- / D	- / C

Notes: ¹Density reported as passenger cars per mile per lane. Density is not reported for LOS F operations. Analysis based on HCM 2010.

²Out of realm of weaving for Leisch analysis; analyzed as a basic segment

³ Out of realm of weaving for HCM analysis; analyzed as a basic segment

⁴Out of realm of weaving for Leisch analysis and HCM analysis; analyzed as a basic segment

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

Source: Fehr & Peers, 2018



6.3 PEDESTRIAN AND BICYCLE CIRCULATION

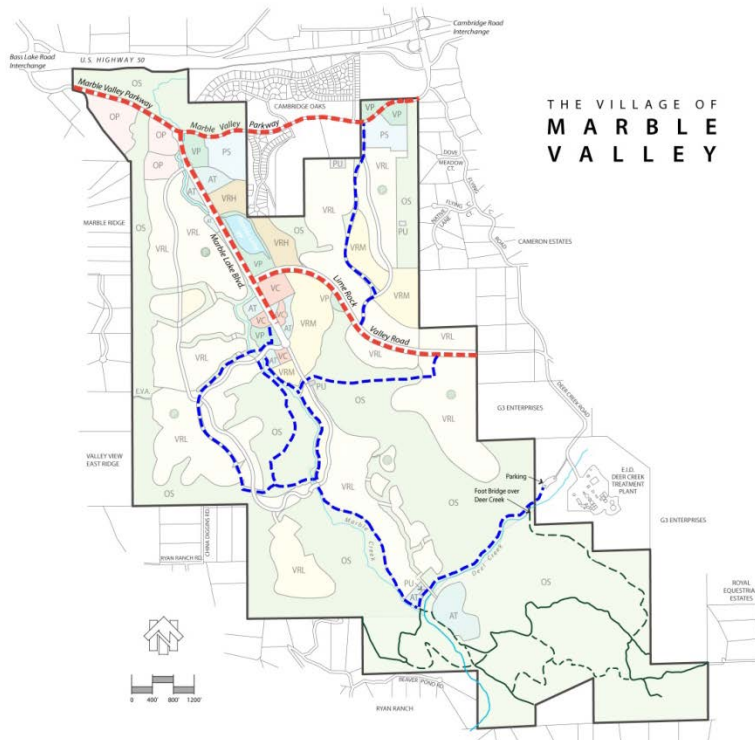
Bicycle network improvements are planned within the study area. Figure 5 identifies planned bikeways presented in the *El Dorado Bicycle Transportation Plan, 2010 Update* and the *Sacramento Area Council of Governments (SACOG) Metropolitan Transportation Plan / Sustainable Communities Strategy (MTP / SCS) for 2035*. The following are planned improvement projects:

- El Dorado Hills Class I bike path - SMUD Corridor: Design and construct a Class I bike path between El Dorado Hills Boulevard and Silva Valley Parkway within the powerline easement operated by the Sacramento Municipal Utility District (SMUD). A portion of this project has been constructed between Silva Valley and New York Creek,
- Latrobe Road Class II bike lanes from Investment Boulevard to Deer Creek / SPTC
- Old Bass Lake Road – El Dorado Hills Boulevard to Bass Lake Road Connection, Phase 1: Use existing roadway as Class I path from Tong Road to Old Bass Lake Road
- Saratoga Way Extension Class II bike lanes included in extension of Saratoga Way from Finders Way to County Line. (Alternatively construct a Class I bike path prior to construction of extension of Saratoga Way to Iron Point Road) An informal trail exists connecting these roadways,
- Bass Lake Road Class II bike lanes from Green Valley Road to US 50
- Bike path parallel to US 50 on the north side – El Dorado Hills Boulevard to Bass Lake Road Connection, Phase 2: Connect Silva Valley Road to El Dorado Hills Village Center Shopping Center. The Central El Dorado Hills Specific Plan, if approved, will implement a portion of this bike path.
- El Dorado Hills Boulevard bike lanes, Phase 1: Saratoga Way to Governor Drive / St. Andrews
- El Dorado Hills Boulevard bike path, Phase 2: Utilizing an existing golf cart undercrossing of Serrano Parkway, extend the bike path from the current terminus at Serrano Parkway to Raley's Center. The Central El Dorado Hills Specific Plan, if approved, will implement this improvement.
- El Dorado Hills Boulevard to Bass Lake Connection, Phase 1; Class III bike route on Tong Road, Class III bike route on Old Bass Lake Road.
- Green Valley Road Class II bike lanes from Francisco Drive to Pleasant Grove Middle School
- Harvard Way bike path from Clermont Road to El Dorado Hills Boulevard
- Silva Valley Parkway bike lanes from the new connection with White Rock Road to Green Valley Road
- SPTC / El Dorado Trail Class I bike path from Latrobe Road to County Line



- Class I bike path and US 50 Undercrossing or overcrossing between the El Dorado Hills Town Center and El Dorado Hills Village Center (not fully funded or listed in MTP / SCS). As outlined below, the Central El Dorado Hills Specific Plan, if approved, could accommodate a relocation of the overcrossing of US 50 adjacent to the Village Park with, connecting the planned bike path north of US 50 to the El Dorado Hills Town Center.
- Class I bike path within the SMUD power line easement between El Dorado Hills Boulevard and Sophia Parkway (not fully funded or listed in the MTP / SCS)

The project proposes a Class I multi-use path on Marble Valley Parkway, Marble Lake Boulevard, and Lime Rock Valley Road. In addition, the project proposes a network of gravel trails and unpaved hiking / equestrian trails integrating with existing trails. The image to the right shows proposed bicycle facilities and trails.



TRAILS	
	Class I Multi-Use Paved Path
	Gravel Trail (AB Crushed Rock)
	Unpaved Hiking/Equestrian Trail (Existing)
	Unpaved Hiking/Equestrian Trail (Proposed)



6.4 TRANSIT

As described above, the project will provide bicycle and pedestrian connections to existing and planned bicycle and pedestrian facilities and will provide a 100 to 120 space park-n-ride lot. To accommodate possible future public transit service, transit stops and bus shelters may be provided within the on-site portions of Marble Valley Parkway and Marble Lake Boulevard near the intersection of Lime Rock Valley Road. Based on ridership data presented in the *El Dorado Hills Community Transit Needs Assessment and US 50 Corridor Transit Operations Plan, Final Report*, 41,760 annual commute trips are made by El Dorado Hills residents using El Dorado Transit Commuter Service. Residents of El Dorado Hills account for about 72 percent of boardings at the El Dorado Hills Park-n-Ride lot, which includes riders that park in the lot and riders that use other means to access the service (i.e., walk, bike, and drop-off).

Based on this information, about one annual commute trip is generated per El Dorado Hills resident, assuming a population of 42,100 (2010 Census) in El Dorado Hills. Therefore, the project's 3,236 dwelling units could result in demand of about 8,400 annual commute trips (assuming a household population of 2.6 persons), or about 32 commute trips per weekday.



7.0 IMPACT STATEMENTS AND MITIGATION MEASURES

Project impacts were determined by comparing conditions with the project to conditions without the project in accordance with the established significance criteria presented in Section 4.2.

7.1 EXISTING PLUS PROJECT

Analysis results, which are presented in Table 16, indicate that the addition of the project would exacerbate unacceptable operations at three intersections and result in unacceptable operation at eight intersections. The following discusses these impacts and associated mitigation:

7.1.1 INTERSECTIONS

Impacts

- Impact 1 - Bass Lake Road / Country Club Drive (Intersection 4) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates unacceptably at LOS F without the project during the AM peak hour and acceptably at LOS C during the PM peak hour. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM peak hour operations. The project would also result in unacceptable (LOS F) conditions during the PM peak hour. **This is a significant impact.**

- Impact 2 - Bass Lake Road / US 50 westbound ramps (Intersection 5) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS B and LOS C during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours. Poor operation at this intersection will result in vehicle queuing on the westbound off ramp during the PM peak hour that could cause vehicles to spill back to the US 50 mainline, impacting mainline operations. **This is a significant impact.**

- Impact 3 - Bass Lake Road / US 50 eastbound ramps (Intersection 6) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS C during the AM peak hour and unacceptably at LOS F during the PM peak hour without the project. The project would result in unacceptable (LOS F) conditions during the AM peak hour, and according to established significance criteria, the project is projected to “significantly worsen” conditions, since it



would add more than 10 trips to the intersection during the PM peak hour. Poor operation at this intersection will result in vehicle queuing on the eastbound off ramp during the PM peak hour that could cause vehicles to spill back to the US 50 mainline, impacting mainline operations. **This is a significant impact.**

- Impact 4 - Marble Valley Parkway / Marble Mountain Road (Intersection 7) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS A without the project during the AM and PM peak hours. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours. **This is a significant impact.**
- Impact 5 - Marble Valley Parkway / Marble Ridge Road (Intersection 8) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection operates acceptably at LOS A without the project during the AM and PM peak hours. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours. **This is a significant impact.**
- Impact 6 - Cambridge Road / Country Club Drive (Intersection 9) – This intersection operates acceptably at LOS E and C during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the AM peak hour. **This is a significant impact.**
- Impact 7 - Cambridge Road / Knollwood Drive (Intersection 10) – This intersection operates unacceptably at LOS F during the AM peak hour and acceptably at LOS E during the PM peak hour without the project. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM and PM peak hour. The project would also result in unacceptable (LOS F) conditions during the PM peak hour. **This is a significant impact.**
- Impact 8 - Cambridge Road / US 50 eastbound ramps (Intersection 12) – This intersection operates acceptably at LOS B and E during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the AM and PM peak hours. **This is a significant impact.**
- Impact 9 - Cambridge Road / Flying C Road / Crazy Horse Road (Intersection 13) – This intersection operates acceptably at LOS B during the AM and PM peak hours without the project. The project results in unacceptable (LOS F) conditions during the AM peak hour. **This is a significant impact.**
- Impact 10 - Latrobe Road / Town Center Boulevard (Intersection 21) – This intersection operates acceptably at LOS B and D during the AM and PM peak hours, respectively, without the project. The project results in unacceptable (LOS F) conditions during the PM peak hour. **This is a significant impact.**



- Impact 11 - Latrobe Road / White Rock Road (Intersection 22) – This intersection operates acceptably at LOS C during the AM and PM peak hours, without the project. The project results in unacceptable (LOS F) conditions during the PM peak hour. **This is a significant impact.**

Mitigation

- Mitigation 1 - Bass Lake Road / Country Club Drive (Intersection 4) – This intersection will be part of the planned realignment of Country Club Drive (schedule to be completed in 2019), the extension of Country Club Drive to Tong Road (scheduled to be completed in 2027). Implementation of the following improvements would provide acceptable operation:

- Install traffic signal control.
- Provide one through lane and a separate right-turn lane on the northbound approach.
- Provide one left-turn lane, and two through lanes on the southbound approach.
- Provide one left-turn lane and one right-turn lane on the westbound approach.

Implementation of this improvement would result in acceptable LOS D or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

The project applicant should work collaboratively with El Dorado County to initiate programming studies to identify the scope of the ultimate interchange reconstruction, which will be used to guide phased implementation of at-grade improvements and interchange reconstruction to ensure consistency with General Plan Policy TC-Xf.

If constructed by others or added to the 10-year CIP prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this



improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 2 - Bass Lake Road / US 50 westbound ramps (Intersection 5) – This intersection will be part of the planned realignment of Country Club Drive (schedule to be completed in 2019). Implementation of the following improvements would provide acceptable operation:

- Construct a loop on-ramp to US 50 westbound from northbound Bass Lake Road.
- Install traffic signal control.
- Provide one through lane and a separate right-turn lane on the northbound and southbound approaches.
- Provide one shared left-turn / through lane on the westbound approach.

Implementation of this improvement would result in acceptable LOS D or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

The project applicant should work collaboratively with El Dorado County to initiate programming studies to identify the scope of the ultimate interchange reconstruction, which will be used to guide phased implementation of at-grade improvements and interchange reconstruction to ensure consistency with General Plan Policy TC-Xf.

If constructed by others or added to the 10-year CIP prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for



implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 3 - Bass Lake Road / US 50 eastbound ramps (Intersection 6) – This intersection will be part of the planned realignment of Country Club Drive (schedule to be completed in 2019). Implementation of the following improvements would provide acceptable operation:

- Install traffic signal control.
- Provide two through lanes and a separate right-turn lane on the northbound approach.
- Provide one left-turn lane and one through lane the southbound approach.
- Provide one shared left-turn / through lane and two right-turn lanes on the eastbound approach.

Implementation of this improvement would result in acceptable LOS D or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

The project applicant should work collaboratively with El Dorado County to initiate programming studies to identify the scope of the ultimate interchange reconstruction, which will be used to guide phased implementation of at-grade improvements and interchange reconstruction to ensure consistency with General Plan Policy TC-Xf.

If constructed by others or added to the 10-year CIP prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for



implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 4 - Marble Valley Parkway / Marble Mountain Road (Intersection 7) – Implementation of the following improvements would provide acceptable operation:

- Restrict access to right-in / right-out and left-turn in movements only.
- Provide an uncontrolled U-turn movement just east of Marble Ridge Road to accommodate the restricted turn movements.

Implementation of this improvement would result in acceptable LOS D or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

The project applicant should work collaboratively with El Dorado County to initiate programming studies to identify the scope of the ultimate interchange reconstruction, which will be used to guide phased implementation of at-grade improvements and interchange reconstruction to ensure consistency with General Plan Policy TC-Xf.

If constructed by others or added to the 10-year CIP prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.



Mitigation 5 - Marble Valley Parkway / Marble Ridge Road (Intersection 8) – Implementation of Mitigation 4 would result in acceptable LOS D or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**. These mitigations are as follows:

- Restrict access to right-in / right-out and left-turn in movements only.
- Provide an uncontrolled U-turn movement just east of Marble Ridge Road to accommodate the restricted turn movements.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

The project applicant should work collaboratively with El Dorado County to initiate programming studies to identify the scope of the ultimate interchange reconstruction, which will be used to guide phased implementation of at-grade improvements and interchange reconstruction to ensure consistency with General Plan Policy TC-Xf.

If constructed by others or added to the 10-year CIP prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 6 - Cambridge Road / Country Club Drive (Intersection 9) – Implementation of the following improvements to the Cambridge Road / Country Club Drive intersection would result in acceptable LOS B and C operation during the AM and PM peak hours, respectively:

- Provide one shared left-turn / through lane and one exclusive right-turn lane on the northbound and southbound approaches



Implementation of this improvement would result in acceptable LOS E or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 7 - Cambridge Road / Knollwood Drive (Intersection 10) – Implementation of the following improvements to the Cambridge Road / Knollwood Drive intersection would result in acceptable LOS C and B operation during the AM and PM peak hours, respectively:

- Install traffic signal control
- Provide coordinated traffic signal operation with westbound off-ramp terminal intersection
- Provide one left-turn lane and a shared through / right-turn lane on the northbound and southbound approaches
- Provide protected left-turn phasing on the northbound and southbound approaches

Implementation of this improvement would result in acceptable LOS E or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.



The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 8 - Cambridge Road / US 50 eastbound ramps (Intersection 12) –Implementation of the following improvements to the Cambridge Road / US 50 eastbound ramps intersection would result in acceptable LOS B and C operation during the AM and PM peak hours, respectively:

- Install traffic signal control
- Provide one left-turn lane and one through lane on the northbound approach

Implementation of this improvement would result in acceptable LOS E or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others



If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 9 - Cambridge Road / Flying C Road / Crazy Horse Road (Intersection 13) – Implementation of the following improvements to the Cambridge Road / Flying C Road / Crazy Horse Road intersection would result in acceptable LOS C operation during the AM peak hour and LOS B operation during the PM peak hour:

- Install traffic signal control
- Provide coordinated traffic signal operation with eastbound off-ramp terminal intersection
- Provide one left-turn lane and a shared through / right-turn lane on the northbound and southbound approaches
- Provide protected left-turn phasing on the northbound and southbound approaches

Implementation of this improvement would result in acceptable LOS E or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement



consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 10 - Latrobe Road / Town Center Boulevard (Intersection 21) –Implementation of the following improvements to the Latrobe Road / Town Center Boulevard intersection will result in acceptable LOS C conditions during the PM peak hour:

- Convert the northbound right-turn lane to a shared through / right-turn lane.
- Add an additional receiving lane on the north leg of the intersection that connects to the northbound right-turn lane at El Dorado Hills Boulevard / Latrobe Rd / US 50 eastbound ramps.

Implementation of this improvement would result in acceptable LOS E or better operations during the AM and PM peak hours. With this improvement, this impact would be **less than significant**.

The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 11 - Latrobe Road / White Rock Road (Intersection 22) –Implementation of Mitigation 10 will improve conditions at Latrobe Road / White Rock Road to acceptable LOS C operations. Therefore, this impact is **less than significant**.



TABLE 16: INTERSECTION LOS AND DELAY – EXISTING PLUS PROJECT MITIGATIONS

Intersection	LOS Target	Control	Existing Conditions		Existing + Project Conditions		Existing + Project Mitigations	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
4. Bass Lake Road / Country Club Drive	D	SSSC	F / >180	C / 22	<u>F / > 180</u>	<u>F / 129</u>	C / 23	B / 11
5. Bass Lake Road / US WB 50 Ramps	D	SSSC / Signal	B / 11	C / 16	<u>F / > 180</u>	<u>F / > 180</u>	B / 13	B / 15
6. Bass Lake Road / US EB 50 Ramps	D	SSSC / Signal	C / 20	F / 58	<u>F / > 180</u>	<u>F / > 180</u>	C / 26	D / 41
7. Marble Valley Road / Marble Mountain Road	D	SSSC	A / 9	A / 9	<u>F / > 180</u>	<u>F / > 180</u>	C / 15	D / 26
8. Marble Valley Road / Marble Ridge Road	D	SSSC	A / 9	A / 9	<u>F / > 180</u>	<u>F / > 180</u>	C / 25	D / 34
9. Cambridge Road / Country Club Drive	E	AWSC	E / 39	C / 18	<u>F / 88</u>	E / 39	E / 42	D / 34
10. Cambridge Road / Knollwood Drive	E	SSSC / Signal	F / 82	E / 41	<u>F / 164</u>	<u>F / 77</u>	C / 25	B / 15
12. Cambridge Road / US 50 EB Ramps	E	SSSC / Signal	B / 14	E / 45	<u>F / 108</u>	<u>F / > 180</u>	B / 12	C / 24
13. Cambridge Road / Flying C Road / Crazy Horse Road	E	SSSC / Signal	B / 12	B / 11	<u>F / > 180</u>	D / 29	C / 22	B / 13
21. Latrobe Road / Town Center Boulevard	E	Signal	B / 16	D / 50	B / 18	<u>F / 88</u>	B / 17	D / 45



TABLE 16: INTERSECTION LOS AND DELAY – EXISTING PLUS PROJECT MITIGATIONS

Intersection	LOS Target	Control	Existing Conditions		Existing + Project Conditions		Existing + Project Mitigations	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
22. Latrobe Road / White Rock Road	E	Signal	C / 31	C / 27	C / 32	<u>F / 142</u>	C / 32	C / 30

Notes: AWSC = all-way stop control, SSSC = side-street stop control

Bold text indicates LOS worse than established threshold. Italic and underlined text identifies a potential impact.

The average delay is measured in seconds per vehicle. For signalized and AWSC intersections, the delay shown is the average control delay for the overall intersection. For SSSC intersections, the LOS and control delay for the worst movement is shown. Intersections 4-10 and 12-13 are analyzed in Synchro. Intersections 21 and 22 are analyzed in SimTraffic.

Intersection LOS and delay is calculated based on the procedures and methodology contained in the *HCM*

Source: Fehr & Peers, 2018



7.1.2 FREEWAY FACILITIES

The addition of project traffic will impact US 50 operations under existing conditions. The analysis results are presented in Table 17.

Impacts

- Impact 12 - US 50 / Westbound Bass Lake Road On-Ramp – The addition of project traffic will result in LOS F conditions at the US 50 westbound on-ramp from Bass Lake Road during the AM peak hour. **This is a significant impact.**
- Impact 13 - US 50 Westbound Weave segment between Silva Valley Parkway on-ramp and El Dorado Hills Boulevard off-ramp – The addition of project traffic will result in LOS F conditions at the weave segment of US 50 westbound between the Silva Valley Parkway on-ramp and the El Dorado Hills Boulevard off-ramp during the AM peak hour. **This is a significant impact.**
- Impact 14 - US 50 / Westbound El Dorado Hills Boulevard On-Ramp – The addition of project traffic will result in LOS F conditions at the US 50 westbound on-ramp from El Dorado Hills Boulevard during the AM peak hour. **This is a significant impact.**

Mitigation

- Mitigation 12 - US 50 / Westbound Bass Lake Road On-Ramp – Implementation of CIP project number 53117 (US 50 Auxiliary Lane Westbound – Bass Lake Road to Silva Valley Parkway) improvement, which is in the County's 10-year CIP, would result in acceptable LOS D (or better) and LOS B operations at westbound on-ramp merge area during the AM and PM peak hours, respectively. With this improvement, this impact would be **less than significant**.

If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

- Mitigation 13 - US 50 / Westbound El Dorado Hills Boulevard Off-Ramp – Implementation of CIP project number 72377 (Country Club Drive Extension – El Dorado Hills Boulevard to Silva Valley Parkway), which is currently in the 20-year CIP, would result in acceptable LOS D and LOS B operations at westbound on-ramp merge area during the AM and PM peak hours, respectively. With this improvement, this impact would be **less than significant**.



The analysis of the project under existing conditions assumes that the entire project develops immediately. However, development of the proposed project is anticipated to occur over 20 or more years. Consequently, the phasing of offsite infrastructure improvement is not certain and will be influenced by the following factors:

- The rate and location of regional development
- The location of development within the project site
- The type of development within the project site
- The implementation of roadway improvement constructed by others

If constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program.

Mitigation 14 - US 50 / Westbound El Dorado Hills Boulevard On-Ramp – Implementation of CIP project number 71324 (Saratoga Way Extension – Phase 1) , which is in the County's five-year CIP, would result in acceptable LOS C operations at westbound on-ramp merge area during the AM and PM peak hours.

With this improvement, this impact would be **less than significant**.

If Saratoga Way Phase I is constructed by others prior to residential development levels in the project site that would require this mitigation, payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards this improvement. If not constructed by others, the applicant would be responsible for implementing this improvement consistent with General Plan Goal TC-X and supporting Policy TC-Xf to ensure that transportation improvements are implemented concurrent with approved residential development. If constructed by the applicant, the applicant would be subject to fee credit or reimbursement through the County's traffic impact mitigation fee program. The other improvements are either under construction or included in the County's 10-year CIP, and if Saratoga Way Phase I is constructed by others or included in the County's 10-year CIP payment of traffic impact mitigation fees would satisfy the project's fair share obligation towards these improvements.



**TABLE 17: FREEWAY FACILITY PEAK HOUR LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS
 MITIGATION**

Freeway	Segment	Facility Type	Existing Density ¹ / LOS		Existing + Project Density ¹ / LOS		Existing + Project Mitigation Density ¹ / LOS	
			AM	PM	AM	PM	AM	PM
US 50 WB	Bass Lake Rd on-ramp	Merge ²	31 / D	20 / C	<u>- / F</u>	26 / C	31 / D	21 / C
							23 / C	14 / B
	El Dorado Hills Blvd off-ramp	Diverge / Leisch ³	33 / D	22 / C	<u>- / F</u>	28 / D	- / D	16 / B
	El Dorado Hills Blvd on-ramp	Merge	34 / D	24 / C	<u>- / F</u>	28 / D	28 / C	22 / C

Notes: ¹Density reported as passenger cars per mile per lane. Density is not reported for LOS F operations. Analysis based on HCM 2010. Weave segment's operations are based on the HCM 2010 and Leisch Method. If the weave segment is outside the realm of weaving, it is analyzed as a basic segment.

²Mitigation scenario reflects interchange improvements that includes a loop and slip on-ramp

³Mitigation scenario includes Silva Valley interchange, therefore is analyzed as a weave segment using the Leisch Method or a basic segment.

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

Source: Fehr & Peers, 2018

7.2 CUMULATIVE PLUS PROJECT

Analysis results, which are presented in Table 18, indicate that the addition of the project would exacerbate unacceptable operations at 12 study intersections and result in unacceptable operations at two intersections. The following discusses these impacts and associated mitigation:

7.2.1 INTERSECTIONS

Impacts

- Impact 15 - Bass Lake Road / US 50 eastbound ramps (Intersection 6) – This intersection is located in the County's Rural Region and is subject to the LOS D significance threshold. This intersection will operate unacceptably at LOS F without the project during the AM peak hour. According to established significance criteria, the project is projected to "significantly worsen" conditions, since it would add more than 10 trips to the



intersection during the AM peak hour and result in unacceptable LOS F conditions during the PM peak hour. Poor operation at this intersection will result in vehicle queuing on the eastbound off ramp during the PM peak hour that could cause vehicles to spill back to the US 50 mainline, impacting mainline operations. **This is a significant impact.**

- Impact 16 - Marble Valley Parkway / Marble Mountain Road (Intersection 7) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection will operate acceptably at LOS D without the project during the AM and PM peak hours. The project results in unacceptable (LOS E and LOS F) conditions during the AM and PM peak hours, respectively. **This is a significant impact.**
- Impact 17 - Marble Valley Parkway / Marble Ridge Road (Intersection 8) – This intersection is located in the County’s Rural Region and is subject to the LOS D significance threshold. This intersection will operate acceptably at LOS C and D during the AM and PM peak hours, respectively. The project will also result in unacceptable (LOS F) conditions during the PM peak hour. **This is a significant impact.**
- Impact 18 - Cambridge Road / Country Club Drive (Intersection 9) – This intersection will operate at LOS F without the project during the AM and PM peak hours. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM and PM peak hours. **This is a significant impact.**
- Impact 19 - Cambridge Road / Knollwood Drive (Intersection 10) – This intersection will operate at LOS F without the project during the AM and PM peak hours. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM and PM peak hours. **This is a significant impact.**
- Impact 20 - Cambridge Road / US 50 westbound ramps (Intersection 11) – This intersection will operate at LOS F during the AM without the project. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the AM peak hour. The project will also results in LOS F during the PM peak hour. **This is a significant impact.**
- Impact 21 - Cambridge Road / Flying C Road / Crazy Horse Road (Intersection 13) – This intersection will operate at LOS F without the project during the PM peak hour. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the intersection during the PM peak hour. The project would also result in LOS F during the AM peak hour. **This is a significant impact.**

Mitigation



Mitigation 15 - Bass Lake Road / US 50 eastbound ramps (Intersection 6) –Implementation of the following improvements would provide LOS D or better operations in the AM and PM peak hours:

- Install traffic signal control
- Provide two through lanes and a separate right-turn lane on the northbound approach
- Provide one left-turn lane and two through lanes on the southbound approach
- Provide one left-turn lane, a shared left / through / right-turn lane, and a separate right-turn lane on the eastbound approach

With this improvement, this impact would be **less than significant**.

The Cumulative analysis includes planned roadway improvements, growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects within the study area. This is found to be an impact in the cumulative scenario without the project, which includes other foreseeable but unapproved projects. Therefore, the project is responsible for its proportional share of the proposed mitigation under cumulative conditions. Since the impact is identified under the cumulative scenario, the timing of the improvement is a function of the rate of population and employment growth. The County's traffic impact mitigation fee program provides a mechanism for collecting fair share contributions for improvements in the 2016 CIP.

The CIP includes a line item for unprogrammed traffic signal installation and operational and safety improvements at intersections, including improvements like construction of new traffic signals, construction of turn pockets, and the upgrade of existing traffic signal systems. The County annually monitors intersections with potential need for improvement through the Intersection Needs Prioritization Process. The Intersection Needs Prioritization Process is then used to inform the annual update to the CIP, and potential intersection improvements can be added, by the Board of Supervisors, to the CIP as funding becomes available.

Therefore, appropriate mitigation, as determined by the CDA, would include payment of traffic impact mitigation fees to satisfy the project's fair share obligation towards this improvement or construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others.

Mitigation 16 - Marble Valley Parkway / Marble Mountain Road (Intersection 7) – Implementation of the following improvements would provide acceptable LOS D or better operations:

- Restrict access to right-in / right-out and left-turn in movements only.



- Provide an uncontrolled U-turn movement just east of Marble Ridge Road to accommodate the restricted turn movements.

With this improvement, this impact would be **less than significant**.

Mitigation 17 - Marble Valley Parkway / Marble Ridge Road (Intersection 8) – Implementation of the Mitigation 16 would provide acceptable LOS D or better operations. With this improvement, this impact would be **less than significant**.

- Restrict access to right-in / right-out and left-turn in movements only.
- Provide an uncontrolled U-turn movement just east of Marble Ridge Road to accommodate the restricted turn movements.

With this improvement, this impact would be **less than significant**.

Mitigation 18 - Cambridge Road / Country Club Drive (Intersection 9) – Implementation of the following improvements to the Cambridge Road / Country Club Drive intersection would result in acceptable LOS C or better operation during the AM and PM peak hours:

- Provide one left-turn lane and a shared through / right-turn lane on the northbound approach.
- Provide one shared left-turn / through lane and one right turn lane on the southbound approach.

With this improvement, this impact would be **less than significant**.

The Cumulative analysis includes planned roadway improvements, growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects within the study area. This is found to be an impact in the cumulative scenario without the project, which includes other foreseeable but unapproved projects. Therefore, the project is responsible for its proportional share of the proposed mitigation under cumulative conditions. Since the impact is identified under the cumulative scenario, the timing of the improvement is a function of the rate of population and employment growth. The County's traffic impact mitigation fee program provides a mechanism for collecting fair share contributions for improvements in the 2016 CIP.

The CIP includes a line item for unprogrammed traffic signal installation and operational and safety improvements at intersections, including improvements like construction of new traffic signals, construction of turn pockets, and the upgrade of existing traffic signal systems. The County annually monitors intersections with potential need for improvement through the Intersection Needs Prioritization Process. The Intersection Needs Prioritization Process is then used to inform the annual update to the CIP, and



potential intersection improvements can be added, by the Board of Supervisors, to the CIP as funding becomes available.

Therefore, appropriate mitigation, as determined by the CDA, would include payment of traffic impact mitigation fees to satisfy the project's fair share obligation towards this improvement or construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others.

Mitigation 19 - Cambridge Road / Knollwood Drive (Intersection 10) –Implementation of the following improvements would provide acceptable LOS D operation during the AM and PM peak hours:

- Install traffic signal control
- Provide coordinated traffic signal operation with westbound off-ramp terminal intersection
- Provide one left-turn lane, one through lane, and one right-turn lane on the northbound approach
- Provide one left-turn lane, a through lane, and a shared through / right-turn lane on the southbound approach
- Provide a shared left-turn / through lane and a right-turn lane on the eastbound approach
- Provide a left-turn lane and shared through / right-turn lane on the westbound approach
- Provide split phasing eastbound and westbound and protected left-turn phasing on the northbound and southbound approaches.

The Cumulative analysis includes planned roadway improvements, growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects within the study area. This is found to be an impact in the cumulative scenario without the project, which includes other foreseeable but unapproved projects. Therefore, the project is responsible for its proportional share of the proposed mitigation under cumulative conditions. Since the impact is identified under the cumulative scenario, the timing of the improvement is a function of the rate of population and employment growth. The County's traffic impact mitigation fee program provides a mechanism for collecting fair share contributions for improvements in the 2015 CIP.

The CIP includes a line item for unprogrammed traffic signal installation and operational and safety improvements at intersections, including improvements like construction of



new traffic signals, construction of turn pockets, and the upgrade of existing traffic signal systems. The County annually monitors intersections with potential need for improvement through the Intersection Needs Prioritization Process. The Intersection Needs Prioritization Process is then used to inform the annual update to the CIP, and potential intersection improvements can be added, by the Board of Supervisors, to the CIP as funding becomes available.

Mitigation 20 - Cambridge Road / Merrychase Drive / US 50 westbound ramps (Intersection 11) – Implementation of the following improvements to the Cambridge Road / Merrychase Drive / US 50 westbound ramps intersection would result in acceptable LOS E operation during the AM and PM peak hours:

- Modify traffic signal control
- Provide one left-turn lane, two through lanes, and a right-turn lane (to the loop on-ramp) on the northbound approach
- Provide one left-turn lane, one through lane, and a shared through / right-turn lane on the southbound approach
- Provide a shared through / left-turn lane and a right-turn lane on the eastbound approach
- Provide two left-turn lanes, a shared through / right-turn lane, and a separate right-turn lane on the westbound approach

The Cumulative analysis includes planned roadway improvements, growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects within the study area. This is found to be an impact in the cumulative scenario without the project, which includes other foreseeable but unapproved projects. Therefore, the project is responsible for its proportional share of the proposed mitigation under cumulative conditions. Since the impact is identified under the cumulative scenario, the timing of the improvement is a function of the rate of population and employment growth. The County's traffic impact mitigation fee program provides a mechanism for collecting fair share contributions for improvements in the 2015 CIP.

The CIP includes a line item for unprogrammed traffic signal installation and operational and safety improvements at intersections, including improvements like construction of new traffic signals, construction of turn pockets, and the upgrade of existing traffic signal systems. The County annually monitors intersections with potential need for improvement through the Intersection Needs Prioritization Process. The Intersection Needs Prioritization Process is then used to inform the annual update to the CIP, and potential intersection improvements can be added, by the Board of Supervisors, to the CIP as funding becomes available.



Therefore, appropriate mitigation, as determined by the CDA, would include payment of traffic impact mitigation fees to satisfy the project's fair share obligation towards this improvement or construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others.

Mitigation 21 - Cambridge Road / Flying C Road / Crazy Horse Road (Intersection 13) – Implementation of the following improvements to the Cambridge Road / Flying C Road / Crazy Horse Road intersection would result in acceptable LOS C operation during the AM and PM peak hours:

- Install traffic signal control
- Provide coordinated traffic signal operation with Cambridge Road interchange terminal intersections
- Provide one left-turn lane, one through lane, and a shared through / right-turn lane on the northbound approach
- Provide one left-turn lane, one through lane, and a right-turn lane on the southbound approach
- Provide a shared left / through / right-turn lane on the eastbound and westbound approach

The Cumulative analysis includes planned roadway improvements, growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects within the study area. This is found to be an impact in the cumulative scenario without the project, which includes other foreseeable but unapproved projects. Therefore, the project is responsible for its proportional share of the proposed mitigation under cumulative conditions. Since the impact is identified under the cumulative scenario, the timing of the improvement is a function of the rate of population and employment growth. The County's traffic impact mitigation fee program provides a mechanism for collecting fair share contributions for improvements in the 2016 CIP.

The CIP includes a line item for unprogrammed traffic signal installation and operational and safety improvements at intersections, including improvements like construction of new traffic signals, construction of turn pockets, and the upgrade of existing traffic signal systems. The County annually monitors intersections with potential need for improvement through the Intersection Needs Prioritization Process. The Intersection Needs Prioritization Process is then used to inform the annual update to the CIP, and potential intersection improvements can be added, by the Board of Supervisors, to the CIP as funding becomes available.



Therefore, appropriate mitigation, as determined by the CDA, would include payment of traffic impact mitigation fees to satisfy the project's fair share obligation towards this improvement or construction of the improvement with reimbursement or fee credit for costs that exceed the project's proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others.



TABLE 18: INTERSECTION LOS AND DELAY – CUMULATIVE PLUS PROJECT MITIGATIONS

Intersection	Control	Cumulative Conditions		Cumulative + Project Conditions		Cumulative + Project Mitigations	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
6. Bass Lake Road / US EB 50 Ramps	Signal	F / 92	C / 22	<u>F / >180</u>	<u>F / >180</u>	D / 41	C / 31
7. Marble Valley Road / Marble Mountain Road	SSSC	B / 11	B / 13	<u>E / 43</u>	<u>F / 55</u>	C / 16	C / 21
8. Marble Valley Road / Marble Ridge Road	SSSC	B / 11	B / 13	D / 27	<u>F / 54</u>	B / 14	C / 21
9. Cambridge Road / Country Club Drive	AWSC / Signal	F / 154	F / 99	<u>F / >180</u>	<u>F / 163</u>	B / 16	C / 32
10. Cambridge Road / Knollwood Drive	SSSC ¹ / Signal	F / -	F / -	<u>F / -</u>	<u>F / -</u>	E / 57	D / 51
11. Cambridge Road / Merrychase Drive / US 50 WB Ramps	Signal	F / 113	E / 60	<u>F / 170</u>	<u>F / 127</u>	E / 76	D / 52
13. Cambridge Road / Flying C Road / Crazy Horse Road	SSSC / Signal	E / 39	F / 72	<u>F / >180</u>	<u>F / >180</u>	C / 34	C / 35

Note: SSSC = side-street stop control, AWSC = all-way stop control

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

The average delay is measured in seconds per vehicle. For signalized and AWSC intersections, the delay shown is the average control delay for the overall intersection. For SSSC intersections, the LOS and control delay for the worst movement is shown. Intersections are analyzed in Synchro

¹ Analyzed with HCM 2000 Methodology

Source: Fehr & Peers, 2018



7.2.2 ROADWAYS

Analysis results, which are presented in Table 19, indicate that the addition of the project would significantly worsen unacceptable operations on one study roadway segment. The following discusses this impact and associated mitigation:

Impact 22 - Bass Lake Road (Hollow Oak Drive to Country Club Drive) – This roadway segment would operate unacceptably at LOS F without the project during the AM peak hour. According to established significance criteria, the project is projected to “significantly worsen” conditions, since it would add more than 10 trips to the roadway segment during the PM peak hour. **This is a significant impact.**

Mitigation 22 - Bass Lake Road (Hollow Oak Drive to Country Club Drive) – Implementation of the following improvements to this segment of Cameron Park Drive would result in acceptable LOS C or better operations during the AM and PM peak hours:

- Widen the segment of Bass Lake Road from a two-lane arterial to a four-lane (undivided or divided) arterial.

The Cumulative analysis includes planned roadway improvements, growth consistent with the 2004 General Plan, and with approved and reasonably foreseeable projects within the study area. This is found to be an impact in the cumulative scenario without the project, which includes other foreseeable but unapproved projects. Therefore, the project is responsible for its proportional share of the proposed mitigation under cumulative conditions. Since the impact is identified under the cumulative scenario, the timing of the improvement is a function of the rate of population and employment growth. The County’s traffic impact mitigation fee program provides a mechanism for collecting fair share contributions for improvements in the 2016 CIP.

Therefore, appropriate mitigation, as determined by the CDA, would include payment of traffic impact mitigation fees to satisfy the project’s fair share obligation towards this improvement or construction of the improvement with reimbursement or fee credit for costs that exceed the project’s proportional share if the improvement is needed but not included in future updates to the CIP or constructed by others.

TABLE 19: ROADWAY SEGMENT PEAK HOUR LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS MITIGATIONS



Roadway	Segment	Facility Type	Cumulative Volume / Volume – Capacity (V / C) Ratio / LOS		Cumulative + Project Volume / Volume – Capacity (V / C) Ratio / LOS		Cumulative + Project Mitigation Volume / Volume – Capacity (V / C) Ratio / LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Bass Lake Road	Hollow Oak Drive to Country Club Drive	2 lane arterial	1,680 / 1.02 / F	1,540 / 0.93 / D	1,720 / 1.04 / F	1,540 / 0.93 / D		
		4 lane arterial (Undivided)					1,720 / 0.55 / C ¹	1,540 / 0.49 / C ¹
		4 lane arterial (Divided)					1,720 / 0.52 / C	1,540 / 0.49 / C

Notes: ¹LOS at this location is C or better

Volume-to-Capacity ratio and LOS is based on the HCM 2010 peak hour level of service thresholds

Bold text indicates LOS worse than established threshold. *Italic and underlined* text identifies a potential impact.

Source: Fehr & Peers, 2018

7.2.3 PEDESTRIAN AND BICYCLE FACILITIES

Impact 32 - Implementation of the proposed project will increase demand for pedestrian and bicycle facilities. As outlined in Section 6.3, the project proposes pedestrian and bicycle facilities that will connect and integrate with existing and planned facilities adjacent to the project. In addition, elements of the proposed project will provide new recreational opportunities. Therefore, the proposed project will not conflict with adopted policies, plans, or programs regarding bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. **This is a less than significant impact.**

Mitigation 32 - No mitigation required

7.2.4 TRANSIT

Impact 33 - Implementation of the proposed project will increase demand transit. As outlined in Section 6.4, the project could result in demand of about 8,400 transit commute trips annually, which would be an average of about 32 commute trips per weekday. This increase represents about a 20 percent increase in El Dorado Transit Commuter Service. The growth in commute trips would not likely exceed the ability to serve this ridership growth through existing funding sources for transit that are tied to population growth. However, most of the boardings for the El Dorado Transit Commuter Service at the El



Dorado Hills park-n-ride lot are from El Dorado Hills residents. Consequently this increase in commuter trips will increase demand for the El Dorado Hills and Cameron Park park-n-ride lot, which operate at or near capacity. **This is a significant impact.**

Mitigation 33 - The project will provide a 100 to 120 space park-n-ride lot, which would accommodate the estimated demand for park-n-ride facilities anticipated by the project. Therefore, Implementation of the project, which includes park-n-ride facilities would reduce this impact to a **less than significant level.**

7.2.5 EMERGENCY ACCESS

Impact 34 - The proposed project will provide two points of access from the US 50 / Bass Lake Road and US 50 / Cambridge Road interchanges and an emergency vehicle access to the west towards the Valley View and East Ridge Specific Plan areas for emergency vehicle access. This is a **less than significant impact.**

Mitigation 34 - No mitigation required



8.0 OTHER CONSIDERATIONS

8.1.1 SITE ACCESS

Proposed circulation for the Village of Marble Valley Specific Plan is shown to the right. US 50 access will be through the US 50 / Bass Lake Road and US 50 / Cambridge Road interchanges. Marble Valley Parkway is proposed as a continuous roadway connecting the Bass Lake Road and Cambridge Road interchanges. A portion of Marble Valley Parkway is outside the plan area. Marble Lake Boulevard, which is planned as a four- to two-lane roadway, will provide be the primary access roadway with major internal intersections along are planned as roundabouts. Lime Rock Valley Boulevard will extend east of Marble Lake Boulevard as a two-lane roadway.

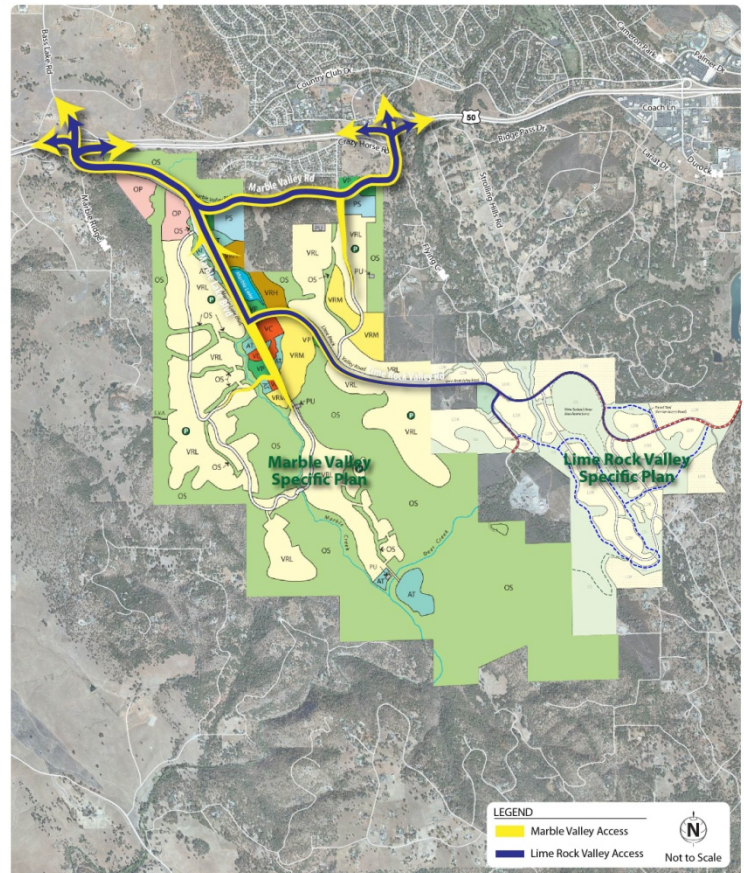


Figure 13 shows the proposed intersection layout and lane assumptions for Marble Lake Boulevard necessary to support the Village of Marble Valley and the proposed Lime Rock Valley Specific Plan, which is located just east of the proposed project given the planned access discussed above. The following summarizes the key design features of the proposed intersections:

- Intersection 1 - A two-lane roundabout with a northbound-to-eastbound right-turn bypass lane.
- Intersection 2 - A two-lane roundabout with a southbound-to-westbound right-turn bypass lane.
- Intersection 3 - A couplet intersection with one northbound and one southbound lane on Marble Lake Boulevard (uncontrolled) and stop controls at all of the minor movements (eastbound and westbound).
- Intersection 4 - A two-lane roundabout with a westbound-to-northbound right-turn bypass lane.
- Intersection 5 - A single lane roundabout.



Marble Lake Boulevard would be four lanes from US 50 to just south of Intersection 2. As shown in Table 21, the study intersections would operate acceptably with the proposed lane configurations. Detailed input assumptions and analysis results are included in Appendix A.



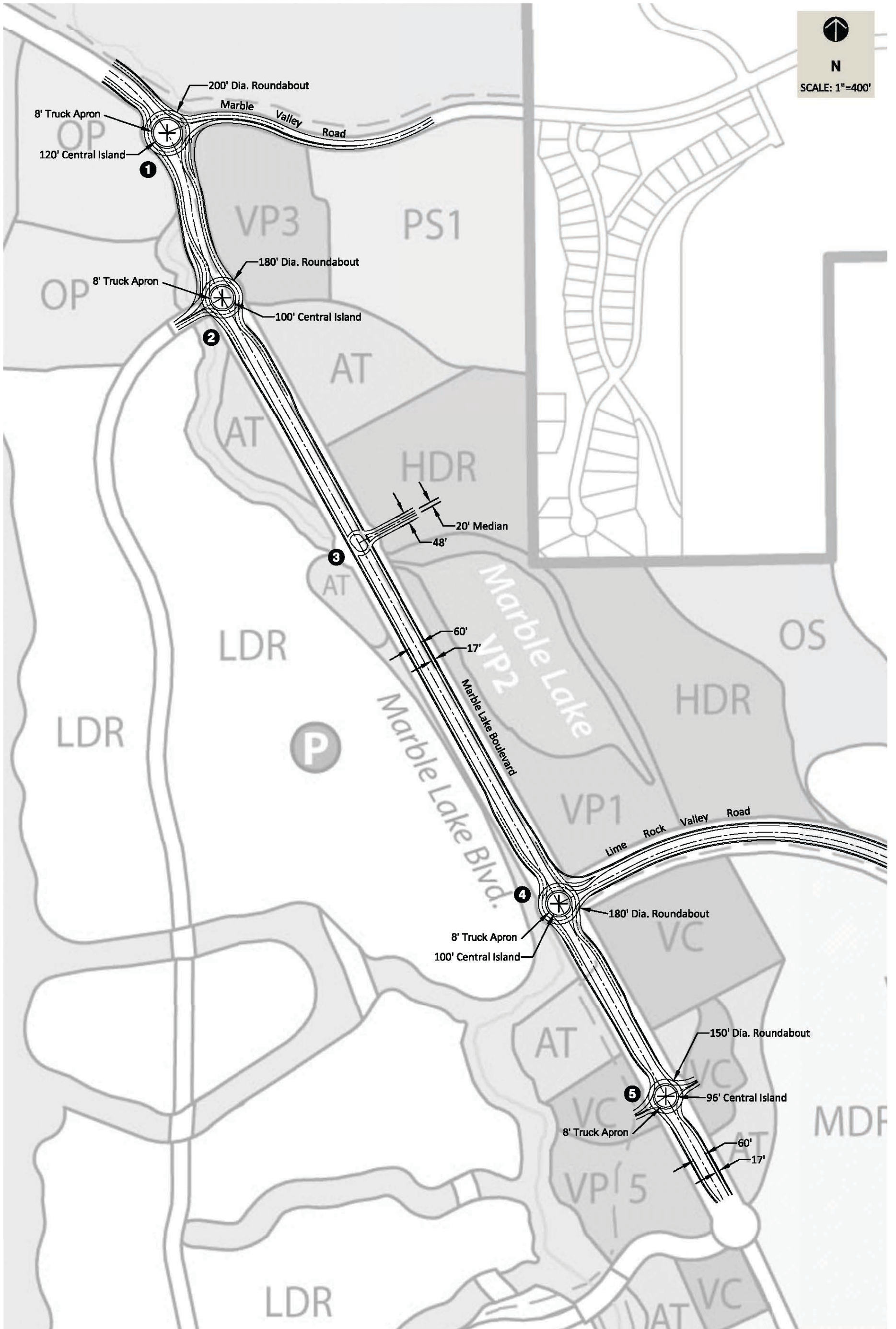


Figure 13.
Marble Lake

TABLE 21: PEAK HOUR LEVEL OF SERVICE – CUMULATIVE CONDITIONS (ON-SITE INTERSECTIONS)

Intersection	LOS Target	Traffic Control	LOS / Delay (seconds)	
			AM Peak Hour	PM Peak Hour
1. Marble Lake Boulevard (Intersection 1)	D	Roundabout	C / 17	D / 27
2. Marble Lake Boulevard (Intersection 2)	D	Roundabout	D / 32	B / 10
3. Marble Lake Boulevard (Intersection 3)	D	SSSC	D / 34	D / 30
4. Marble Lake Boulevard / Lime Rock Valley Road (Intersection 4)	D	Roundabout	C / 22	B / 13
5. Marble Lake Boulevard (Intersection 5)	D	Roundabout	A / 9	A / 9

Notes: SSSC = side-street stop-control, AWSC = all-way stop control

The average delay is measured in seconds per vehicle. For signalized and AWSC intersections, the delay shown is the average control delay for the overall intersection. For Roundabout and SSSC intersections, the LOS and control delay for the worst movement is shown. Intersection LOS and delay is calculated based on the procedures and methodology contained in the HCM (TRB, 2000). Intersections 1-14, and 17-18 are analyzed in Synchro 7. Intersections 15-16 are analyzed in SimTraffic.

Source: Fehr & Peers, 2018

8.1.2 PEAK HOUR TRAFFIC SIGNAL WARRANT EVALUATION

An evaluation of the need for traffic signal installation was conducted using the peak hour traffic signal warrant methodologies from the California Manual on Uniform Traffic Control Devices, January 2012. Tables 22 and 23 display the results of the peak hour volume warrant for existing and cumulative conditions, respectively. Under existing conditions, all of the intersections evaluated would satisfy the peak hour signal warrant during at least one peak hour except for the Cambridge Road / Country Club Drive intersection. Under cumulative conditions, all intersections evaluated would satisfy the peak hour volume warrant.



TABLE 22: PEAK HOUR SIGNAL WARRANT EVALUATION – EXISTING PLUS PROJECT CONDITIONS

Unsignalized Intersections	Peak Hour Signal Warrant Met ¹			
	Existing Conditions		Existing + Project Conditions	
	AM	PM	AM	PM
4. Bass Lake Road / Country Club Drive	Yes	No	Yes	Yes
5. Bass Lake Road / US 50 WB Ramps	No	No	Yes	Yes
6. Bass Lake Road / US 50 EB Ramps	No	No	Yes	Yes
9. Cambridge Road / Country Club Drive	No	No	No	No
10. Cambridge Road / Knollwood Drive	No	No	Yes	No
12. Cambridge Road / US 50 EB Ramps	No	Yes	Yes	Yes

Notes: ¹Based on the Peak Hour Volume warrant (for urban areas) contained in the *California Manual on Uniform Traffic Control Devices* (CA MUTCD), Caltrans, 2012.

Source: Fehr & Peers, 2018

TABLE 23: PEAK HOUR SIGNAL WARRANT EVALUATION – CUMULATIVE CONDITIONS

Unsignalized Intersections	Peak Hour Signal Warrant Met ¹			
	Cumulative Conditions		Cumulative + Project Conditions	
	AM	PM	AM	PM
7. Marble Valley Road / Marble Mountain Road	No	No	No	No
9. Cambridge Road / Country Club Drive	Yes	Yes	Yes	Yes
10. Cambridge Road / Knollwood Drive	Yes	Yes	Yes	Yes

Note: ¹Based on the Peak Hour Volume warrant (for urban areas) contained in the *California Manual on Uniform Traffic Control Devices* (CA MUTCD), Caltrans, 2012.

Source: Fehr & Peers, 2018



This analysis is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. It estimates future development-generated traffic compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration Manual on Uniform Traffic Control Devices (California MUTCD 2012 Edition). This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured, rather than forecast, traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. El Dorado County should undertake regular monitoring of actual traffic conditions and accident data, and timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.



APPENDIX A:

Existing Conditions Technical Calculations

DRAFT

All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-003 Bass Lake-Serrano
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					Westbound				Bass Lake Rd Northbound					Serrano Pkwy Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	128	18	0	146	0	0	0	0	28	16	0	0	44	4	0	29	0	33	0	223	223
07:15	0	108	23	0	131	0	0	0	0	26	20	0	0	46	11	0	35	0	46	0	223	223
07:30	0	144	20	0	164	0	0	0	0	30	13	0	0	43	7	0	63	0	70	0	277	277
07:45	0	149	23	0	172	0	0	0	0	22	32	0	0	54	7	0	69	0	76	0	302	302
Total	0	529	84	0	613	0	0	0	0	106	81	0	0	187	29	0	196	0	225	0	1025	1025
08:00	0	107	22	0	129	0	0	0	0	29	36	0	0	65	13	0	42	2	55	2	249	251
08:15	0	104	20	0	124	0	0	0	0	25	19	0	0	44	10	0	51	0	61	0	229	229
08:30	0	93	9	0	102	0	0	0	0	21	14	0	0	35	16	0	37	0	53	0	190	190
08:45	0	76	23	0	99	0	0	0	0	18	26	0	0	44	5	0	40	1	45	1	188	189
Total	0	380	74	0	454	0	0	0	0	93	95	0	0	188	44	0	170	3	214	3	856	859
16:00	0	43	13	0	56	0	0	0	0	33	84	0	0	117	30	0	27	0	57	0	230	230
16:15	0	51	20	0	71	0	0	0	0	36	92	0	0	128	20	0	22	0	42	0	241	241
16:30	0	42	14	0	56	0	0	0	0	45	84	0	0	129	27	0	31	0	58	0	243	243
16:45	0	55	16	0	71	0	0	0	0	42	99	0	0	141	36	0	23	0	59	0	271	271
Total	0	191	63	0	254	0	0	0	0	156	359	0	0	515	113	0	103	0	216	0	985	985
17:00	0	53	10	0	63	0	0	0	0	36	102	0	0	138	16	0	31	0	47	0	248	248
17:15	0	55	14	0	69	0	0	0	0	31	102	0	0	133	30	0	26	0	56	0	258	258
17:30	0	50	14	0	64	0	0	0	0	38	91	0	0	129	29	0	25	0	54	0	247	247
17:45	0	51	19	0	70	0	0	0	0	36	95	0	0	131	26	0	25	0	51	0	252	252
Total	0	209	57	0	266	0	0	0	0	141	390	0	0	531	101	0	107	0	208	0	1005	1005
Grand Total	0	1309	278	0	1587	0	0	0	0	496	925	0	0	1421	287	0	576	3	863	3	3871	3874
Apprch %	0	82.5	17.5			0	0	0		34.9	65.1	0			33.3	0	66.7					
Total %	0	33.8	7.2		41	0	0	0	0	12.8	23.9	0		36.7	7.4	0	14.9		22.3	0.1	99.9	

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-003 Bass Lake-Serrano
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 2

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Serrano Pkwy Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	144	20	164	0	0	0	0	30	13	0	43	7	0	63	70	277
07:45	0	149	23	172	0	0	0	0	22	32	0	54	7	0	69	76	302
08:00	0	107	22	129	0	0	0	0	29	36	0	65	13	0	42	55	249
08:15	0	104	20	124	0	0	0	0	25	19	0	44	10	0	51	61	229
Total Volume	0	504	85	589	0	0	0	0	106	100	0	206	37	0	225	262	1057
% App. Total	0	85.6	14.4		0	0	0		51.5	48.5	0		14.1	0	85.9		
PHF	.000	.846	.924	.856	.000	.000	.000	.000	.883	.694	.000	.792	.712	.000	.815	.862	.875

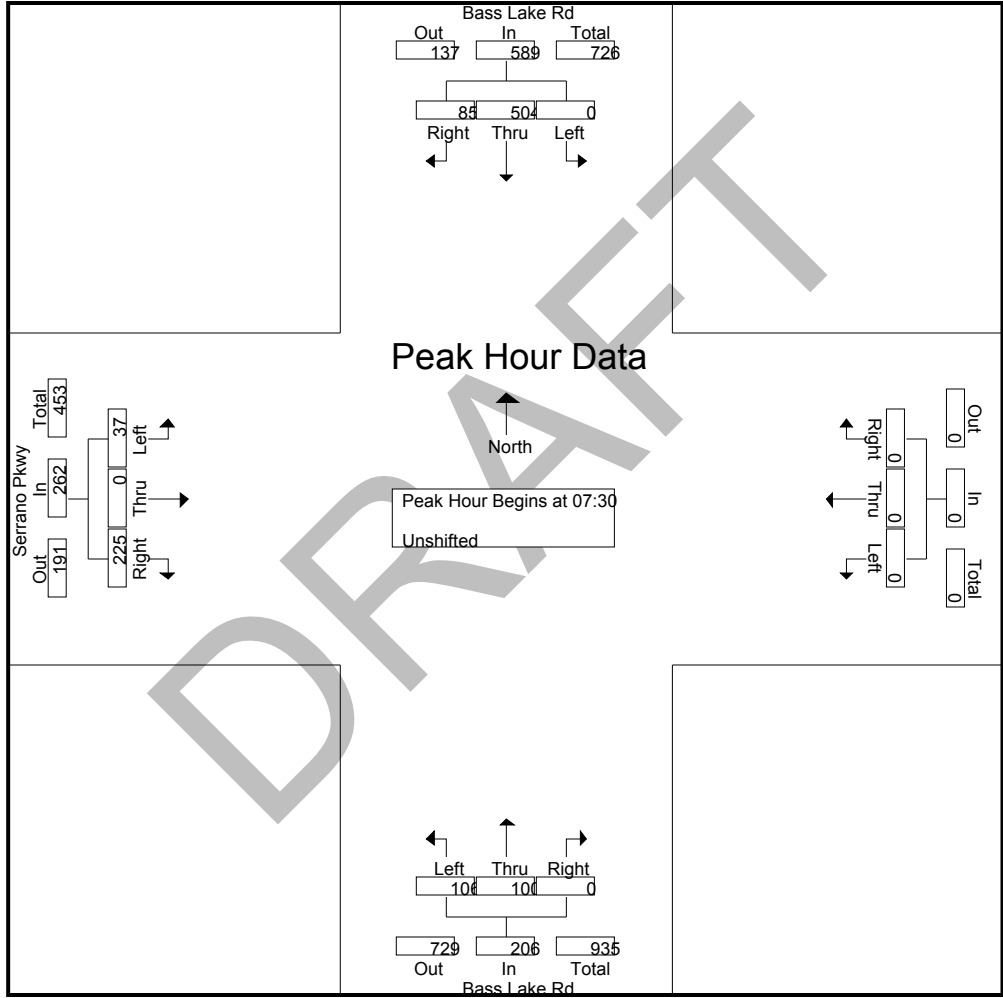
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All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-003 Bass Lake-Serrano
Site Code : 00000000
Start Date : 5/17/2012
Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-003 Bass Lake-Serrano
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 4

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Serrano Pkwy Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	55	16	71	0	0	0	0	42	99	0	141	36	0	23	59	271
17:00	0	53	10	63	0	0	0	0	36	102	0	138	16	0	31	47	248
17:15	0	55	14	69	0	0	0	0	31	102	0	133	30	0	26	56	258
17:30	0	50	14	64	0	0	0	0	38	91	0	129	29	0	25	54	247
Total Volume	0	213	54	267	0	0	0	0	147	394	0	541	111	0	105	216	1024
% App. Total	0	79.8	20.2		0	0	0		27.2	72.8	0		51.4	0	48.6		
PHF	.000	.968	.844	.940	.000	.000	.000	.000	.875	.966	.000	.959	.771	.000	.847	.915	.945

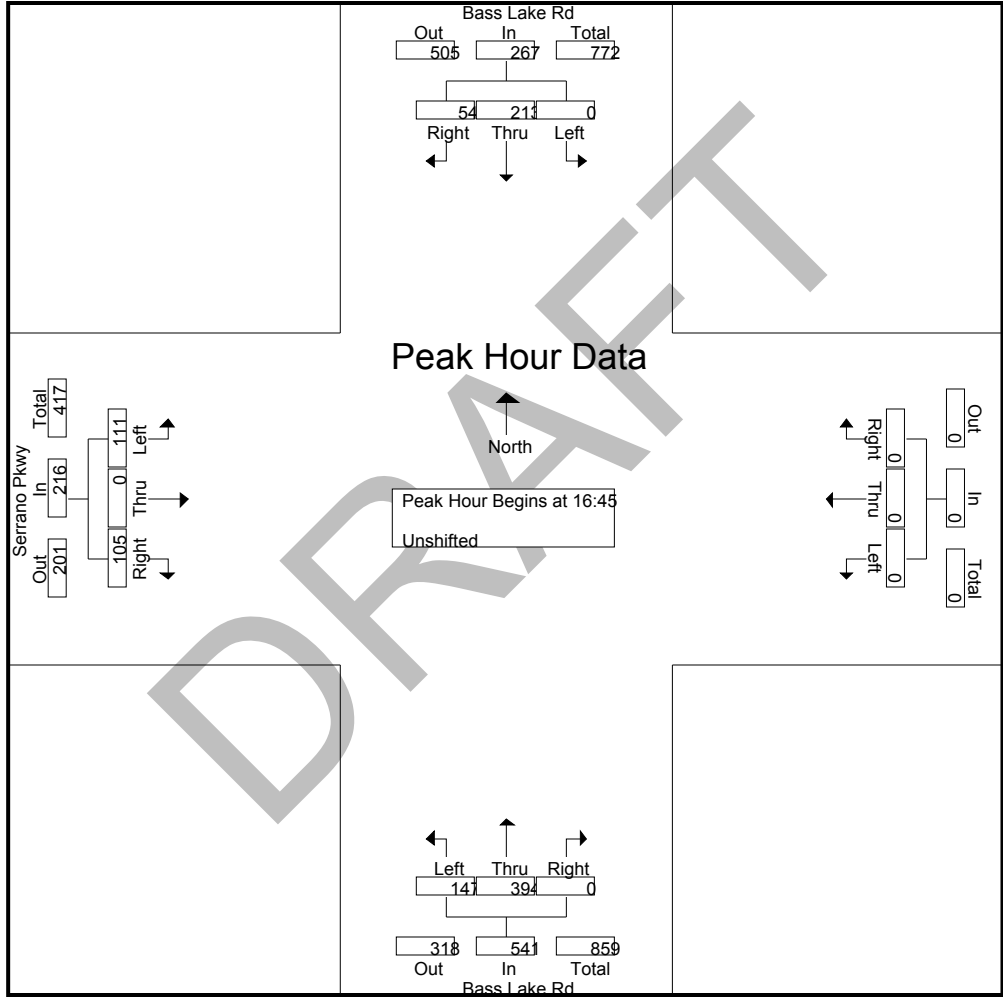
DRAFT

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-003 Bass Lake-Serrano
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 5



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-004 Bass Lake-Hollow Oak
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					Hollow Oak Dr Westbound					Bass Lake Rd Northbound					Private Driveway Eastbound					Exclu. Total	Inclu. Total	Int. Total	
	Left	Thru	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total				
07:00	0	155	0	0	155	7	0	1	0	8	0	41	3	0	44	0	0	0	0	0	0	0	207	207
07:15	1	142	0	0	143	17	0	4	0	21	0	40	2	0	42	0	0	0	0	0	0	0	206	206
07:30	0	208	0	0	208	20	0	5	0	25	0	39	6	0	45	0	0	0	0	0	0	0	278	278
07:45	4	216	0	0	220	17	0	2	0	19	0	60	8	0	68	0	0	0	0	0	0	0	307	307
Total	5	721	0	0	726	61	0	12	0	73	0	180	19	0	199	0	0	0	0	0	0	0	998	998
08:00	3	147	0	0	150	13	0	1	0	14	0	61	15	0	76	0	0	0	0	0	0	0	240	240
08:15	3	149	0	0	152	7	0	3	0	10	0	39	1	0	40	0	0	0	1	0	1	0	202	203
08:30	3	119	1	0	123	7	0	0	0	7	0	35	5	0	40	0	0	0	1	0	1	0	170	171
08:45	2	118	0	0	120	4	0	3	0	7	0	43	3	0	46	0	0	0	0	0	0	0	173	173
Total	11	533	1	0	545	31	0	7	0	38	0	178	24	0	202	0	0	0	2	0	2	0	785	787
16:00	1	70	0	0	71	2	0	0	0	2	0	120	3	0	123	0	0	0	0	0	0	0	196	196
16:15	1	74	0	0	75	12	0	2	0	14	0	130	9	0	139	1	0	0	0	1	0	0	229	229
16:30	4	66	0	0	70	2	0	2	0	4	0	127	4	0	131	0	0	0	0	0	0	0	205	205
16:45	1	79	0	0	80	5	0	2	0	7	0	142	5	0	147	0	0	0	0	0	0	0	234	234
Total	7	289	0	0	296	21	0	6	0	27	0	519	21	0	540	1	0	0	0	1	0	0	864	864
17:00	3	76	0	0	79	4	0	0	0	4	0	143	10	0	153	0	0	0	0	0	0	0	236	236
17:15	2	79	0	0	81	3	0	2	0	5	0	133	12	0	145	0	0	0	0	0	0	0	231	231
17:30	0	74	0	0	74	6	0	2	0	8	0	131	13	0	144	0	0	1	0	1	0	0	227	227
17:45	2	76	0	0	78	5	0	0	0	5	0	136	3	0	139	0	0	0	0	0	0	0	222	222
Total	7	305	0	0	312	18	0	4	0	22	0	543	38	0	581	0	0	1	0	1	0	0	916	916
Grand Total	30	1848	1	0	1879	131	0	29	0	160	0	1420	102	0	1522	1	0	1	2	2	2	2	3563	3565
Apprch %	1.6	98.4	0.1			81.9	0	18.1			0	93.3	6.7			50	0	50						
Total %	0.8	51.9	0			3.7	0	0.8		4.5	0	39.9	2.9		42.7	0	0	0		0.1	0.1	0.1	99.9	

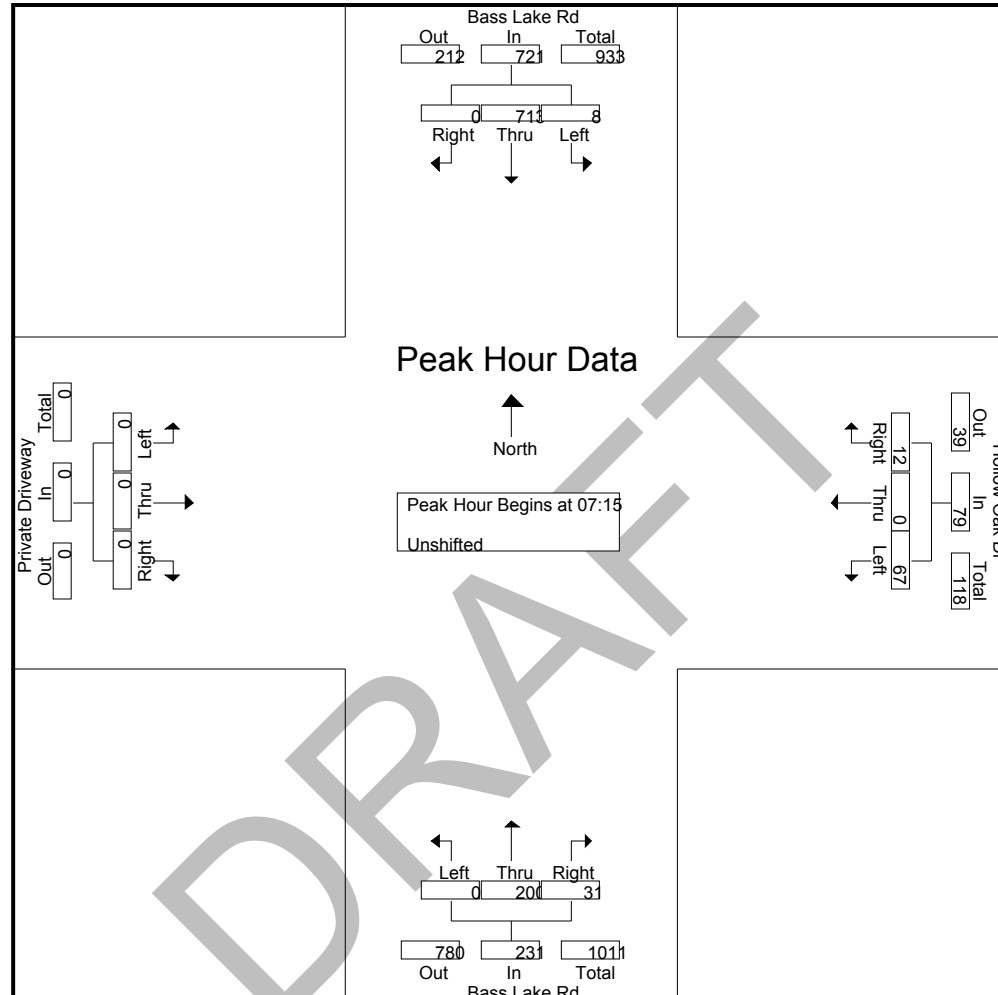
Start Time	Bass Lake Rd Southbound				Hollow Oak Dr Westbound				Bass Lake Rd Northbound				Private Driveway Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15

07:15	1	142	0	143	17	0	4	21	0	40	2	42	0	0	0	0	0	206
07:30	0	208	0	208	20	0	5	25	0	39	6	45	0	0	0	0	0	278
07:45	4	216	0	220	17	0	2	19	0	60	8	68	0	0	0	0	0	307
08:00	3	147	0	150	13	0	1	14	0	61	15	76	0	0	0	0	0	240
Total Volume	8	713	0	721	67	0	12	79	0	200	31	231	0	0	0	0	0	1031

% App. Total	1.1	98.9	0		84.8	0	15.2		0	86.6	13.4		0	0	0		
PHF	.500	.825	.000	.819	.838	.000	.600	.790	.000	.820	.517	.760	.000	.000	.000	.000	.840



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 16:45

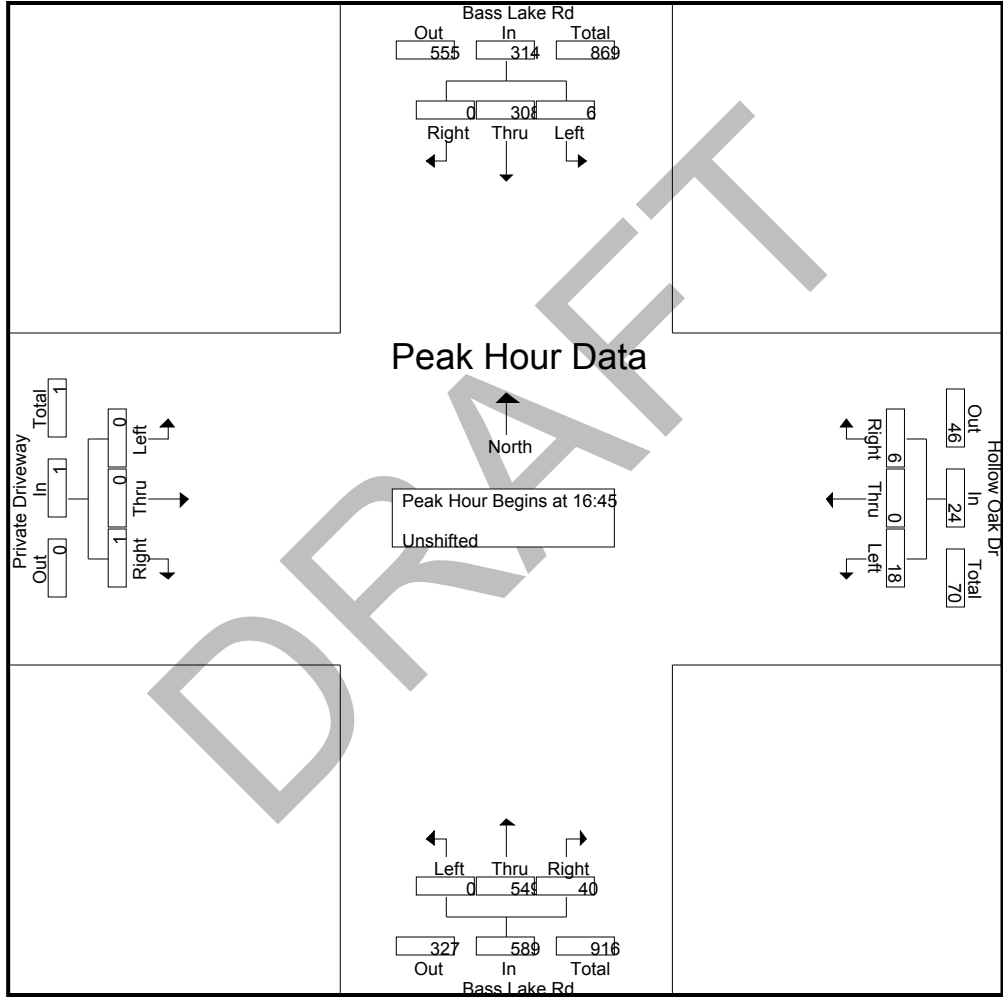
16:45	1	79	0	80	5	0	2	7	0	142	5	147	0	0	0	0	234
17:00	3	76	0	79	4	0	0	4	0	143	10	153	0	0	0	0	236
17:15	2	79	0	81	3	0	2	5	0	133	12	145	0	0	0	0	231
17:30	0	74	0	74	6	0	2	8	0	131	13	144	0	0	1	1	227
Total Volume	6	308	0	314	18	0	6	24	0	549	40	589	0	0	1	1	928
% App. Total	1.9	98.1	0		75	0	25		0	93.2	6.8		0	0	100		
PHF	.500	.975	.000	.969	.750	.000	.750	.750	.000	.960	.769	.962	.000	.000	.250	.250	.983

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-004 Bass Lake-Hollow Oak
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-005 Bass Lake-Old Bass Lake
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					Westbound				Bass Lake Rd Northbound					Old Bass Lake Rd Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	156	0	0	156	0	0	0	0	0	44	0	0	44	0	0	1	0	1	0	201	201
07:15	0	161	0	0	161	0	0	0	0	0	43	0	0	43	0	0	2	0	2	0	206	206
07:30	0	222	0	0	222	0	0	0	0	1	44	0	0	45	0	0	0	0	0	0	267	267
07:45	0	237	0	0	237	0	0	0	0	0	68	0	0	68	0	0	0	0	0	0	305	305
Total	0	776	0	0	776	0	0	0	0	1	199	0	0	200	0	0	3	0	3	0	979	979
08:00	0	164	0	0	164	0	0	0	0	0	76	0	0	76	1	0	2	0	3	0	243	243
08:15	0	166	0	0	166	0	0	0	0	3	40	0	0	43	0	0	0	1	0	1	209	210
08:30	0	131	0	0	131	0	0	0	0	1	43	0	0	44	0	0	1	0	1	0	176	176
08:45	0	117	0	0	117	0	0	0	0	0	47	0	0	47	0	0	0	1	0	1	164	165
Total	0	578	0	0	578	0	0	0	0	4	206	0	0	210	1	0	3	2	4	2	792	794
16:00	0	72	0	0	72	0	0	0	0	1	120	0	0	121	1	0	2	0	3	0	196	196
16:15	0	86	0	0	86	0	0	0	0	0	140	0	0	140	0	0	0	0	0	0	226	226
16:30	0	70	0	0	70	0	0	0	0	2	130	0	0	132	1	0	0	0	1	0	203	203
16:45	0	80	0	0	80	0	0	0	0	1	143	0	0	144	0	0	1	0	1	0	225	225
Total	0	308	0	0	308	0	0	0	0	4	533	0	0	537	2	0	3	0	5	0	850	850
17:00	0	79	0	0	79	0	0	0	0	0	159	0	0	159	1	0	0	0	1	0	239	239
17:15	0	85	0	0	85	0	0	0	0	1	147	0	0	148	0	0	1	0	1	0	234	234
17:30	0	82	0	0	82	0	0	0	0	1	141	0	0	142	0	0	1	0	1	0	225	225
17:45	0	86	0	0	86	0	0	0	0	0	143	0	0	143	0	0	1	0	1	0	230	230
Total	0	332	0	0	332	0	0	0	0	2	590	0	0	592	1	0	3	0	4	0	928	928
Grand Total	0	1994	0	0	1994	0	0	0	0	11	1528	0	0	1539	4	0	12	2	16	2	3549	3551
Apprch %	0	100	0	0		0	0	0	0	0.7	99.3	0	0		25	0	75					
Total %	0	56.2	0	0	56.2	0	0	0	0	0.3	43.1	0	0	43.4	0.1	0	0.3		0.5	0.1	99.9	

All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-005 Bass Lake-Old Bass Lake
Site Code : 00000000
Start Date : 5/17/2012
Page No : 2

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Old Bass Lake Rd Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	222	0	222	0	0	0	0	1	44	0	45	0	0	0	0	267
07:45	0	237	0	237	0	0	0	0	0	68	0	68	0	0	0	0	305
08:00	0	164	0	164	0	0	0	0	0	76	0	76	1	0	2	3	243
08:15	0	166	0	166	0	0	0	0	3	40	0	43	0	0	0	0	209
Total Volume	0	789	0	789	0	0	0	0	4	228	0	232	1	0	2	3	1024
% App. Total	0	100	0		0	0	0		1.7	98.3	0		33.3	0	66.7		
PHF	.000	.832	.000	.832	.000	.000	.000	.000	.333	.750	.000	.763	.250	.000	.250	.250	.839

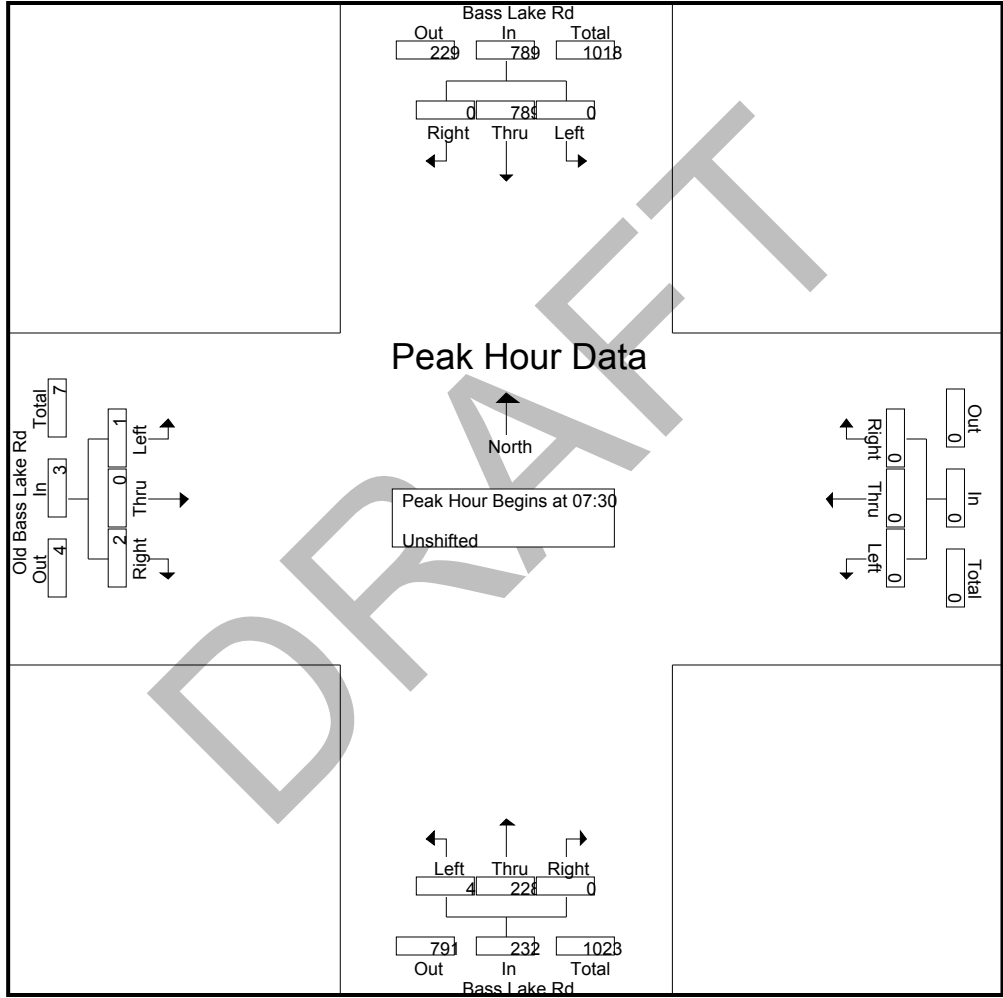
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All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-005 Bass Lake-Old Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-005 Bass Lake-Old Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 4

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Old Bass Lake Rd Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	0	79	0	79	0	0	0	0	0	159	0	159	1	0	0	1	239
17:15	0	85	0	85	0	0	0	0	1	147	0	148	0	0	1	1	234
17:30	0	82	0	82	0	0	0	0	1	141	0	142	0	0	1	1	225
17:45	0	86	0	86	0	0	0	0	0	143	0	143	0	0	1	1	230
Total Volume	0	332	0	332	0	0	0	0	2	590	0	592	1	0	3	4	928
% App. Total	0	100	0		0	0	0		0.3	99.7	0		25	0	75		
PHF	.000	.965	.000	.965	.000	.000	.000	.000	.500	.928	.000	.931	.250	.000	.750	1.000	.971

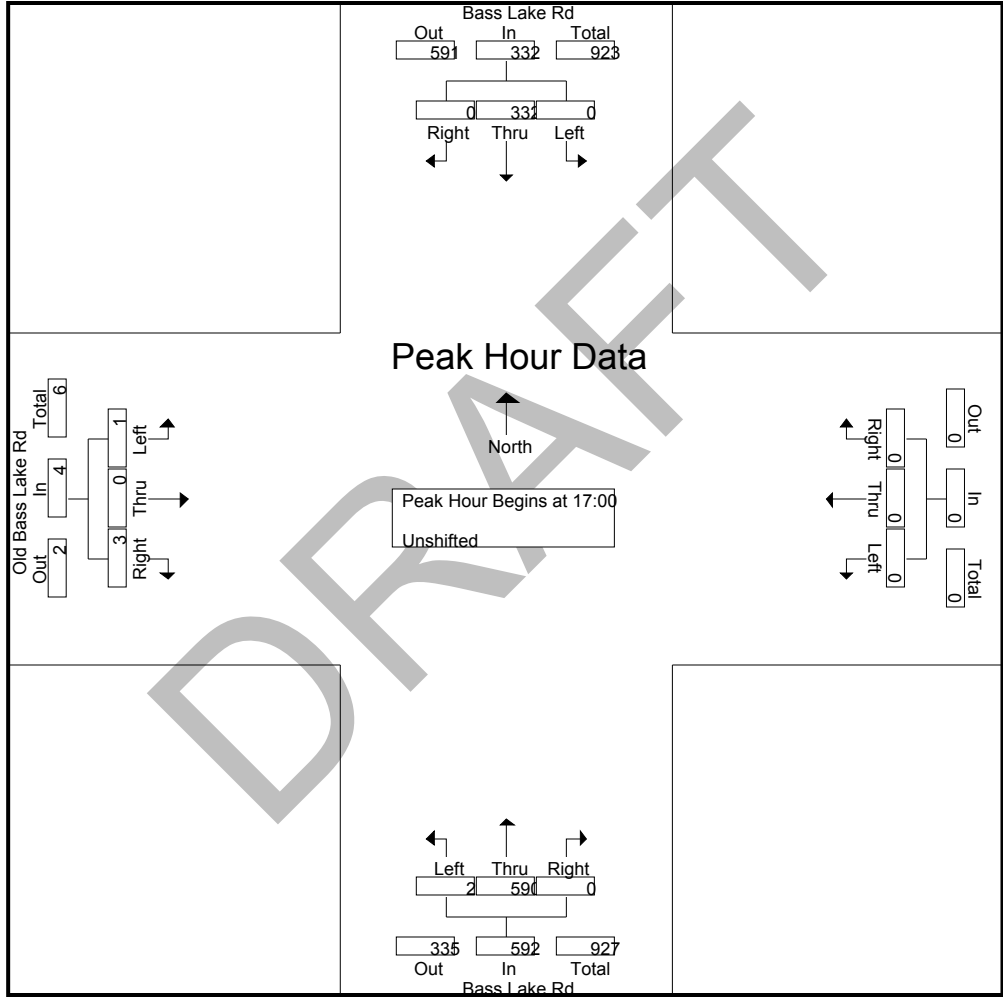
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All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-005 Bass Lake-Old Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 5



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-006 Bass Lake-Country Club
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					Country Club Dr Westbound					Bass Lake Rd Northbound					Eastbound				Exclu. Total	Inclu. Total	Int. Total	
	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	App. Total				
07:00	4	155	0	0	159	32	0	3	0	35	0	42	8	0	50	0	0	0	0	0	0	244	244
07:15	6	162	0	0	168	37	0	3	0	40	0	42	12	0	54	0	0	0	0	0	0	262	262
07:30	43	174	0	0	217	48	0	12	0	60	0	34	28	0	62	0	0	0	0	0	0	339	339
07:45	60	178	0	0	238	55	0	24	0	79	0	45	53	0	98	0	0	0	0	0	0	415	415
Total	113	669	0	0	782	172	0	42	0	214	0	163	101	0	264	0	0	0	0	0	0	1260	1260
08:00	14	155	0	0	169	55	0	28	0	83	0	46	18	0	64	0	0	0	0	0	0	316	316
08:15	16	150	0	0	166	29	0	10	0	39	0	34	25	0	59	0	0	0	0	0	0	264	264
08:30	5	133	0	0	138	17	0	5	0	22	0	40	15	0	55	0	0	0	0	0	0	215	215
08:45	9	108	0	0	117	16	0	9	0	25	0	37	11	0	48	0	0	0	0	0	0	190	190
Total	44	546	0	0	590	117	0	52	0	169	0	157	69	0	226	0	0	0	0	0	0	985	985
16:00	6	71	0	0	77	20	0	5	0	25	0	116	37	0	153	0	0	0	0	0	0	255	255
16:15	15	71	0	0	86	11	0	11	0	22	0	131	37	0	168	0	0	0	0	0	0	276	276
16:30	10	59	0	0	69	9	0	19	0	28	0	115	32	0	147	0	0	0	0	0	0	244	244
16:45	15	69	0	0	84	13	0	8	0	21	0	135	47	0	182	0	0	0	0	0	0	287	287
Total	46	270	0	0	316	53	0	43	0	96	0	497	153	0	650	0	0	0	0	0	0	1062	1062
17:00	8	72	0	0	80	13	0	12	0	25	0	149	38	0	187	0	0	0	0	0	0	292	292
17:15	13	73	0	0	86	16	0	9	0	25	0	139	44	0	183	0	0	0	0	0	0	294	294
17:30	11	70	0	0	81	15	0	14	0	29	0	131	34	0	165	0	0	0	0	0	0	275	275
17:45	15	72	0	0	87	16	0	5	0	21	0	136	35	0	171	0	0	0	0	0	0	279	279
Total	47	287	0	0	334	60	0	40	0	100	0	555	151	0	706	0	0	0	0	0	0	1140	1140
Grand Total	250	1772	0	0	2022	402	0	177	0	579	0	1372	474	0	1846	0	0	0	0	0	0	4447	4447
Apprch %	12.4	87.6	0			69.4	0	30.6			0	74.3	25.7			0	0	0					
Total %	5.6	39.8	0		45.5	9	0	4		13	0	30.9	10.7	41.5		0	0	0			0	100	

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-006 Bass Lake-Country Club
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 2

Start Time	Bass Lake Rd Southbound				Country Club Dr Westbound				Bass Lake Rd Northbound				Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	43	174	0	217	48	0	12	60	0	34	28	62	0	0	0	0	339
07:45	60	178	0	238	55	0	24	79	0	45	53	98	0	0	0	0	415
08:00	14	155	0	169	55	0	28	83	0	46	18	64	0	0	0	0	316
08:15	16	150	0	166	29	0	10	39	0	34	25	59	0	0	0	0	264
Total Volume	133	657	0	790	187	0	74	261	0	159	124	283	0	0	0	0	1334
% App. Total	16.8	83.2	0		71.6	0	28.4		0	56.2	43.8		0	0	0		
PHF	.554	.923	.000	.830	.850	.000	.661	.786	.000	.864	.585	.722	.000	.000	.000	.000	.804

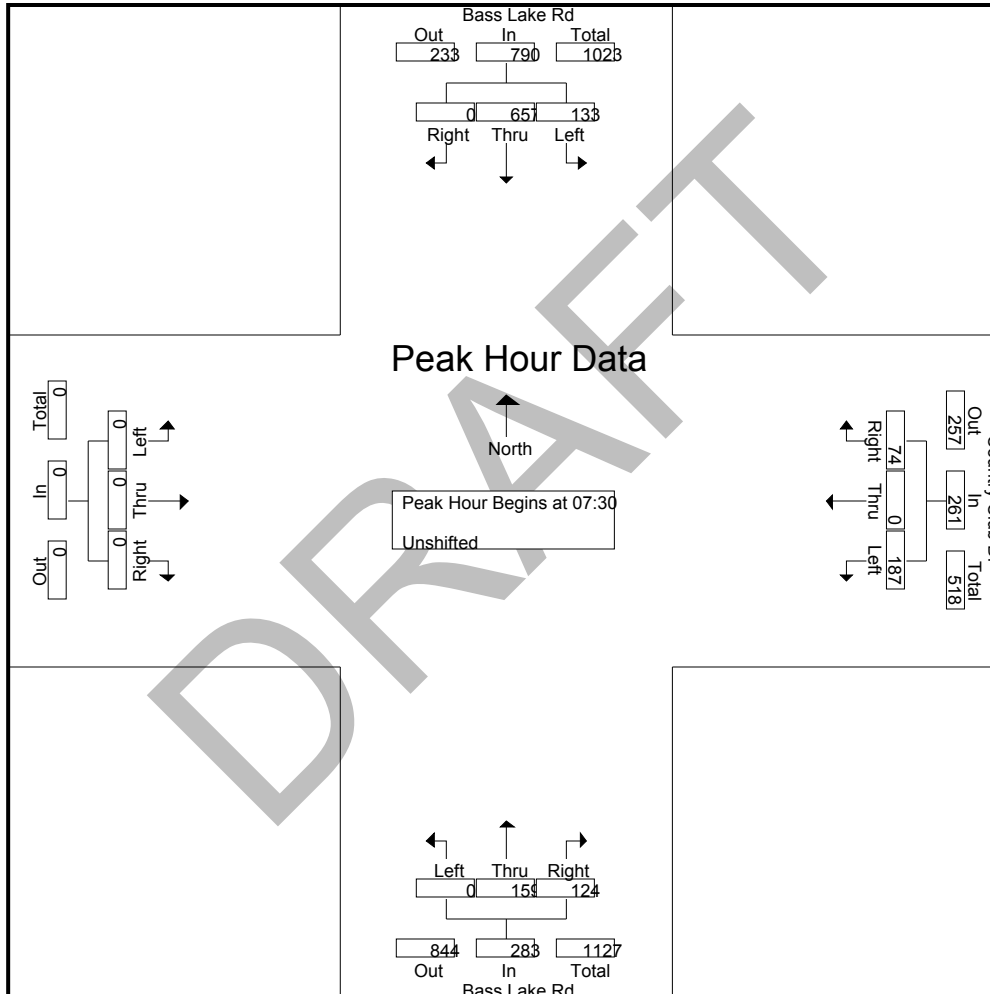
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All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-006 Bass Lake-Country Club
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-006 Bass Lake-Country Club
Site Code : 00000000
Start Date : 5/17/2012
Page No : 4

Start Time	Bass Lake Rd Southbound				Country Club Dr Westbound				Bass Lake Rd Northbound				Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	15	69	0	84	13	0	8	21	0	135	47	182	0	0	0	0	287
17:00	8	72	0	80	13	0	12	25	0	149	38	187	0	0	0	0	292
17:15	13	73	0	86	16	0	9	25	0	139	44	183	0	0	0	0	294
17:30	11	70	0	81	15	0	14	29	0	131	34	165	0	0	0	0	275
Total Volume	47	284	0	331	57	0	43	100	0	554	163	717	0	0	0	0	1148
% App. Total	14.2	85.8	0		57	0	43		0	77.3	22.7		0	0	0		
PHF	.783	.973	.000	.962	.891	.000	.768	.862	.000	.930	.867	.959	.000	.000	.000	.000	.976

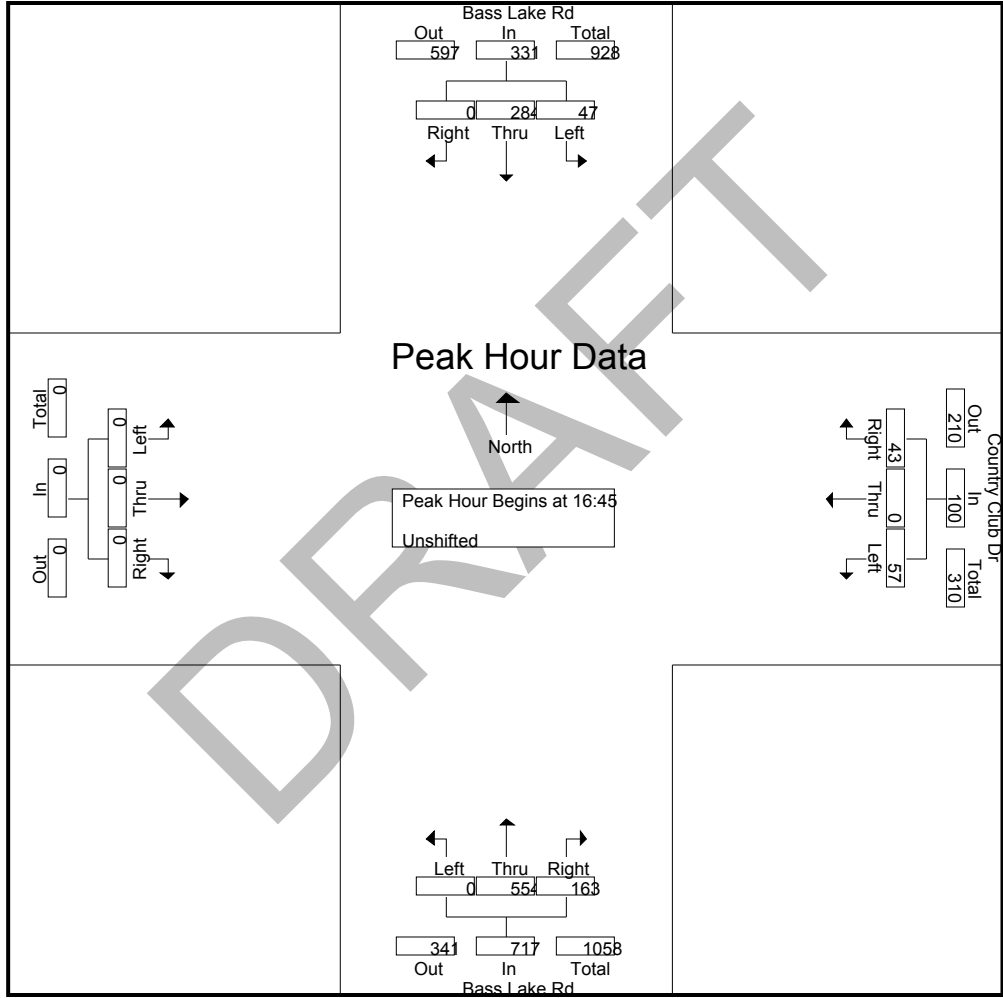
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All Traffic Data

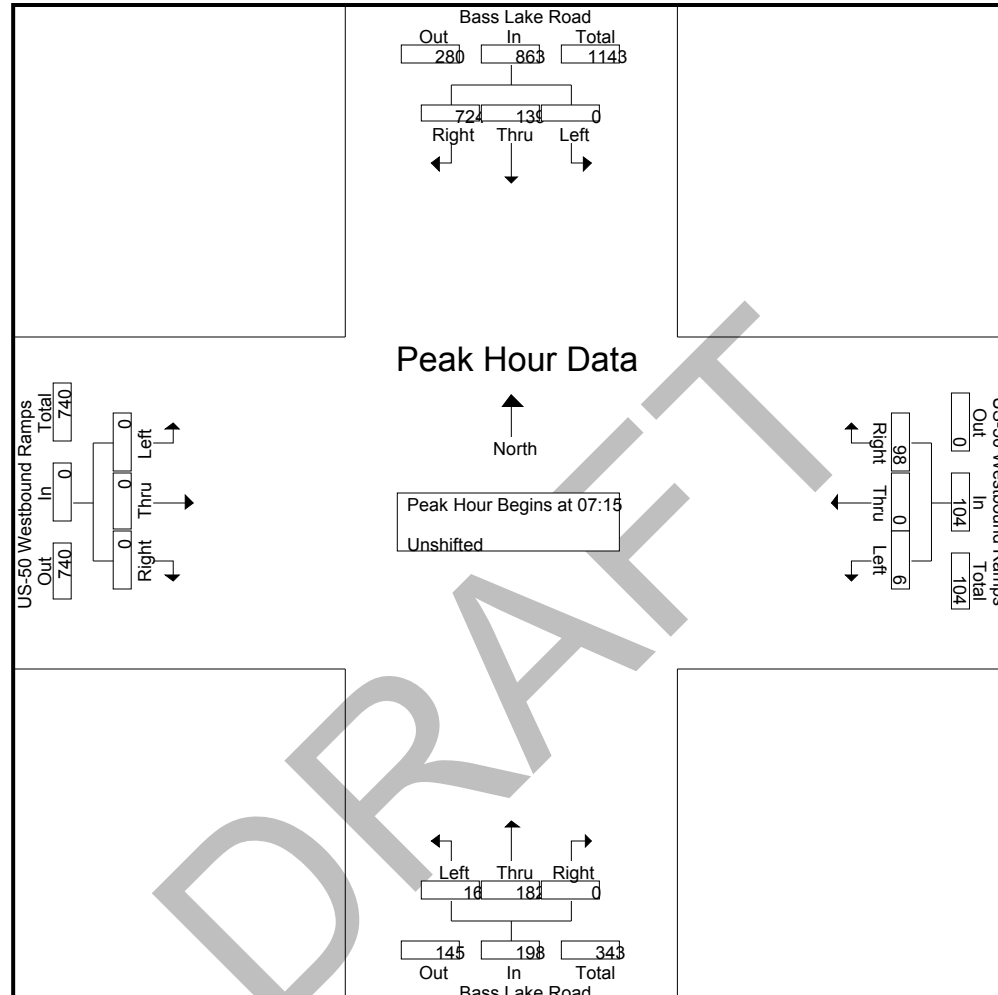
(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-006 Bass Lake-Country Club
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 5



% App. Total	0	16.1	83.9		5.8	0	94.2		8.1	91.9	0		0	0	0	
PHF	.000	.755	.933	.910	.500	.000	.645	.634	.667	.722	.000	.773	.000	.000	.000	.852



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

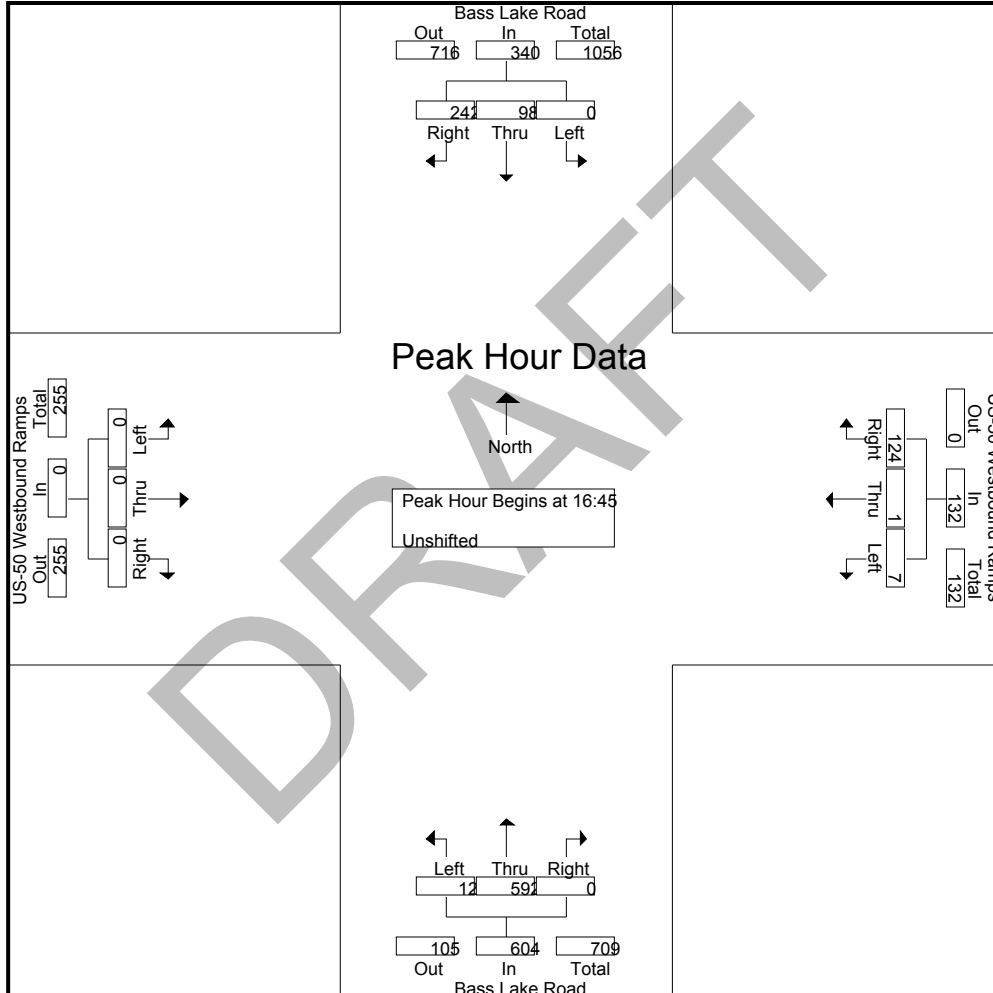
16:45	0	25	58	83	1	0	29	30	2	150	0	152	0	0	0	0	265
17:00	0	27	56	83	3	0	31	34	3	154	0	157	0	0	0	0	274
17:15	0	26	63	89	2	0	41	43	4	145	0	149	0	0	0	0	281
17:30	0	20	65	85	1	1	23	25	3	143	0	146	0	0	0	0	256
Total Volume	0	98	242	340	7	1	124	132	12	592	0	604	0	0	0	0	1076
% App. Total	0	28.8	71.2		5.3	0.8	93.9		2	98	0		0	0	0		
PHF	.000	.907	.931	.955	.583	.250	.756	.767	.750	.961	.000	.962	.000	.000	.000	.000	.957

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-001 Bass Lake-US50 WB Ramps
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-002 Bass Lake-US50 EB Ramps
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					US 50 EB Ramps Westbound					Bass Lake Rd Northbound					US 50 EB Ramps Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	16	0	0	0	16	0	0	0	0	0	0	3	0	0	3	30	0	3	0	33	0	52	52
07:15	34	1	0	0	35	0	0	0	0	0	0	6	4	0	10	30	0	2	0	32	0	77	77
07:30	26	3	0	0	29	0	0	0	0	0	0	6	2	0	8	45	0	0	0	45	0	82	82
07:45	45	4	0	0	49	0	0	0	0	0	0	2	0	0	2	64	0	1	0	65	0	116	116
Total	121	8	0	0	129	0	0	0	0	0	0	17	6	0	23	169	0	6	0	175	0	327	327
08:00	30	1	0	0	31	0	0	0	0	0	0	6	0	0	6	37	0	0	0	37	0	74	74
08:15	31	0	0	0	31	0	0	0	0	0	0	10	1	0	11	40	1	4	2	45	2	87	89
08:30	32	2	0	0	34	0	0	0	0	0	0	5	0	0	5	40	1	0	0	41	0	80	80
08:45	24	1	0	0	25	0	0	0	0	0	0	5	2	0	7	35	0	2	0	37	0	69	69
Total	117	4	0	0	121	0	0	0	0	0	0	26	3	0	29	152	2	6	2	160	2	310	312
16:00	28	1	0	0	29	0	0	0	0	0	0	4	1	0	5	130	0	3	0	133	0	167	167
16:15	18	2	0	0	20	0	0	0	0	0	0	0	1	0	1	144	0	5	0	149	0	170	170
16:30	21	2	0	0	23	0	0	0	0	0	0	3	3	0	6	123	0	6	0	129	0	158	158
16:45	27	2	0	0	29	0	0	0	0	0	0	3	1	0	4	155	0	5	0	160	0	193	193
Total	94	7	0	0	101	0	0	0	0	0	0	10	6	0	16	552	0	19	0	571	0	688	688
17:00	28	4	0	0	32	0	0	0	0	0	0	5	1	0	6	150	2	5	0	157	0	195	195
17:15	25	0	0	0	25	0	0	0	0	0	0	3	1	0	4	149	0	4	0	153	0	182	182
17:30	19	1	0	0	20	0	0	0	0	0	0	1	0	0	1	144	0	4	0	148	0	169	169
17:45	25	0	0	0	25	0	0	0	0	0	0	3	3	0	6	136	0	3	0	139	0	170	170
Total	97	5	0	0	102	0	0	0	0	0	0	12	5	0	17	579	2	16	0	597	0	716	716
Grand Total	429	24	0	0	453	0	0	0	0	0	0	65	20	0	85	1452	4	47	2	1503	2	2041	2043
Apprch %	94.7	5.3	0	0		0	0	0	0	0	0	76.5	23.5	0		96.6	0.3	3.1					
Total %	21	1.2	0	0	22.2	0	0	0	0	0	0	3.2	1	0	4.2	71.1	0.2	2.3		73.6	0.1	99.9	

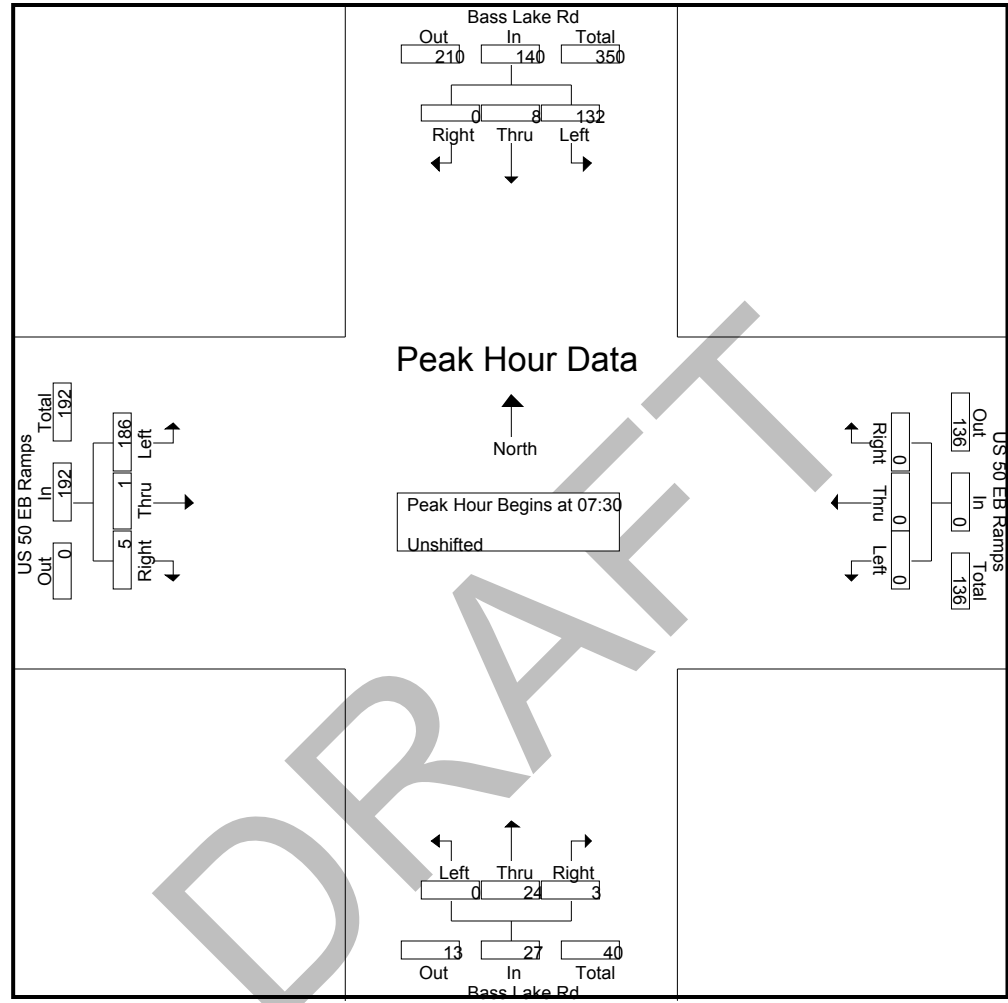
Start Time	Bass Lake Rd Southbound				US 50 EB Ramps Westbound				Bass Lake Rd Northbound				US 50 EB Ramps Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30

07:30	26	3	0	29	0	0	0	0	0	0	6	2	8	45	0	0	45	82
07:45	45	4	0	49	0	0	0	0	0	0	2	0	2	64	0	1	65	116
08:00	30	1	0	31	0	0	0	0	0	0	6	0	6	37	0	0	37	74
08:15	31	0	0	31	0	0	0	0	0	0	10	1	11	40	1	4	45	87
Total Volume	132	8	0	140	0	0	0	0	0	0	24	3	27	186	1	5	192	359

% App. Total	94.3	5.7	0	0	0	0	0	0	88.9	11.1	96.9	0.5	2.6			
PHF	.733	.500	.000	.714	.000	.000	.000	.000	.600	.375	.614	.727	.250	.313	.738	.774



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

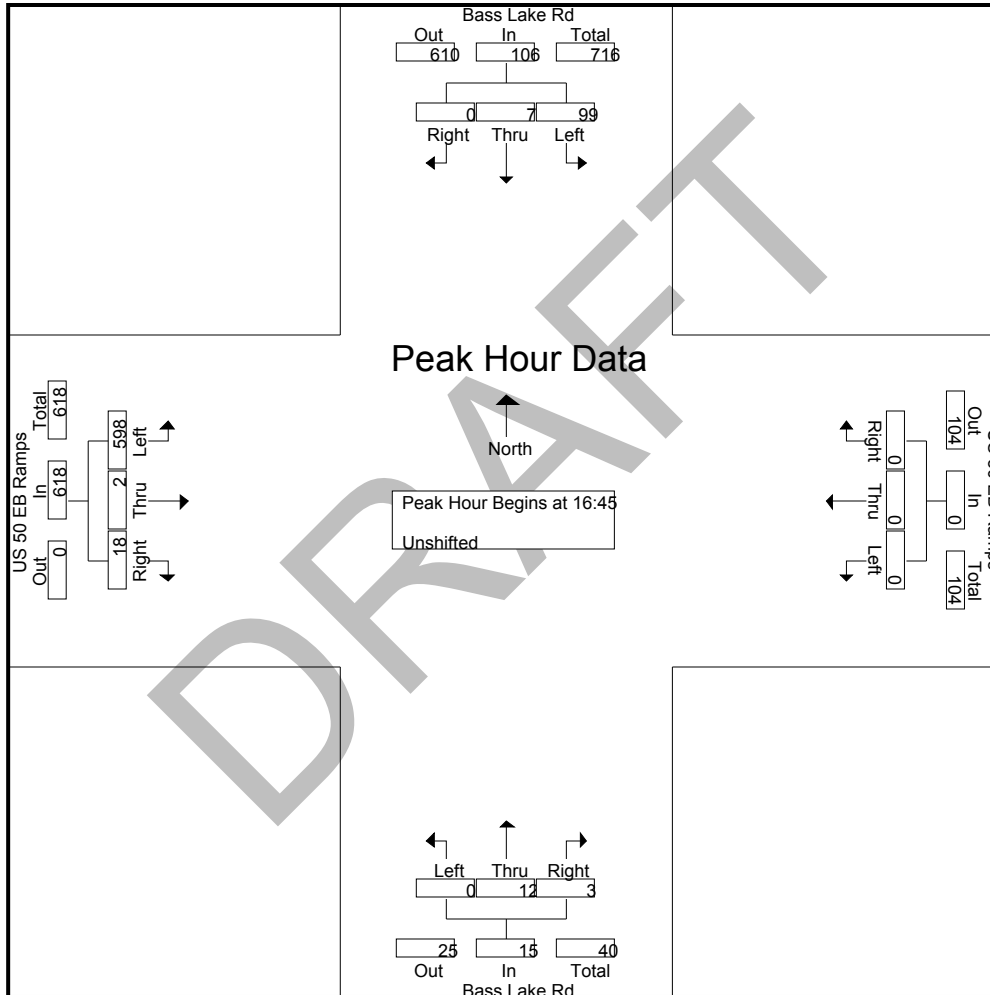
16:45	27	2	0	29	0	0	0	0	0	3	1	4	155	0	5	160	193
17:00	28	4	0	32	0	0	0	0	0	5	1	6	150	2	5	157	195
17:15	25	0	0	25	0	0	0	0	0	3	1	4	149	0	4	153	182
17:30	19	1	0	20	0	0	0	0	0	1	0	1	144	0	4	148	169
Total Volume	99	7	0	106	0	0	0	0	0	12	3	15	598	2	18	618	739
% App. Total	93.4	6.6	0		0	0	0	0	0	80	20		96.8	0.3	2.9		
PHF	.884	.438	.000	.828	.000	.000	.000	.000	.000	.600	.750	.625	.965	.250	.900	.966	.947

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-002 Bass Lake-US50 EB Ramps
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-007 Bass Lake-Marble Mountain
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					Westbound				Bass Lake Rd Northbound					Marble Mountain Rd Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	1	2	0	3	0	0	0	0	0	2	0	0	2	2	0	0	0	2	0	7	7
07:15	0	1	2	0	3	0	0	0	0	0	1	0	0	1	8	0	0	0	8	0	12	12
07:30	0	2	0	0	2	0	0	0	0	0	1	0	0	1	6	0	0	0	6	0	9	9
07:45	0	2	3	0	5	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	7	7
Total	0	6	7	0	13	0	0	0	0	0	4	0	0	4	18	0	0	0	18	0	35	35
08:00	0	1	0	0	1	0	0	0	0	0	2	0	0	2	4	0	0	0	4	0	7	7
08:15	0	0	4	0	4	0	0	0	0	0	5	0	0	5	6	0	0	2	6	2	15	17
08:30	0	2	0	0	2	0	0	0	0	0	2	0	0	2	3	0	0	0	3	0	7	7
08:45	0	1	1	0	2	0	0	0	0	0	3	0	0	3	4	0	1	0	5	0	10	10
Total	0	4	5	0	9	0	0	0	0	0	12	0	0	12	17	0	1	2	18	2	39	41
16:00	0	0	4	0	4	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	9	9
16:15	0	4	3	0	7	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	8	8
16:30	0	1	6	0	7	0	0	0	0	0	3	0	0	3	3	0	0	0	3	0	13	13
16:45	0	3	4	0	7	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	11	11
Total	0	8	17	0	25	0	0	0	0	0	6	0	0	6	10	0	0	0	10	0	41	41
17:00	0	3	6	0	9	0	0	0	0	0	1	0	0	1	5	0	0	0	5	0	15	15
17:15	0	0	5	0	5	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	9	9
17:30	0	1	4	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	6	6
17:45	0	1	2	0	3	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	9	9
Total	0	5	17	0	22	0	0	0	0	0	4	0	0	4	13	0	0	0	13	0	39	39
Grand Total	0	23	46	0	69	0	0	0	0	0	26	0	0	26	58	0	1	2	59	2	154	156
Apprch %	0	33.3	66.7			0	0	0		0	100	0		98.3	0	1.7						
Total %	0	14.9	29.9		44.8	0	0	0		0	16.9	0		16.9	37.7	0	0.6		38.3	1.3	98.7	

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-007 Bass Lake-Marble Mountain
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 2

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Marble Mountain Rd Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	0	1	0	1	0	0	0	0	0	2	0	2	4	0	0	4	7
08:15	0	0	4	4	0	0	0	0	0	5	0	5	6	0	0	6	15
08:30	0	2	0	2	0	0	0	0	0	2	0	2	3	0	0	3	7
08:45	0	1	1	2	0	0	0	0	0	3	0	3	4	0	1	5	10
Total Volume	0	4	5	9	0	0	0	0	0	12	0	12	17	0	1	18	39
% App. Total	0	44.4	55.6		0	0	0		0	100	0		94.4	0	5.6		
PHF	.000	.500	.313	.563	.000	.000	.000	.000	.000	.600	.000	.600	.708	.000	.250	.750	.650

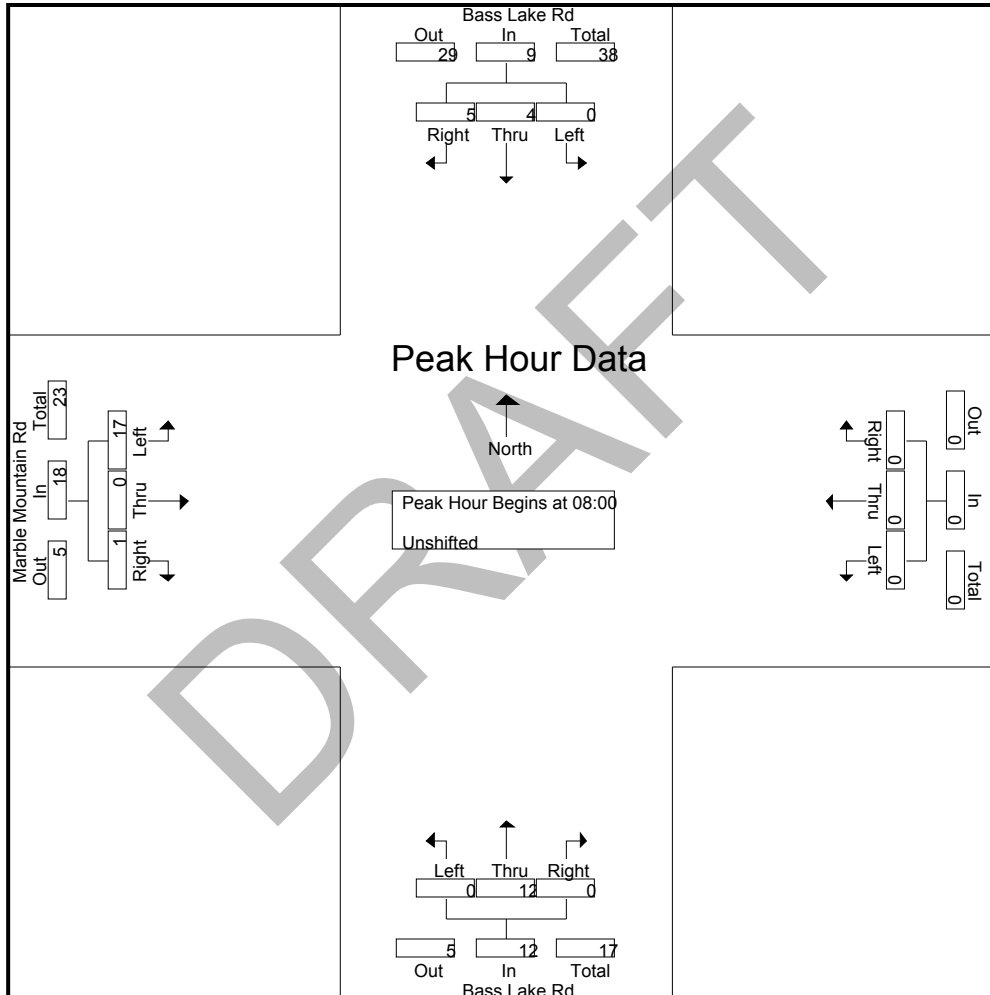
DRAFT

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-007 Bass Lake-Marble Mountain
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-007 Bass Lake-Marble Mountain
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 4

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Marble Mountain Rd Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	0	1	6	7	0	0	0	0	0	3	0	3	3	0	0	3	13
16:45	0	3	4	7	0	0	0	0	0	3	0	3	1	0	0	1	11
17:00	0	3	6	9	0	0	0	0	0	1	0	1	5	0	0	5	15
17:15	0	0	5	5	0	0	0	0	0	3	0	3	1	0	0	1	9
Total Volume	0	7	21	28	0	0	0	0	0	10	0	10	10	0	0	10	48
% App. Total	0	25	75		0	0	0		0	100	0		100	0	0		
PHF	.000	.583	.875	.778	.000	.000	.000	.000	.000	.833	.000	.833	.500	.000	.000	.500	.800

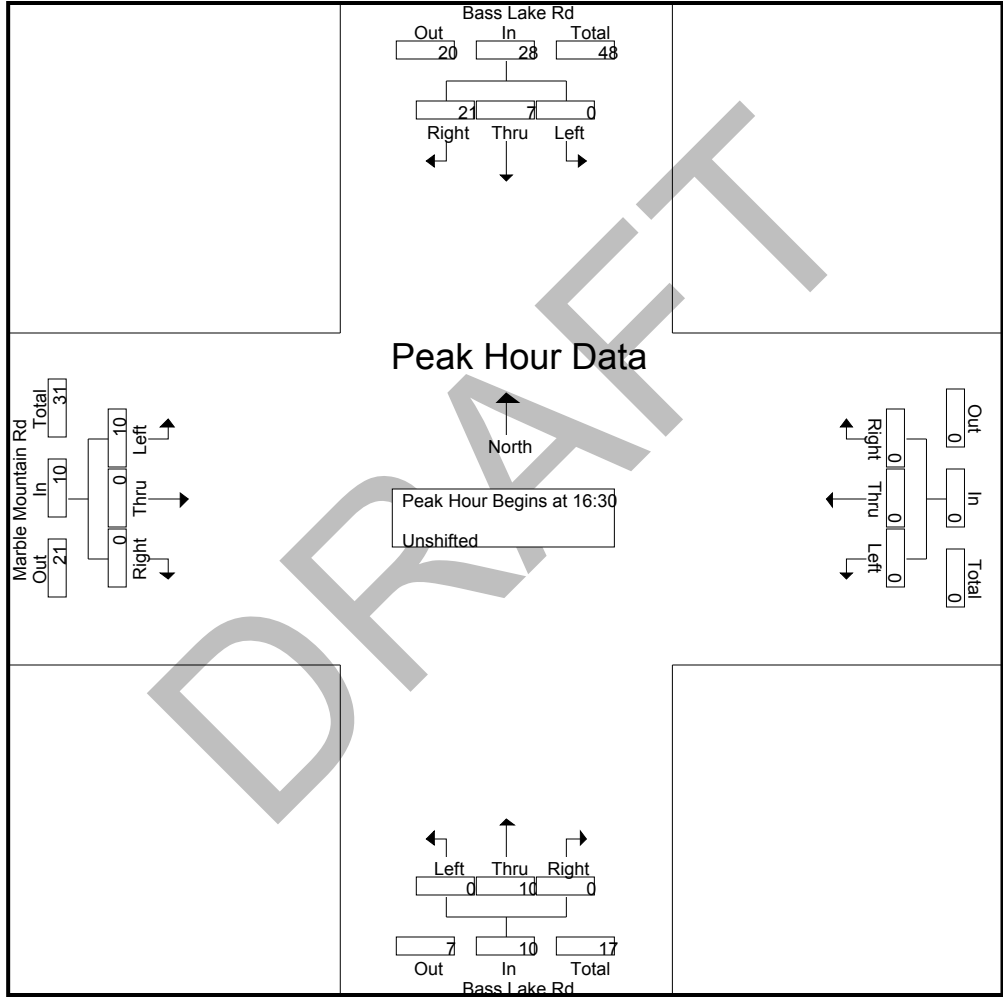
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All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-007 Bass Lake-Marble Mountain
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 5



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-008 Marble Ridge-Bass Lake
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Bass Lake Rd Southbound					Westbound				Bass Lake Rd Northbound					Marble Ridge Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	3	3
07:15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2
07:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2
07:45	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Total	0	3	3	0	6	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	10	10
08:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	3	3
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	5	5
08:30	0	0	2	0	2	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	4	4
08:45	0	1	1	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	5	5
Total	0	1	4	0	5	0	0	0	0	0	1	0	0	1	11	0	0	0	11	0	17	17
16:15	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
16:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	5	5
16:45	0	0	3	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	6	6
Total	0	0	8	0	8	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	14	14
17:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3	3
17:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	4	4
17:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
17:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	5	0	5	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	9	9
Grand Total	0	4	20	0	24	0	0	0	0	0	1	0	0	1	25	0	0	0	25	0	50	50
Aprch %	0	16.7	83.3			0	0	0		0	100	0		100	0	0						
Total %	0	8	40		48	0	0	0		0	2	0		2	50	0	0		50	0	100	

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-008 Marble Ridge-Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 2

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Marble Ridge Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	0	0	1	1	0	0	0	0	0	0	0	0	2	0	0	2	3
08:15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5
08:30	0	0	2	2	0	0	0	0	0	1	0	1	1	0	0	1	4
08:45	0	1	1	2	0	0	0	0	0	0	0	0	3	0	0	3	5
Total Volume	0	1	4	5	0	0	0	0	0	1	0	1	11	0	0	11	17
% App. Total	0	20	80		0	0	0		0	100	0		100	0	0		
PHF	.000	.250	.500	.625	.000	.000	.000	.000	.000	.250	.000	.250	.550	.000	.000	.550	.850

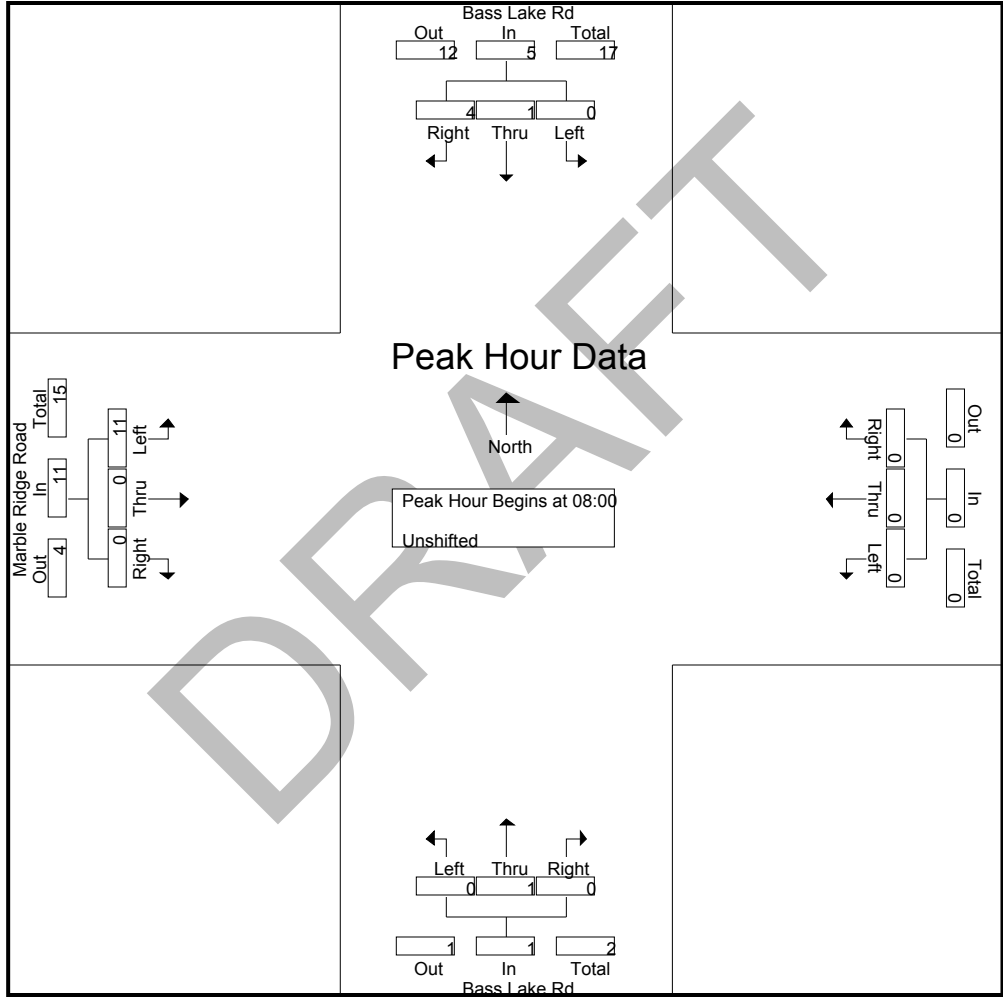
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All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-008 Marble Ridge-Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-008 Marble Ridge-Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 4

Start Time	Bass Lake Rd Southbound				Westbound				Bass Lake Rd Northbound				Marble Ridge Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	0	0	2	2	0	0	0	0	0	0	0	0	3	0	0	3	5
16:45	0	0	3	3	0	0	0	0	0	0	0	0	3	0	0	3	6
17:00	0	0	2	2	0	0	0	0	0	0	0	0	1	0	0	1	3
17:15	0	0	1	1	0	0	0	0	0	0	0	0	3	0	0	3	4
Total Volume	0	0	8	8	0	0	0	0	0	0	0	0	10	0	0	10	18
% App. Total	0	0	100		0	0	0		0	0	0		100	0	0		
PHF	.000	.000	.667	.667	.000	.000	.000	.000	.000	.000	.000	.000	.833	.000	.000	.833	.750

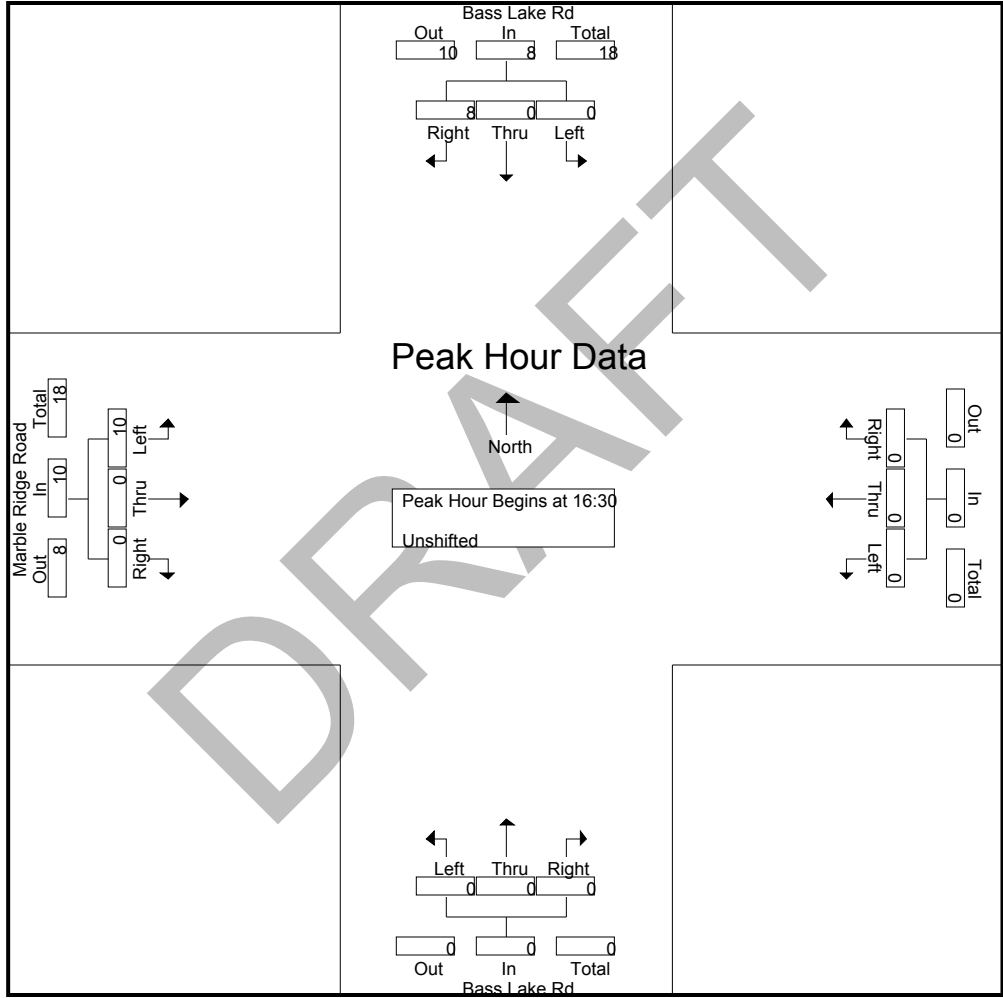
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All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-008 Marble Ridge-Bass Lake
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 5



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-014 Cambridge-Country Club
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

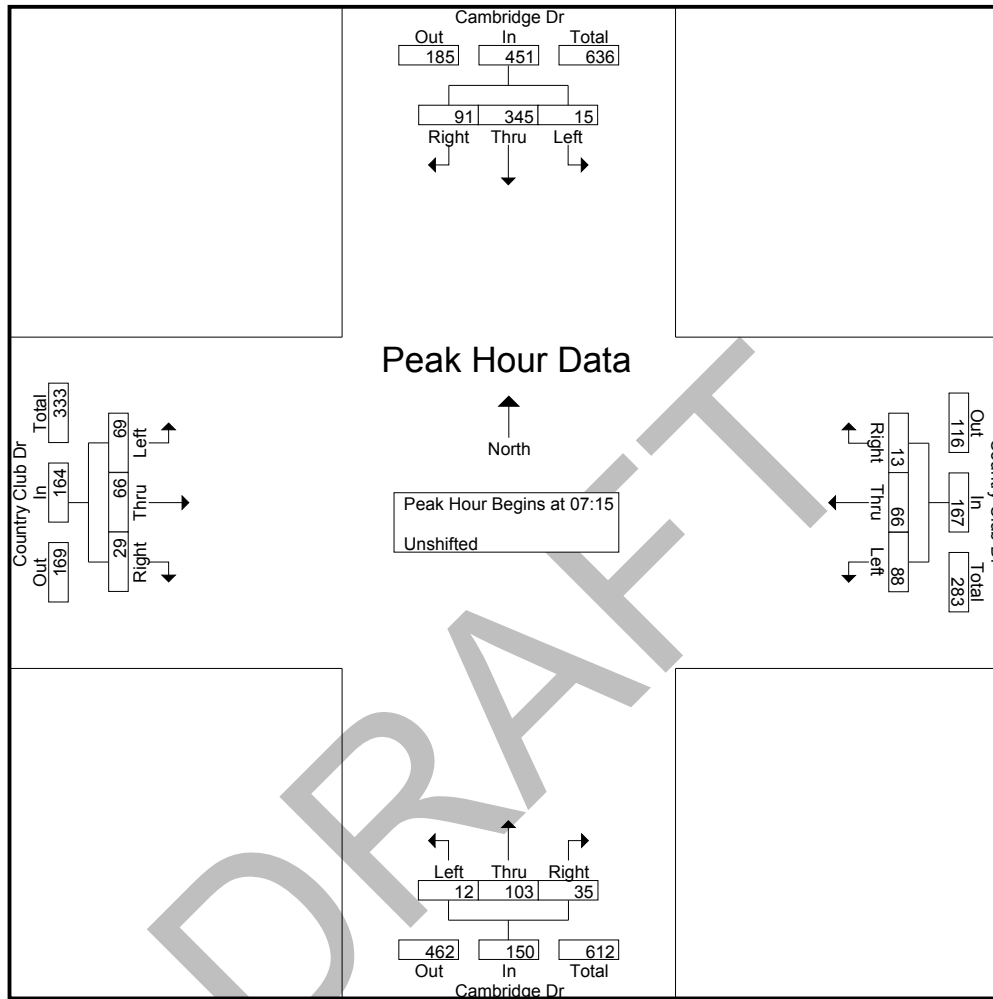
Groups Printed- Unshifted

Start Time	Cambridge Dr Southbound					Country Club Dr Westbound					Cambridge Dr Northbound					Country Club Dr Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	5	72	7	0	84	20	4	3	0	27	3	20	9	0	32	3	3	2	0	8	0	151	151
07:15	3	86	13	1	102	19	7	7	0	33	1	17	9	0	27	5	6	6	1	17	2	179	181
07:30	7	97	32	0	136	35	34	3	0	72	4	22	11	0	37	18	20	12	0	50	0	295	295
07:45	1	84	33	0	118	18	14	1	0	33	4	37	7	0	48	34	32	7	0	73	0	272	272
Total	16	339	85	1	440	92	59	14	0	165	12	96	36	0	144	60	61	27	1	148	2	897	899
08:00	4	78	13	0	95	16	11	2	0	29	3	27	8	0	38	12	8	4	0	24	0	186	186
08:15	5	63	6	0	74	12	6	4	0	22	1	31	7	0	39	4	2	3	0	9	0	144	144
08:30	1	71	9	0	81	9	3	0	0	12	1	17	10	0	28	5	3	2	0	10	0	131	131
08:45	6	68	9	0	83	9	11	7	0	27	3	28	4	1	35	12	7	2	0	21	1	166	167
Total	16	280	37	0	333	46	31	13	0	90	8	103	29	1	140	33	20	11	0	64	1	627	628
16:00	10	56	14	0	80	15	9	13	0	37	7	82	25	0	114	6	24	6	0	36	0	267	267
16:15	8	55	15	0	78	19	14	3	0	36	2	79	22	0	103	13	15	2	0	30	0	247	247
16:30	5	56	14	0	75	12	12	8	0	32	5	83	27	0	115	13	11	3	0	27	0	249	249
16:45	6	52	12	0	70	11	20	6	0	37	5	92	19	0	116	9	10	4	0	23	0	246	246
Total	29	219	55	0	303	57	55	30	0	142	19	336	93	0	448	41	60	15	0	116	0	1009	1009
17:00	7	53	19	0	79	11	17	7	0	35	4	87	23	0	114	12	9	6	0	27	0	255	255
17:15	8	50	17	0	75	3	13	4	0	20	3	90	30	1	123	16	8	6	0	30	1	248	249
17:30	5	59	24	0	88	12	16	13	0	41	1	94	17	0	112	19	13	2	0	34	0	275	275
17:45	4	46	18	0	68	11	23	9	0	43	9	89	27	0	125	14	7	5	0	26	0	262	262
Total	24	208	78	0	310	37	69	33	0	139	17	360	97	1	474	61	37	19	0	117	1	1040	1041
Grand Total	85	1046	255	1	1386	232	214	90	0	536	56	895	255	2	1206	195	178	72	1	445	4	3573	3577
Apprch %	6.1	75.5	18.4			43.3	39.9	16.8			4.6	74.2	21.1			43.8	40	16.2					
Total %	2.4	29.3	7.1		38.8	6.5	6	2.5		15	1.6	25	7.1		33.8	5.5	5	2		12.5	0.1	99.9	

Start Time	Cambridge Dr Southbound				Country Club Dr Westbound				Cambridge Dr Northbound				Country Club Dr Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:15	3	86	13	102	19	7	7	33	1	17	9	27	5	6	6	17	179
07:30	7	97	32	136	35	34	3	72	4	22	11	37	18	20	12	50	295
07:45	1	84	33	118	18	14	1	33	4	37	7	48	34	32	7	73	272
08:00	4	78	13	95	16	11	2	29	3	27	8	38	12	8	4	24	186
Total Volume	15	345	91	451	88	66	13	167	12	103	35	150	69	66	29	164	932
% App. Total	3.3	76.5	20.2		52.7	39.5	7.8		8	68.7	23.3		42.1	40.2	17.7		

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 17:00

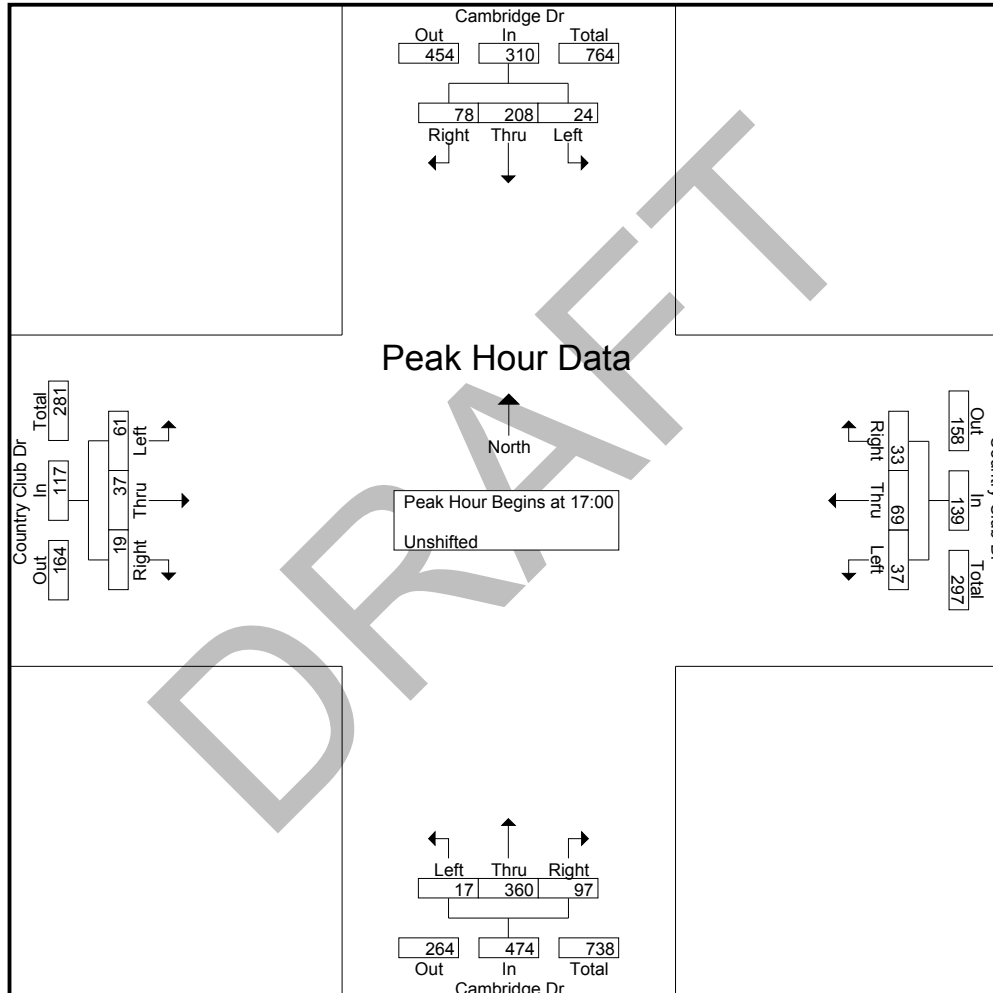
17:00	7	53	19	79	11	17	7	35	4	87	23	114	12	9	6	27	255
17:15	8	50	17	75	3	13	4	20	3	90	30	123	16	8	6	30	248
17:30	5	59	24	88	12	16	13	41	1	94	17	112	19	13	2	34	275
17:45	4	46	18	68	11	23	9	43	9	89	27	125	14	7	5	26	262
Total Volume	24	208	78	310	37	69	33	139	17	360	97	474	61	37	19	117	1040
% App. Total	7.7	67.1	25.2		26.6	49.6	23.7		3.6	75.9	20.5		52.1	31.6	16.2		
PHF	.750	.881	.813	.881	.771	.750	.635	.808	.472	.957	.808	.948	.803	.712	.792	.860	.945

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-014 Cambridge-Country Club
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-013 Cambridge-Knollwood
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

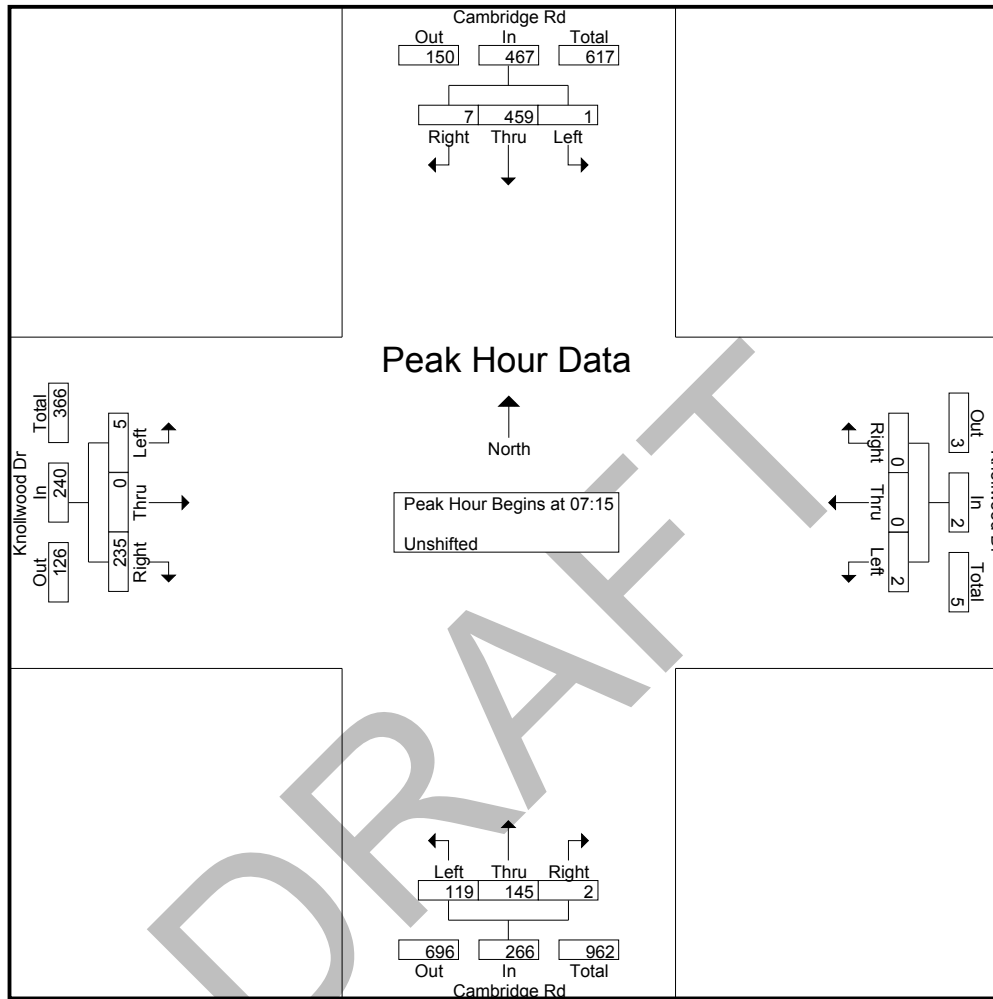
Groups Printed- Unshifted

Start Time	Cambridge Rd Southbound					Knollwood Dr Westbound					Cambridge Rd Northbound					Knollwood Dr Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	92	0	0	92	0	0	0	0	0	15	31	1	0	47	0	0	37	0	37	0	176	176
07:15	0	115	1	0	116	1	0	0	0	1	14	26	0	0	40	0	0	35	0	35	0	192	192
07:30	0	139	1	0	140	0	0	0	0	0	48	33	1	0	82	4	0	71	0	75	0	297	297
07:45	1	109	4	0	114	1	0	0	0	1	30	52	0	0	82	0	0	75	0	75	0	272	272
Total	1	455	6	0	462	2	0	0	0	2	107	142	2	0	251	4	0	218	0	222	0	937	937
08:00	0	96	1	0	97	0	0	0	0	0	27	34	1	0	62	1	0	54	1	55	1	214	215
08:15	0	79	0	0	79	0	1	0	1	1	15	36	1	0	52	1	0	37	0	38	1	170	171
08:30	0	81	1	0	82	0	0	0	0	0	22	28	0	0	50	0	0	42	0	42	0	174	174
08:45	1	68	3	0	72	0	0	0	0	0	17	34	1	0	52	0	1	25	0	26	0	150	150
Total	1	324	5	0	330	0	1	0	1	1	81	132	3	0	216	2	1	158	1	161	2	708	710
16:00	0	73	5	0	78	1	0	2	0	3	40	109	0	0	149	3	0	26	0	29	0	259	259
16:15	0	74	2	0	76	0	0	1	0	1	38	106	1	0	145	3	0	21	0	24	0	246	246
16:30	1	70	2	0	73	0	0	2	0	2	39	102	0	0	141	5	0	26	0	31	0	247	247
16:45	0	63	3	0	66	0	0	3	0	3	42	113	1	0	156	2	1	24	0	27	0	252	252
Total	1	280	12	0	293	1	0	8	0	9	159	430	2	0	591	13	1	97	0	111	0	1004	1004
17:00	0	69	1	0	70	2	0	1	0	3	41	114	0	0	155	1	0	34	0	35	0	263	263
17:15	2	56	1	0	59	0	1	1	0	2	62	120	0	0	182	2	0	29	0	31	0	274	274
17:30	0	68	4	1	72	2	1	0	0	3	45	112	0	0	157	2	0	29	1	31	2	263	265
17:45	0	57	3	0	60	0	1	0	0	1	45	116	0	0	161	2	0	30	0	32	0	254	254
Total	2	250	9	1	261	4	3	2	0	9	193	462	0	0	655	7	0	122	1	129	2	1054	1056
Grand Total	5	1309	32	1	1346	7	4	10	1	21	540	1166	7	0	1713	26	2	595	2	623	4	3703	3707
Apprch %	0.4	97.3	2.4			33.3	19	47.6			31.5	68.1	0.4			4.2	0.3	95.5					
Total %	0.1	35.3	0.9		36.3	0.2	0.1	0.3		0.6	14.6	31.5	0.2		46.3	0.7	0.1	16.1		16.8	0.1	99.9	

Start Time	Cambridge Rd Southbound				Knollwood Dr Westbound				Cambridge Rd Northbound				Knollwood Dr Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:15	0	115	1	116	1	0	0	1	14	26	0	40	0	0	35	35	192
07:30	0	139	1	140	0	0	0	0	48	33	1	82	4	0	71	75	297
07:45	1	109	4	114	1	0	0	1	30	52	0	82	0	0	75	75	272
08:00	0	96	1	97	0	0	0	0	27	34	1	62	1	0	54	55	214
Total Volume	1	459	7	467	2	0	0	2	119	145	2	266	5	0	235	240	975
% App. Total	0.2	98.3	1.5		100	0	0		44.7	54.5	0.8		2.1	0	97.9		

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 17:00

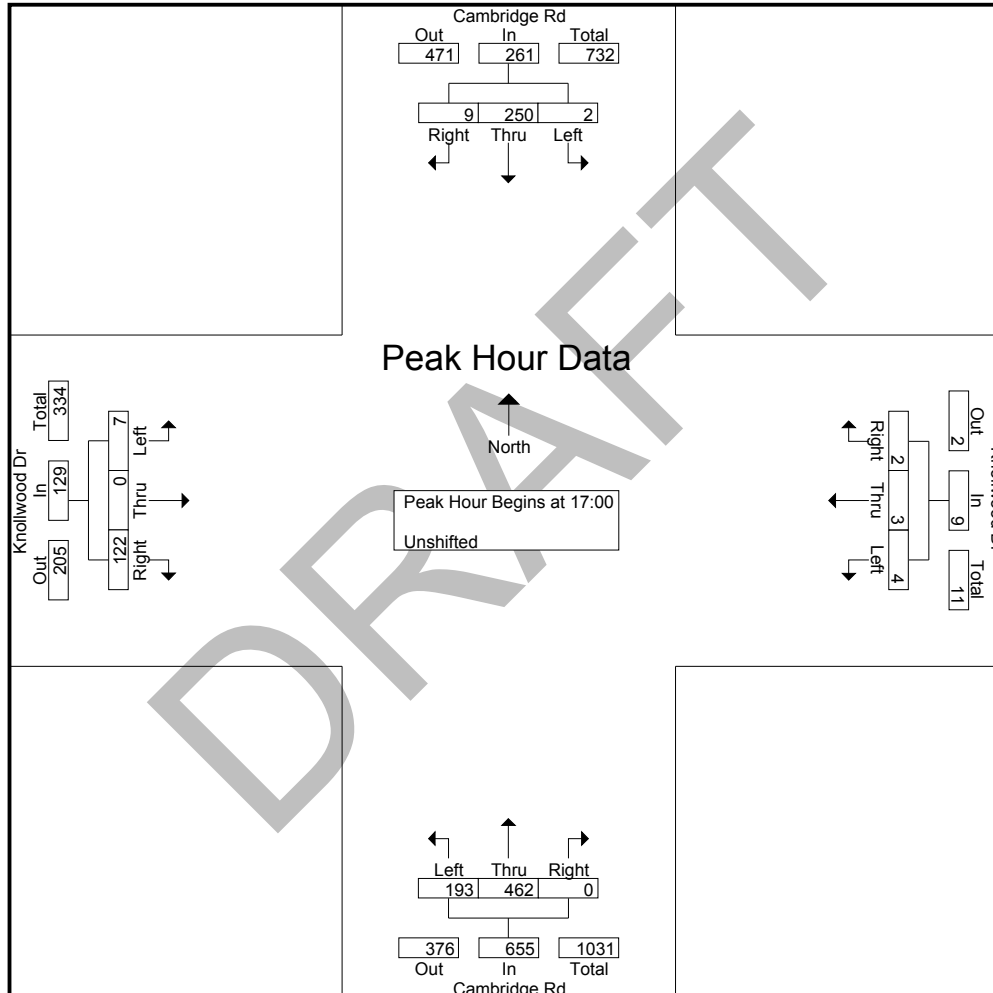
17:00	0	69	1	70	2	0	1	3	41	114	0	155	1	0	34	35	263
17:15	2	56	1	59	0	1	1	2	62	120	0	182	2	0	29	31	274
17:30	0	68	4	72	2	1	0	3	45	112	0	157	2	0	29	31	263
17:45	0	57	3	60	0	1	0	1	45	116	0	161	2	0	30	32	254
Total Volume	2	250	9	261	4	3	2	9	193	462	0	655	7	0	122	129	1054
% App. Total	0.8	95.8	3.4		44.4	33.3	22.2		29.5	70.5	0		5.4	0	94.6		
PHF	.250	.906	.563	.906	.500	.750	.500	.750	.778	.963	.000	.900	.875	.000	.897	.921	.962

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-013 Cambridge-Knollwood
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-012 Cambridge-US50 WB Ramps
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

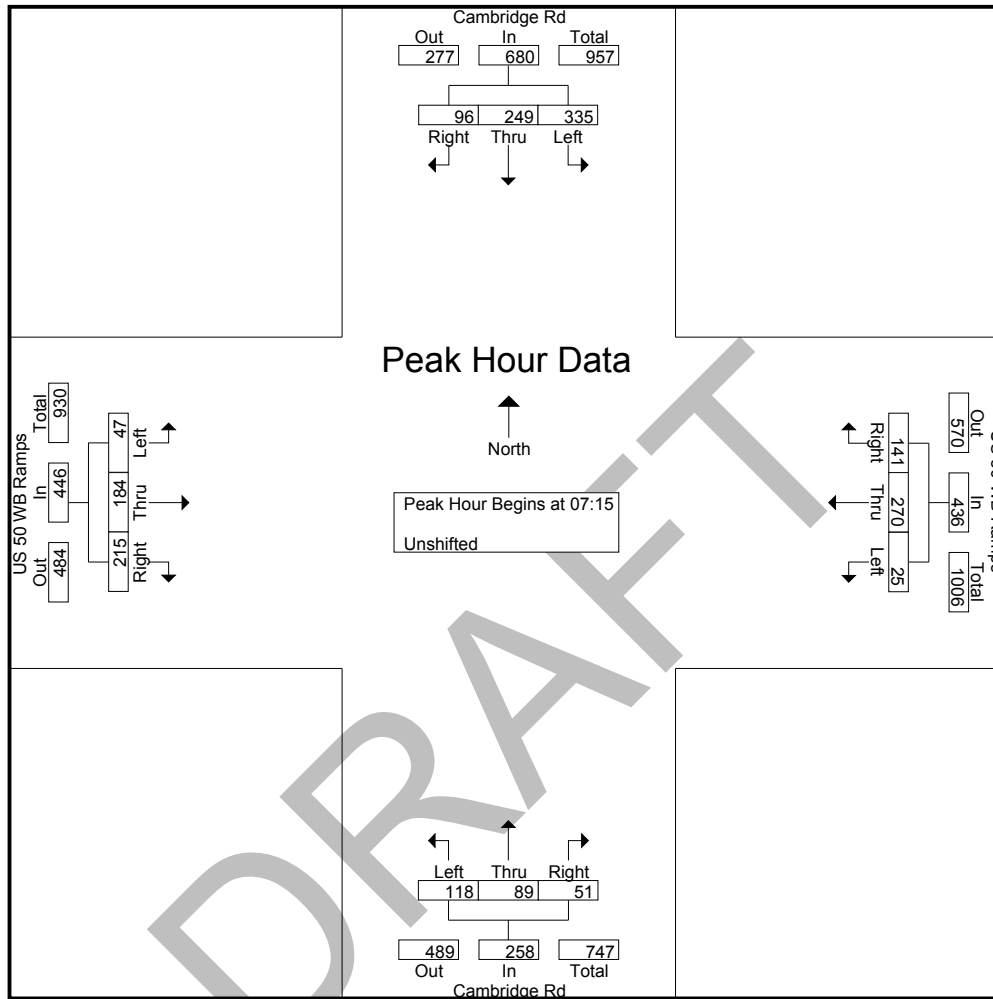
Groups Printed- Unshifted

Start Time	Cambridge Rd Southbound					US 50 WB Ramps Westbound					Cambridge Rd Northbound					US 50 WB Ramps Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	83	40	10	0	133	6	38	29	0	73	7	20	21	0	48	3	32	10	0	45	0	299	299
07:15	79	51	16	0	146	5	74	15	0	94	32	19	10	0	61	6	43	31	0	80	0	381	381
07:30	83	71	55	0	209	3	114	48	0	165	47	27	17	0	91	16	41	81	0	138	0	603	603
07:45	93	70	15	0	178	9	39	38	0	86	30	25	12	0	67	17	70	67	0	154	0	485	485
Total	338	232	96	0	666	23	265	130	0	418	116	91	60	0	267	42	186	189	0	417	0	1768	1768
08:00	80	57	10	0	147	8	43	40	0	91	9	18	12	0	39	8	30	36	0	74	0	351	351
08:15	54	57	13	1	124	3	28	20	0	51	10	21	11	0	42	13	36	20	0	69	1	286	287
08:30	63	46	10	0	119	4	21	30	0	55	9	12	11	0	32	7	21	14	0	42	0	248	248
08:45	65	29	9	0	103	14	39	29	0	82	19	20	13	0	52	4	26	20	0	50	0	287	287
Total	262	189	42	1	493	29	131	119	0	279	47	71	47	0	165	32	113	90	0	235	1	1172	1173
16:00	32	50	13	0	95	5	26	55	0	86	32	85	11	0	128	16	14	42	0	72	0	381	381
16:15	38	48	10	0	96	9	41	40	0	90	30	81	6	0	117	15	15	32	0	62	0	365	365
16:30	44	43	13	0	100	14	36	35	0	85	39	87	8	0	134	6	15	43	0	64	0	383	383
16:45	28	31	25	0	84	17	51	54	0	122	51	75	7	0	133	13	17	36	0	66	0	405	405
Total	142	172	61	0	375	45	154	184	0	383	152	328	32	0	512	50	61	153	0	264	0	1534	1534
17:00	33	47	20	0	100	8	53	42	1	103	24	92	12	0	128	15	18	39	0	72	1	403	404
17:15	23	50	15	0	88	7	52	67	0	126	43	84	6	0	133	23	22	43	0	88	0	435	435
17:30	44	37	10	0	91	11	54	48	0	113	48	93	9	0	150	11	16	43	0	70	0	424	424
17:45	29	34	19	0	82	13	46	47	0	106	36	93	6	0	135	15	20	46	0	81	0	404	404
Total	129	168	64	0	361	39	205	204	1	448	151	362	33	0	546	64	76	171	0	311	1	1666	1667
Grand Total	871	761	263	1	1895	136	755	637	1	1528	466	852	172	0	1490	188	436	603	0	1227	2	6140	6142
Apprch %	46	40.2	13.9			8.9	49.4	41.7			31.3	57.2	11.5			15.3	35.5	49.1					
Total %	14.2	12.4	4.3		30.9	2.2	12.3	10.4		24.9	7.6	13.9	2.8		24.3	3.1	7.1	9.8		20	0	100	

Start Time	Cambridge Rd Southbound				US 50 WB Ramps Westbound				Cambridge Rd Northbound				US 50 WB Ramps Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:15	79	51	16	146	5	74	15	94	32	19	10	61	6	43	31	80	381
07:30	83	71	55	209	3	114	48	165	47	27	17	91	16	41	81	138	603
07:45	93	70	15	178	9	39	38	86	30	25	12	67	17	70	67	154	485
08:00	80	57	10	147	8	43	40	91	9	18	12	39	8	30	36	74	351
Total Volume	335	249	96	680	25	270	141	436	118	89	51	258	47	184	215	446	1820
% App. Total	49.3	36.6	14.1		5.7	61.9	32.3		45.7	34.5	19.8		10.5	41.3	48.2		

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

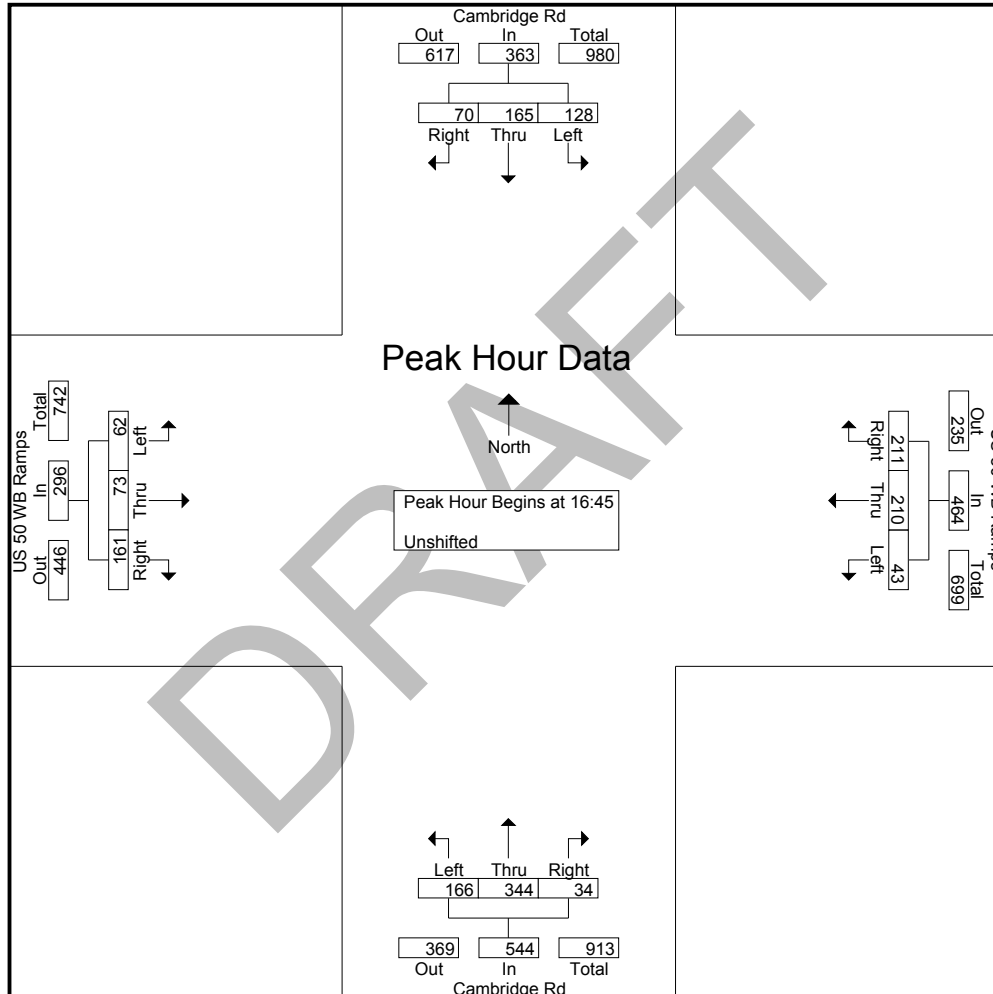
16:45	28	31	25	84	17	51	54	122	51	75	7	133	13	17	36	66	405
17:00	33	47	20	100	8	53	42	103	24	92	12	128	15	18	39	72	403
17:15	23	50	15	88	7	52	67	126	43	84	6	133	23	22	43	88	435
17:30	44	37	10	91	11	54	48	113	48	93	9	150	11	16	43	70	424
Total Volume	128	165	70	363	43	210	211	464	166	344	34	544	62	73	161	296	1667
% App. Total	35.3	45.5	19.3		9.3	45.3	45.5		30.5	63.2	6.2		20.9	24.7	54.4		
PHF	.727	.825	.700	.908	.632	.972	.787	.921	.814	.925	.708	.907	.674	.830	.936	.841	.958

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-012 Cambridge-US50 WB Ramps
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-011 Cambridge-US50 EB Ramps
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

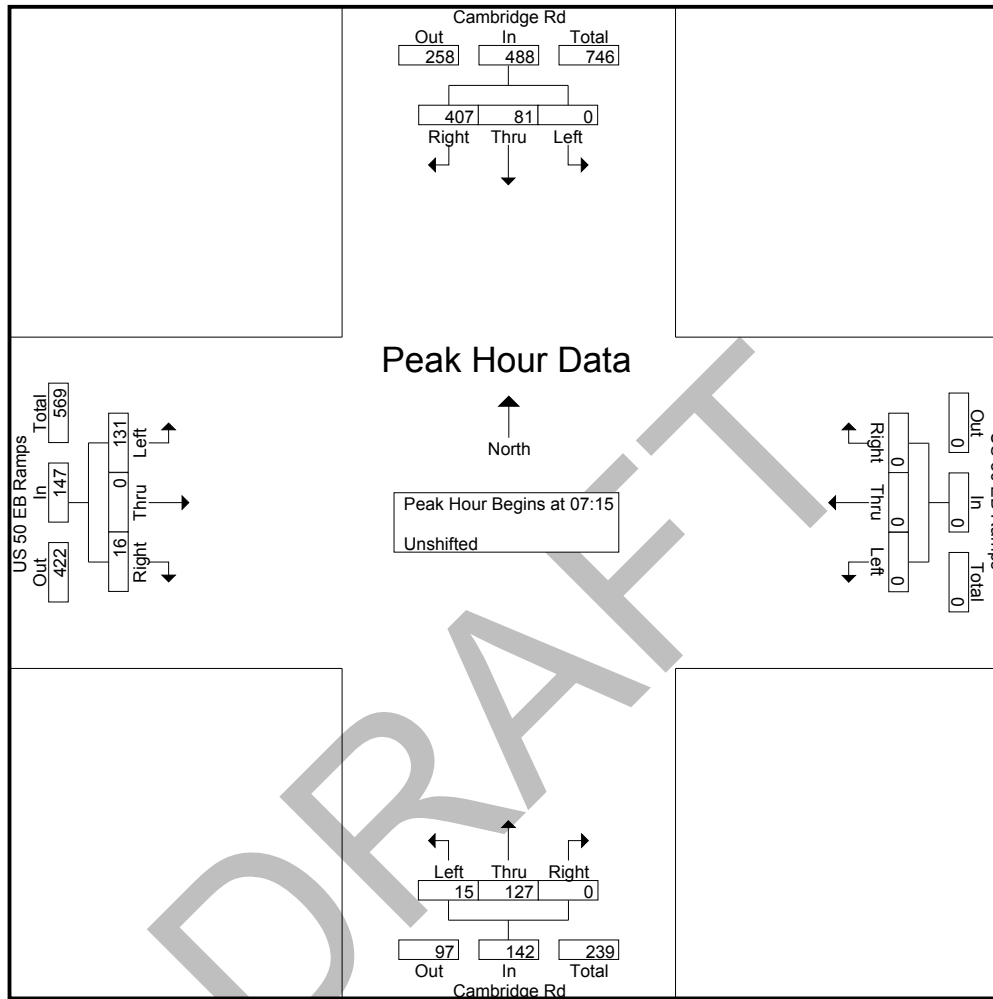
Groups Printed- Unshifted

Start Time	Cambridge Rd Southbound					US 50 EB Ramps Westbound					Cambridge Rd Northbound					US 50 EB Ramps Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	7	48	0	55	0	0	0	0	0	13	31	0	0	44	20	0	1	0	21	0	120	120
07:15	0	10	73	0	83	0	0	0	0	0	2	24	0	0	26	37	0	3	0	40	0	149	149
07:30	0	18	140	0	158	0	0	0	0	0	5	55	0	0	60	40	0	4	0	44	0	262	262
07:45	0	30	117	0	147	0	0	0	0	0	5	30	0	0	35	33	0	4	0	37	0	219	219
Total	0	65	378	0	443	0	0	0	0	0	25	140	0	0	165	130	0	12	0	142	0	750	750
08:00	0	23	77	0	100	0	0	0	0	0	3	18	0	0	21	21	0	5	0	26	0	147	147
08:15	0	9	64	0	73	0	0	0	0	0	9	19	0	0	28	24	0	2	0	26	0	127	127
08:30	0	9	61	0	70	0	0	0	0	0	6	11	0	0	17	22	0	4	0	26	0	113	113
08:45	0	13	48	0	61	0	0	0	0	0	4	21	0	0	25	32	0	7	0	39	0	125	125
Total	0	54	250	0	304	0	0	0	0	0	22	69	0	0	91	99	0	18	0	117	0	512	512
16:00	0	27	67	0	94	0	0	0	0	0	9	32	0	0	41	98	0	20	0	118	0	253	253
16:15	0	16	77	0	93	0	0	0	0	0	8	13	0	0	21	108	0	19	0	127	0	241	241
16:30	0	27	71	0	98	0	0	0	0	0	8	17	0	0	25	113	0	17	0	130	0	253	253
16:45	0	27	58	0	85	0	0	0	0	0	13	20	0	0	33	112	1	21	0	134	0	252	252
Total	0	97	273	0	370	0	0	0	0	0	38	82	0	0	120	431	1	77	0	509	0	999	999
17:00	0	21	70	0	91	0	0	0	0	0	10	33	0	0	43	100	0	21	0	121	0	255	255
17:15	0	31	70	0	101	0	0	0	0	0	10	18	0	0	28	107	0	15	1	122	1	251	252
17:30	0	19	70	0	89	0	0	0	0	0	9	28	0	0	37	125	0	19	0	144	0	270	270
17:45	0	19	73	0	92	0	0	0	0	0	6	24	0	0	30	113	0	23	0	136	0	258	258
Total	0	90	283	0	373	0	0	0	0	0	35	103	0	0	138	445	0	78	1	523	1	1034	1035
Grand Total	0	306	1184	0	1490	0	0	0	0	0	120	394	0	0	514	1105	1	185	1	1291	1	3295	3296
Apprch %	0	20.5	79.5			0	0	0			23.3	76.7	0			85.6	0.1	14.3					
Total %	0	9.3	35.9		45.2	0	0	0			3.6	12	0		15.6	33.5	0	5.6		39.2	0	100	

Start Time	Cambridge Rd Southbound				US 50 EB Ramps Westbound				Cambridge Rd Northbound				US 50 EB Ramps Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:15	0	10	73	83	0	0	0	0	2	24	0	26	37	0	3	40	149
07:30	0	18	140	158	0	0	0	0	5	55	0	60	40	0	4	44	262
07:45	0	30	117	147	0	0	0	0	5	30	0	35	33	0	4	37	219
08:00	0	23	77	100	0	0	0	0	3	18	0	21	21	0	5	26	147
Total Volume	0	81	407	488	0	0	0	0	15	127	0	142	131	0	16	147	777
% App. Total	0	16.6	83.4		0	0	0		10.6	89.4	0		89.1	0	10.9		

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

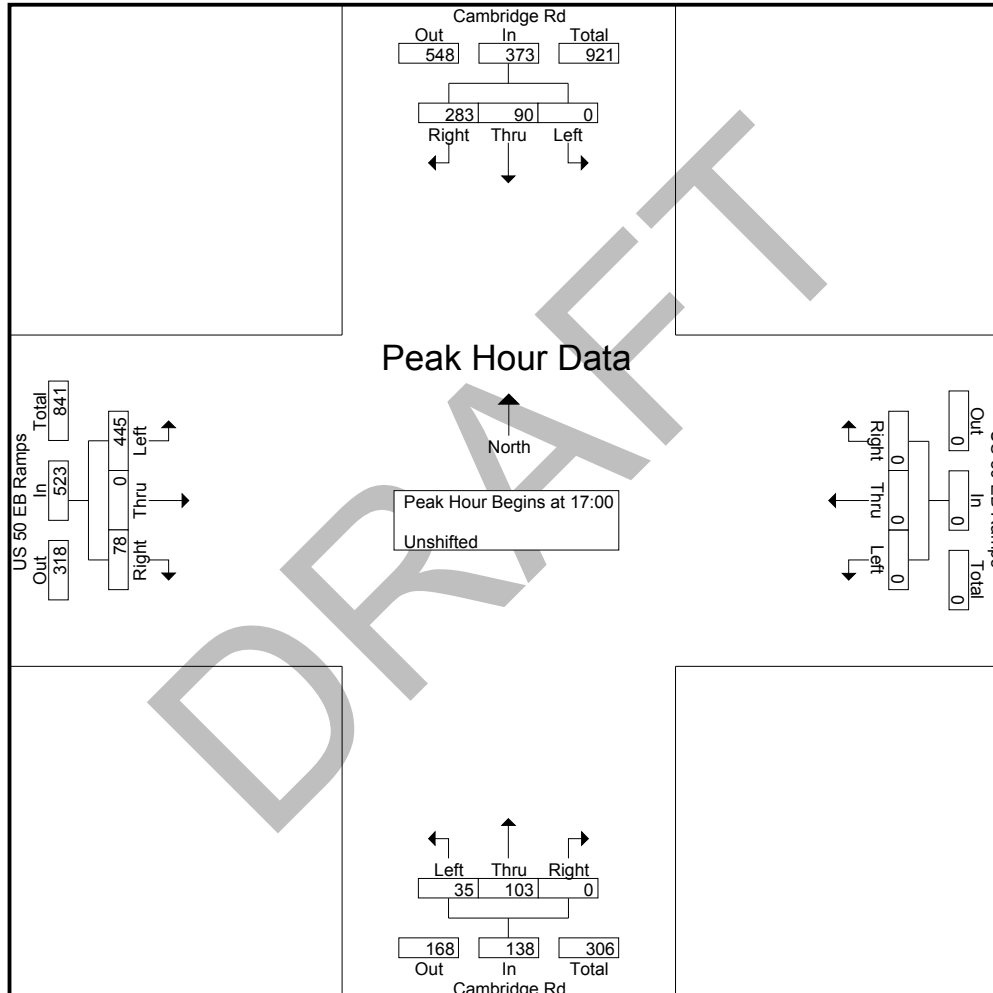
17:00	0	21	70	91	0	0	0	0	10	33	0	43	100	0	21	121	255
17:15	0	31	70	101	0	0	0	0	10	18	0	28	107	0	15	122	251
17:30	0	19	70	89	0	0	0	0	9	28	0	37	125	0	19	144	270
17:45	0	19	73	92	0	0	0	0	6	24	0	30	113	0	23	136	258
Total Volume	0	90	283	373	0	0	0	0	35	103	0	138	445	0	78	523	1034
% App. Total	0	24.1	75.9		0	0	0		25.4	74.6	0		85.1	0	14.9		
PHF	.000	.726	.969	.923	.000	.000	.000	.000	.875	.780	.000	.802	.890	.000	.848	.908	.957

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-011 Cambridge-US50 EB Ramps
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-010 Flying C-Crazy Horse
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

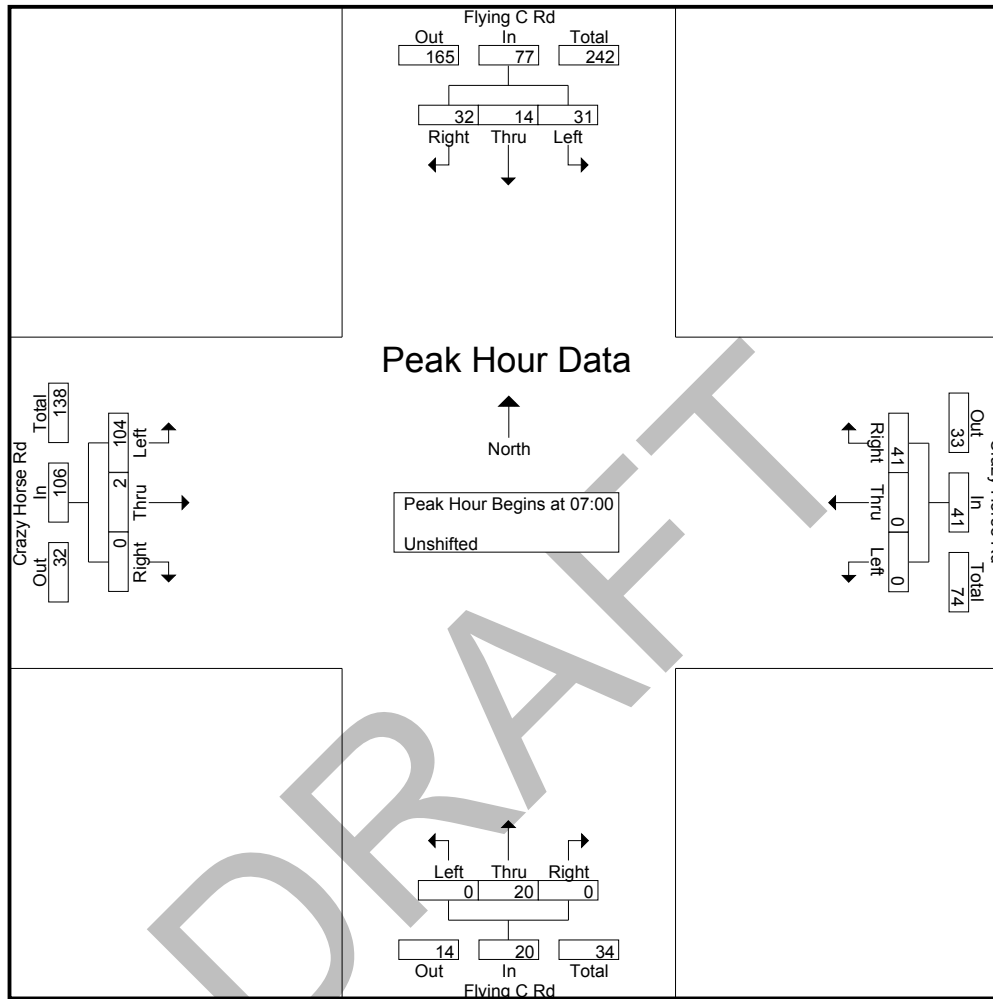
Groups Printed- Unshifted

Start Time	Flying C Rd Southbound					Crazy Horse Rd Westbound					Flying C Rd Northbound					Crazy Horse Rd Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	2	1	5	0	8	0	0	7	0	7	0	5	0	0	5	32	0	0	0	32	0	52	52
07:15	4	5	4	0	13	0	0	7	0	7	0	0	0	0	0	20	0	0	0	20	0	40	40
07:30	12	2	7	0	21	0	0	17	0	17	0	11	0	0	11	31	1	0	0	32	0	81	81
07:45	13	6	16	0	35	0	0	10	0	10	0	4	0	0	4	21	1	0	0	22	0	71	71
Total	31	14	32	0	77	0	0	41	0	41	0	20	0	0	20	104	2	0	0	106	0	244	244
08:00	12	2	13	0	27	0	0	9	0	9	0	2	0	0	2	12	0	0	0	12	0	50	50
08:15	6	3	3	0	12	0	0	9	0	9	0	2	0	0	2	15	0	0	0	15	0	38	38
08:30	10	0	3	0	13	0	0	8	0	8	0	2	0	0	2	7	0	0	0	7	0	30	30
08:45	13	0	7	0	20	0	0	10	0	10	0	4	0	0	4	11	0	0	0	11	0	45	45
Total	41	5	26	0	72	0	0	36	0	36	0	10	0	0	10	45	0	0	0	45	0	163	163
16:00	13	7	27	0	47	0	1	19	0	20	0	2	0	0	2	17	0	0	0	17	0	86	86
16:15	13	10	13	0	36	0	0	7	1	7	0	1	2	0	3	16	3	0	0	19	1	65	66
16:30	9	6	31	0	46	0	1	10	0	11	0	4	0	0	4	11	0	0	0	11	0	72	72
16:45	14	7	26	0	47	1	1	15	0	17	0	4	0	0	4	16	0	0	0	16	0	84	84
Total	49	30	97	0	176	1	3	51	1	55	0	11	2	0	13	60	3	0	0	63	1	307	308
17:00	15	6	22	0	43	0	1	19	0	20	0	7	0	0	7	14	0	0	0	14	0	84	84
17:15	14	5	24	0	43	0	0	11	0	11	0	6	1	0	7	12	0	0	1	12	1	73	74
17:30	14	4	23	0	41	0	0	14	0	14	0	5	1	0	6	17	0	0	0	17	0	78	78
17:45	12	4	29	0	45	0	0	12	0	12	0	6	0	0	6	11	0	0	0	11	0	74	74
Total	55	19	98	0	172	0	1	56	0	57	0	24	2	0	26	54	0	0	1	54	1	309	310
Grand Total	176	68	253	0	497	1	4	184	1	189	0	65	4	0	69	263	5	0	1	268	2	1023	1025
Apprch %	35.4	13.7	50.9			0.5	2.1	97.4			0	94.2	5.8			98.1	1.9	0					
Total %	17.2	6.6	24.7		48.6	0.1	0.4	18		18.5	0	6.4	0.4		6.7	25.7	0.5	0		26.2	0.2	99.8	

Start Time	Flying C Rd Southbound				Crazy Horse Rd Westbound				Flying C Rd Northbound				Crazy Horse Rd Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00	2	1	5	8	0	0	7	7	0	5	0	5	32	0	0	32	52
07:15	4	5	4	13	0	0	7	7	0	0	0	0	20	0	0	20	40
07:30	12	2	7	21	0	0	17	17	0	11	0	11	31	1	0	32	81
07:45	13	6	16	35	0	0	10	10	0	4	0	4	21	1	0	22	71
Total Volume	31	14	32	77	0	0	41	41	0	20	0	20	104	2	0	106	244
% App. Total	40.3	18.2	41.6		0	0	100		0	100	0		98.1	1.9	0		

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 16:45

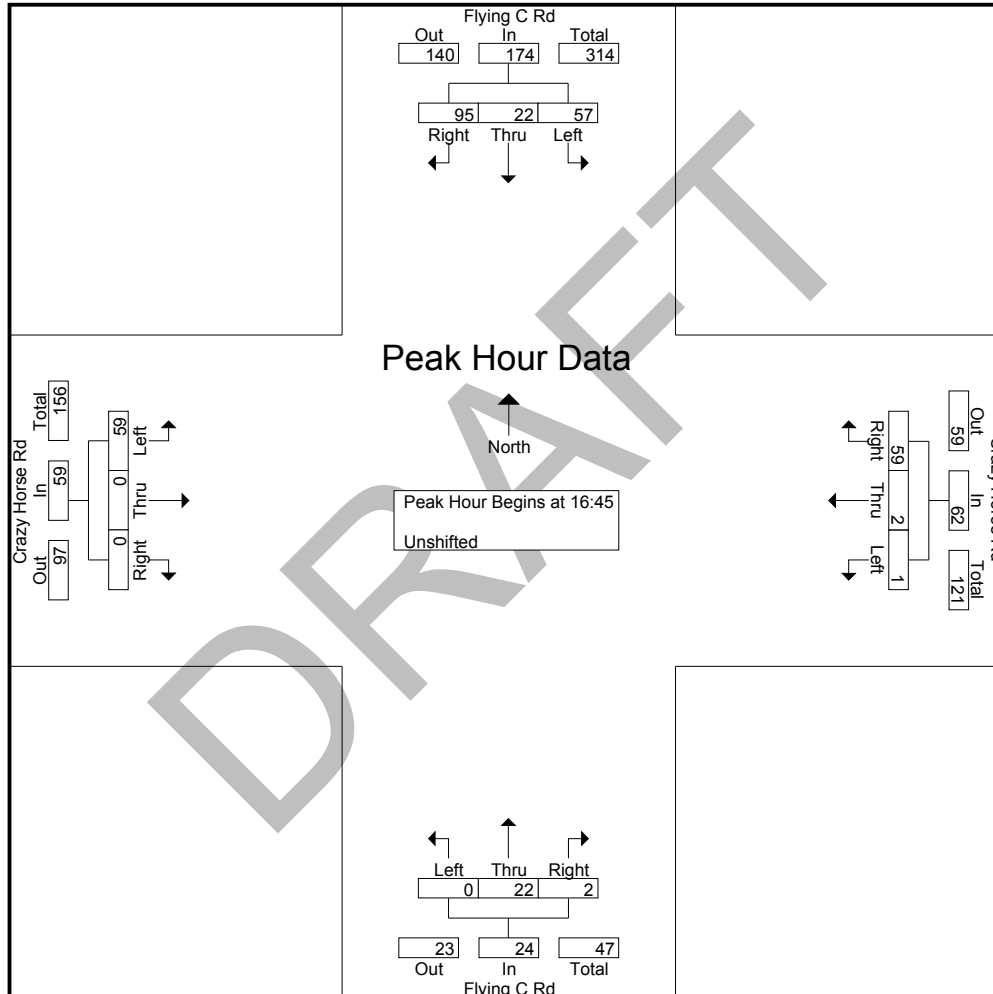
16:45	14	7	26	47	1	1	15	17	0	4	0	4	16	0	0	16	84
17:00	15	6	22	43	0	1	19	20	0	7	0	7	14	0	0	14	84
17:15	14	5	24	43	0	0	11	11	0	6	1	7	12	0	0	12	73
17:30	14	4	23	41	0	0	14	14	0	5	1	6	17	0	0	17	78
Total Volume	57	22	95	174	1	2	59	62	0	22	2	24	59	0	0	59	319
% App. Total	32.8	12.6	54.6		1.6	3.2	95.2		0	91.7	8.3		100	0	0		
PHF	.950	.786	.913	.926	.250	.500	.776	.775	.000	.786	.500	.857	.868	.000	.000	.868	.949

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

File Name : 12-7223-010 Flying C-Crazy Horse
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



All Traffic Data

(916) 771-8700

El Dorado County
Bicycles on Bank 1
Heavy Vehicles on Bank 2

File Name : 12-7223-009 Flying C-Deer Creek
Site Code : 00000000
Start Date : 5/17/2012
Page No : 1

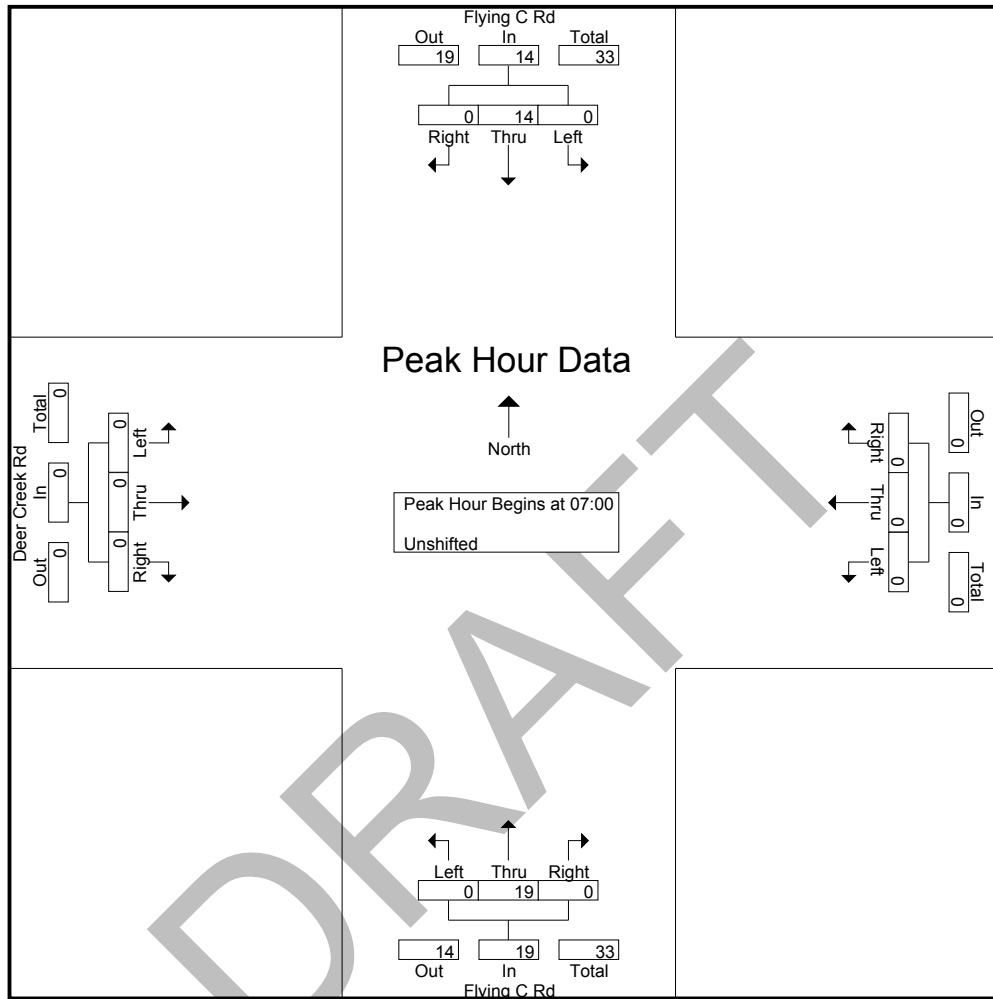
Groups Printed- Unshifted

Start Time	Flying C Rd Southbound					Westbound				Flying C Rd Northbound					Deer Creek Rd Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
07:00	0	1	0	0	1	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	6	6
07:15	0	4	0	0	4	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	6	6
07:30	0	3	0	0	3	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	11	11
07:45	0	6	0	0	6	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	10	10
Total	0	14	0	0	14	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	33	33
08:00	0	2	0	0	2	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	4
08:15	0	3	0	0	3	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	5
08:30	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	3
08:45	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	3
Total	0	5	0	0	5	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	15	15
16:00	0	8	0	0	8	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	9	9
16:15	0	8	0	0	8	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	13	13
16:30	0	6	0	0	6	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	8	8
16:45	0	8	0	0	8	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	12	12
Total	0	30	0	0	30	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	42	42
17:00	0	6	0	0	6	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	13	13
17:15	0	5	0	0	5	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	11	11
17:30	0	4	0	0	4	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	10	10
17:45	0	4	0	0	4	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	10	10
Total	0	19	0	0	19	0	0	0	0	0	25	0	0	25	0	0	0	0	0	0	44	44
Grand Total	0	68	0	0	68	0	0	0	0	0	66	0	0	66	0	0	0	0	0	0	134	134
Apprch %	0	100	0	0		0	0	0	0	0	100	0	0		0	0	0	0	0	0		
Total %	0	50.7	0	0	50.7	0	0	0	0	0	49.3	0	0	49.3	0	0	0	0	0	0	100	

Start Time	Flying C Rd Southbound				Westbound				Flying C Rd Northbound				Deer Creek Rd Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00	0	1	0	1	0	0	0	0	0	5	0	5	0	0	0	0	6
07:15	0	4	0	4	0	0	0	0	0	2	0	2	0	0	0	0	6
07:30	0	3	0	3	0	0	0	0	0	8	0	8	0	0	0	0	11
07:45	0	6	0	6	0	0	0	0	0	4	0	4	0	0	0	0	10
Total Volume	0	14	0	14	0	0	0	0	0	19	0	19	0	0	0	0	33
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:15

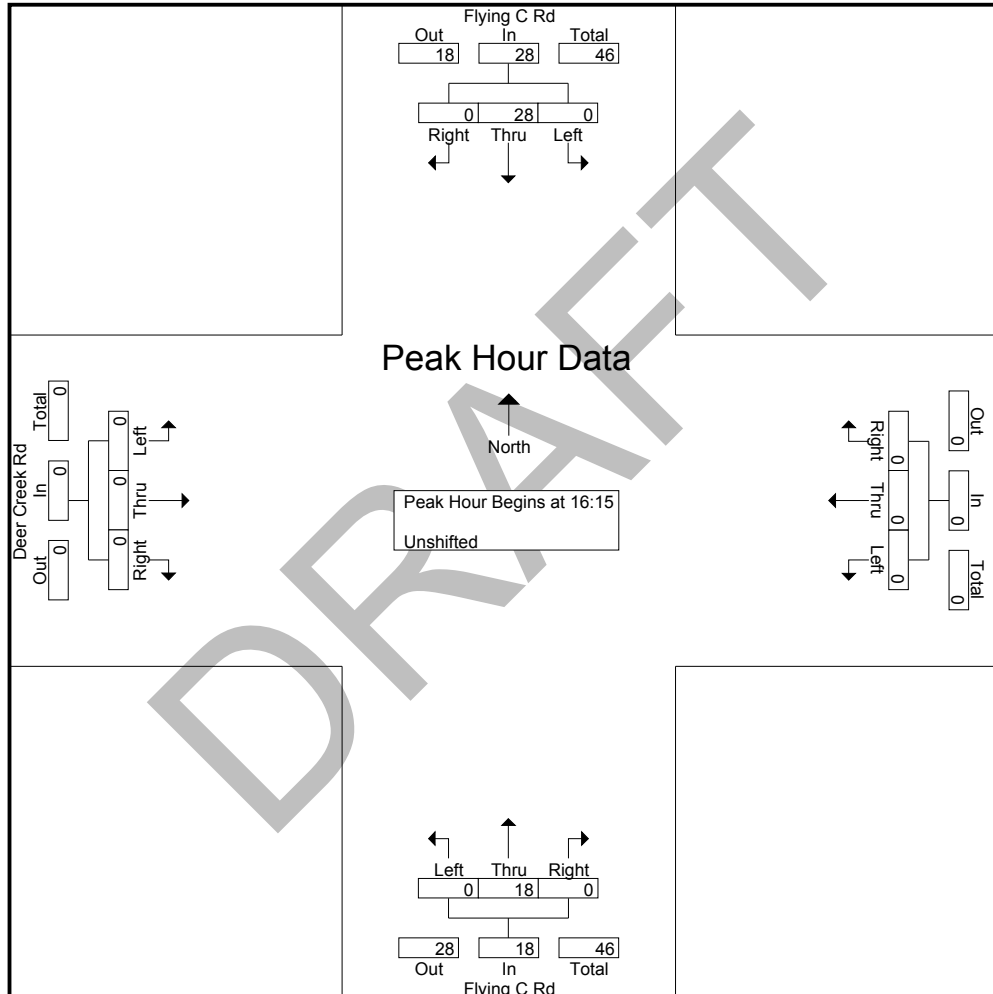
16:15	0	8	0	8	0	0	0	0	0	5	0	5	0	0	0	0	13
16:30	0	6	0	6	0	0	0	0	0	2	0	2	0	0	0	0	8
16:45	0	8	0	8	0	0	0	0	0	4	0	4	0	0	0	0	12
17:00	0	6	0	6	0	0	0	0	0	7	0	7	0	0	0	0	13
Total Volume	0	28	0	28	0	0	0	0	0	18	0	18	0	0	0	0	46
% App. Total	0	100	0		0	0	0	0	0	100	0		0	0	0		
PHF	.000	.875	.000	.875	.000	.000	.000	.000	.000	.643	.000	.643	.000	.000	.000	.000	.885

All Traffic Data

(916) 771-8700

El Dorado County
 Bicycles on Bank 1
 Heavy Vehicles on Bank 2

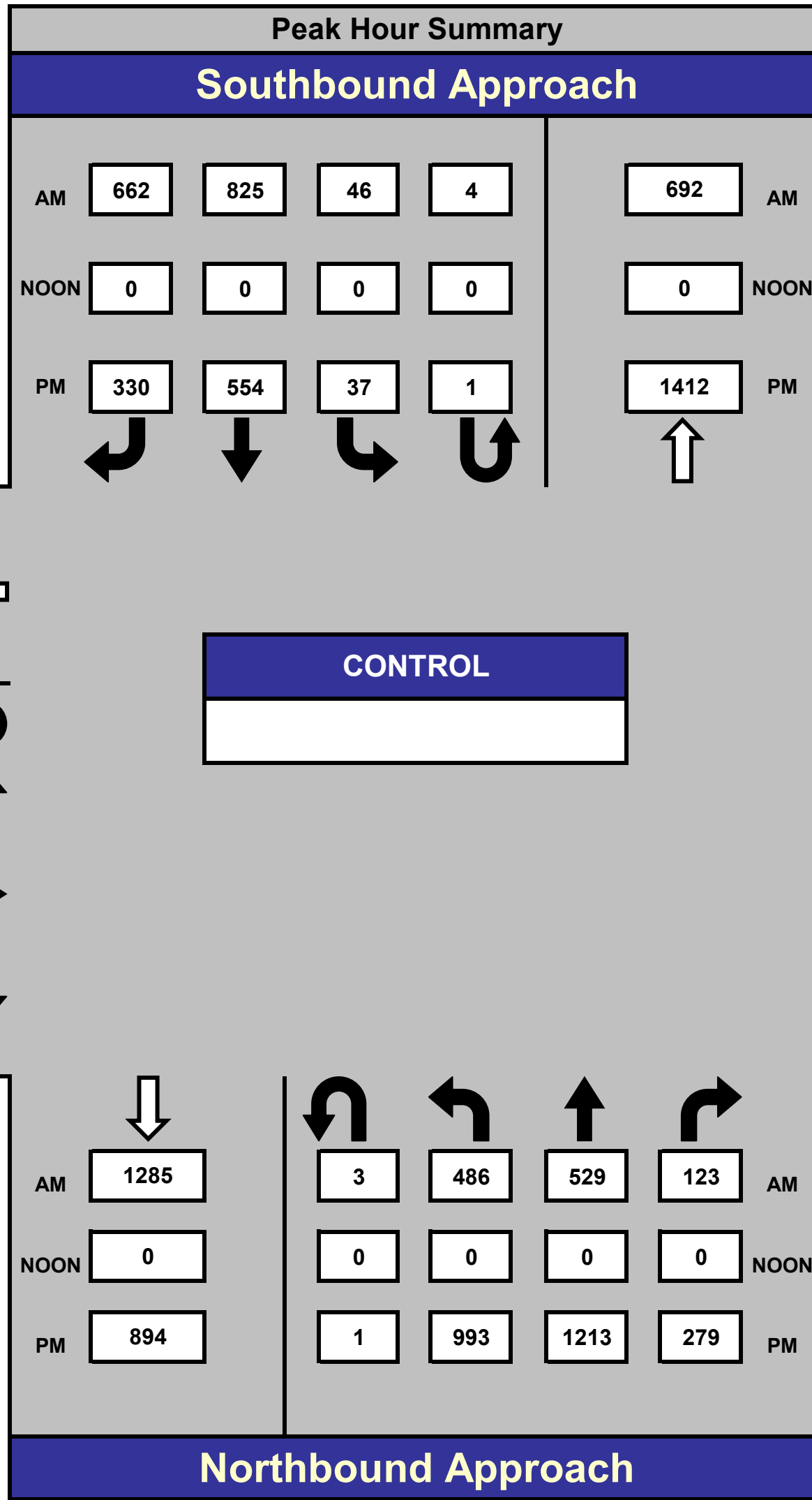
File Name : 12-7223-009 Flying C-Deer Creek
 Site Code : 00000000
 Start Date : 5/17/2012
 Page No : 3



El Dorado Hills Blvd & US 50 WB Ramps/Park Dr

Date: 12/6/2016
Day: Tuesday

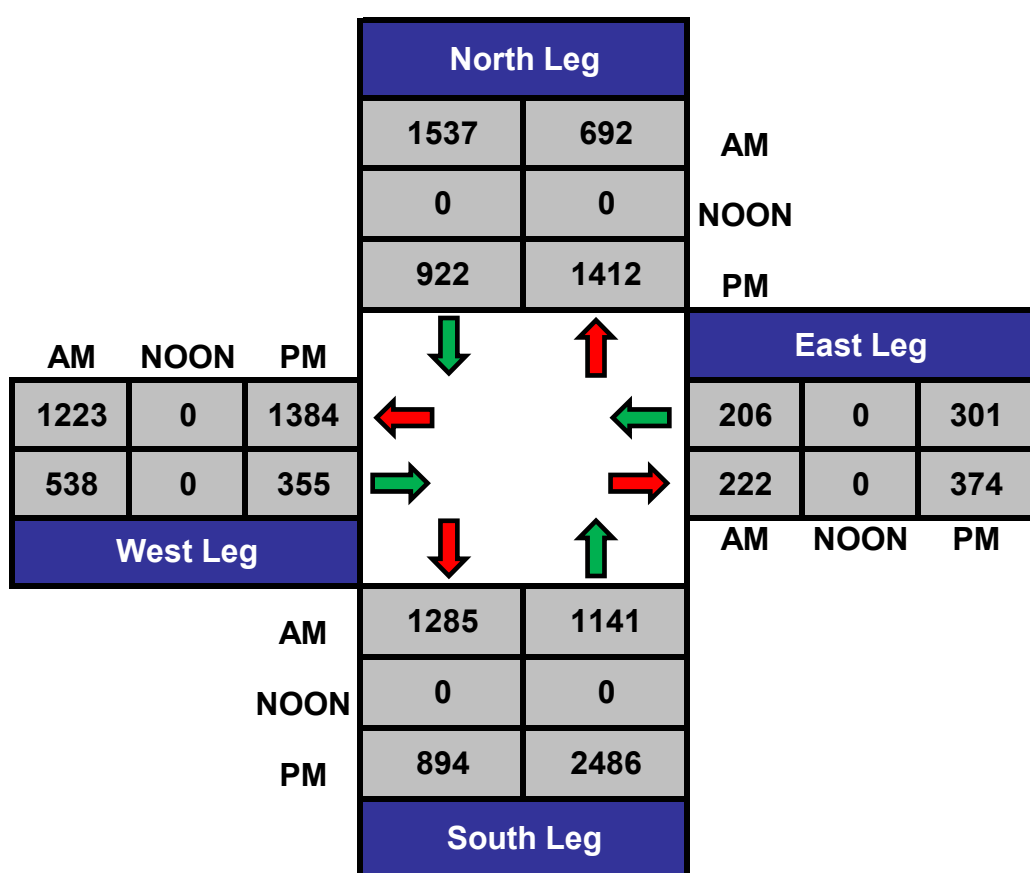
Project #: 16-7916-001



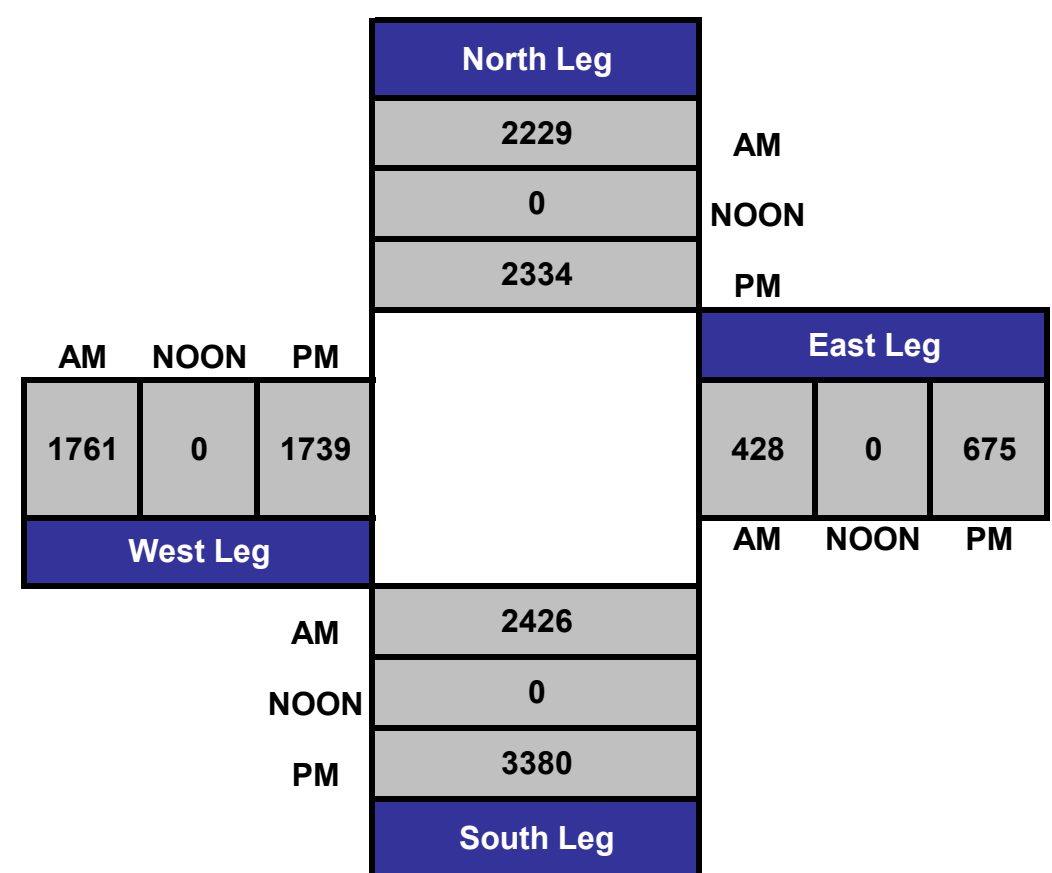
AM Peak Hour	07:45 - 08:45
NOON Peak Hour	
PM Peak Hour	16:45 - 17:45

Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



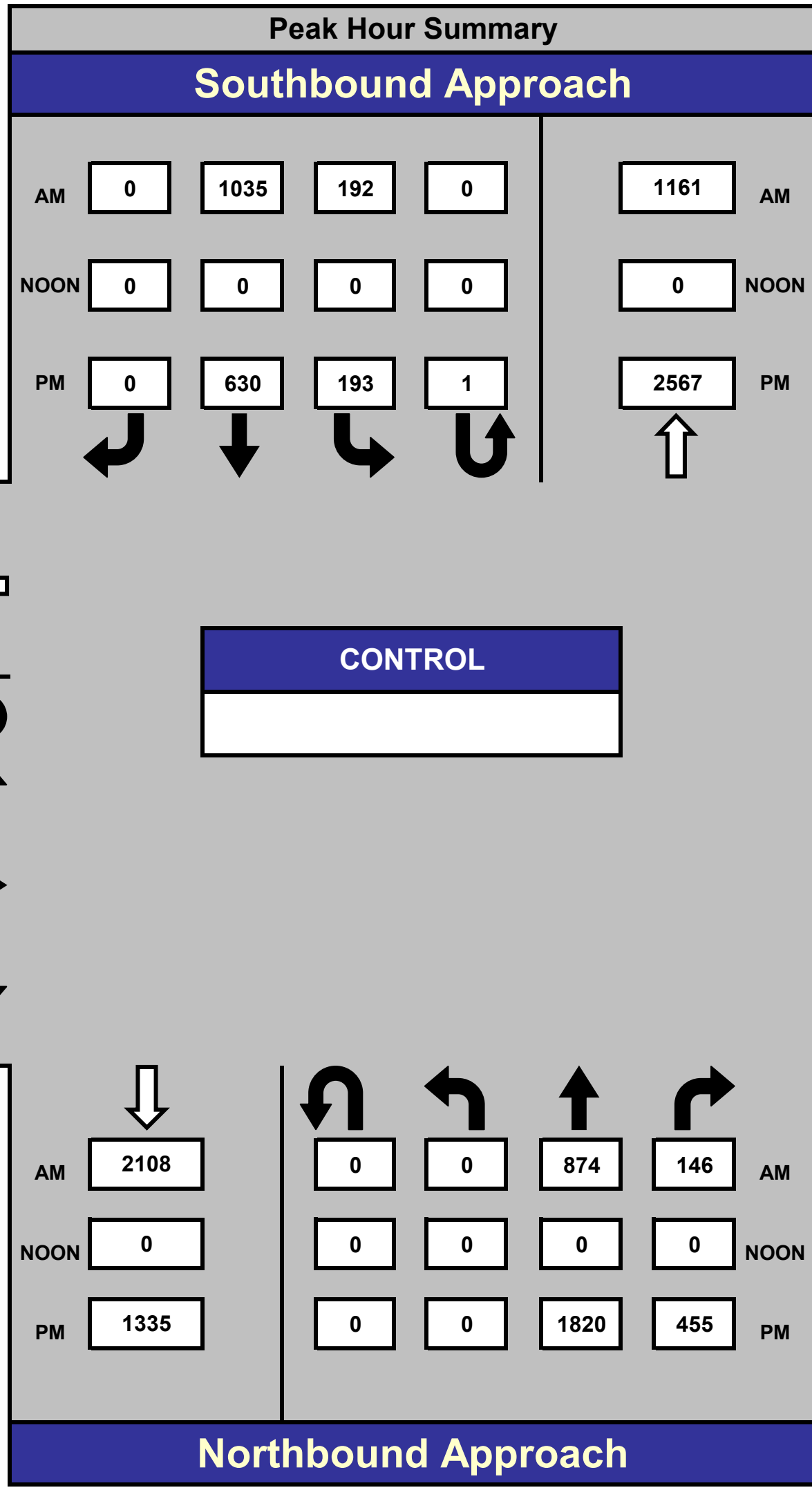
Total Volume Per Leg



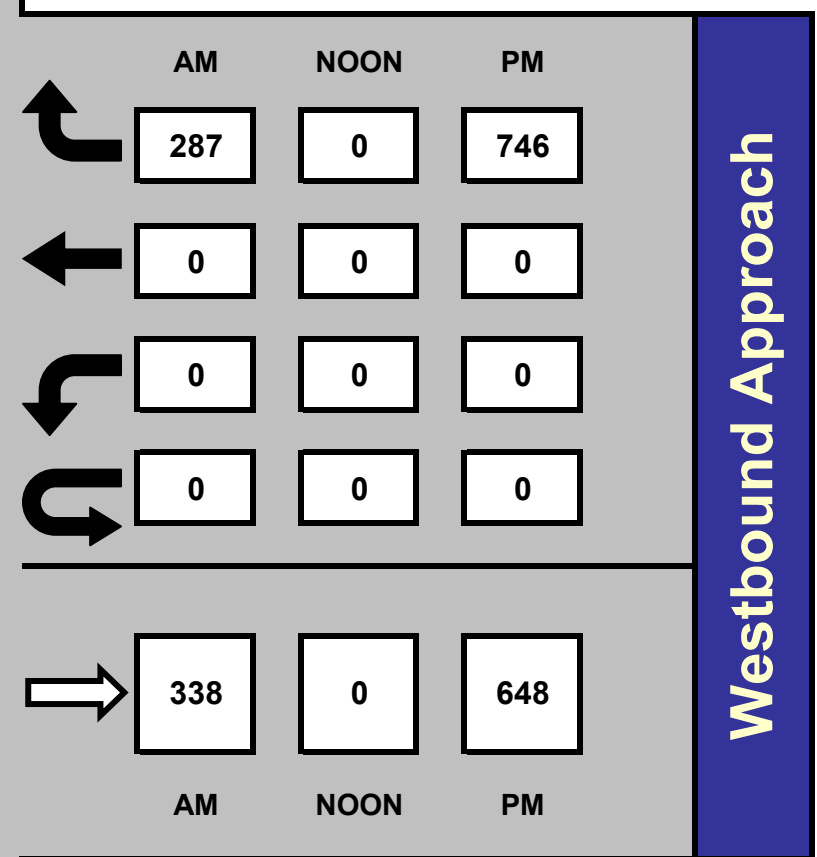
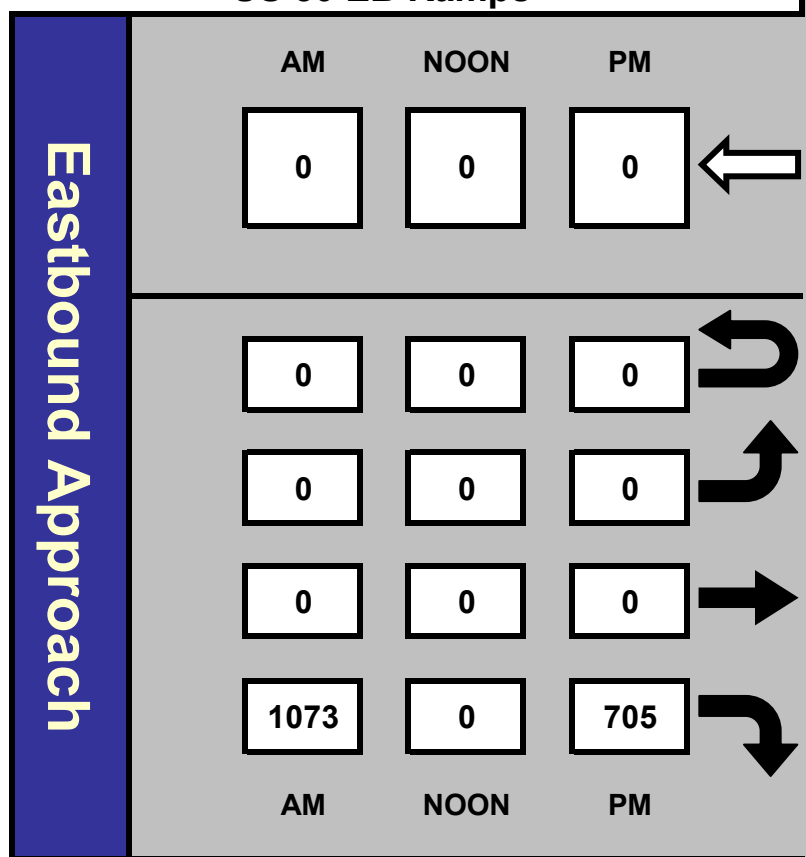
Latrobe Rd & US 50 EB Ramps

Date: 12/6/2016
 Day: Tuesday

Project #: 16-7916-002

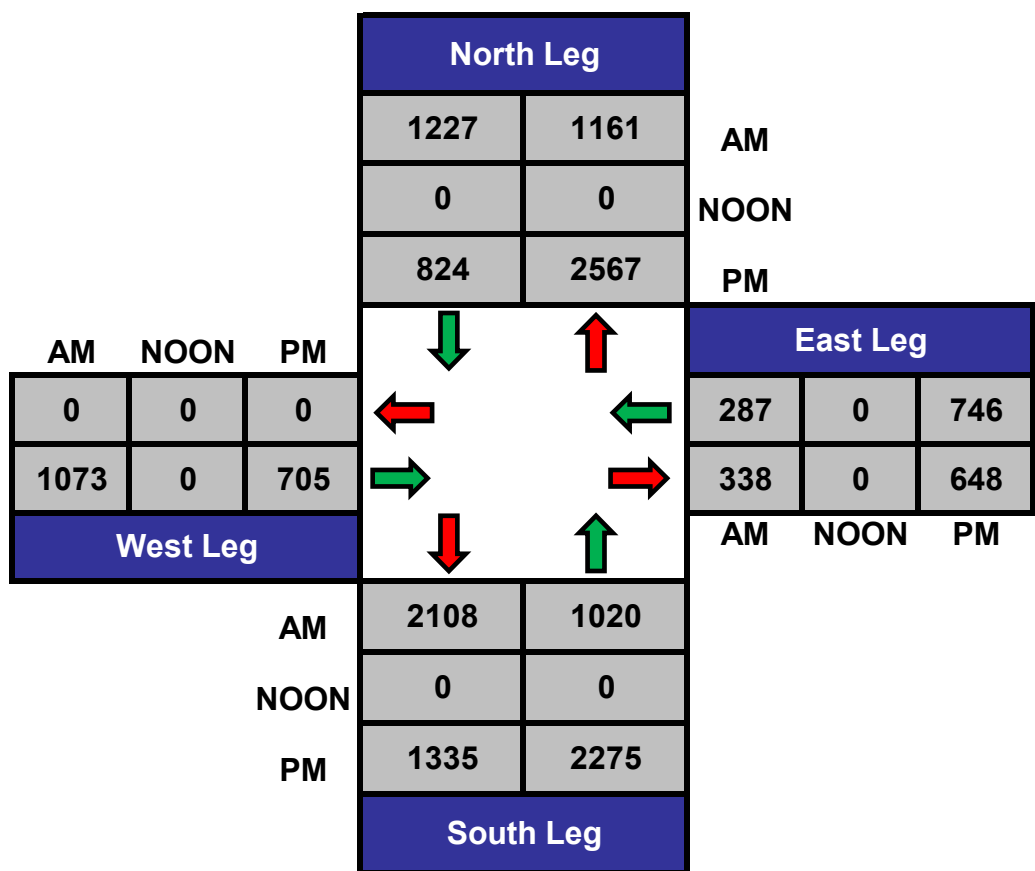


AM Peak Hour	07:45 - 08:45
NOON Peak Hour	
PM Peak Hour	16:45 - 17:45

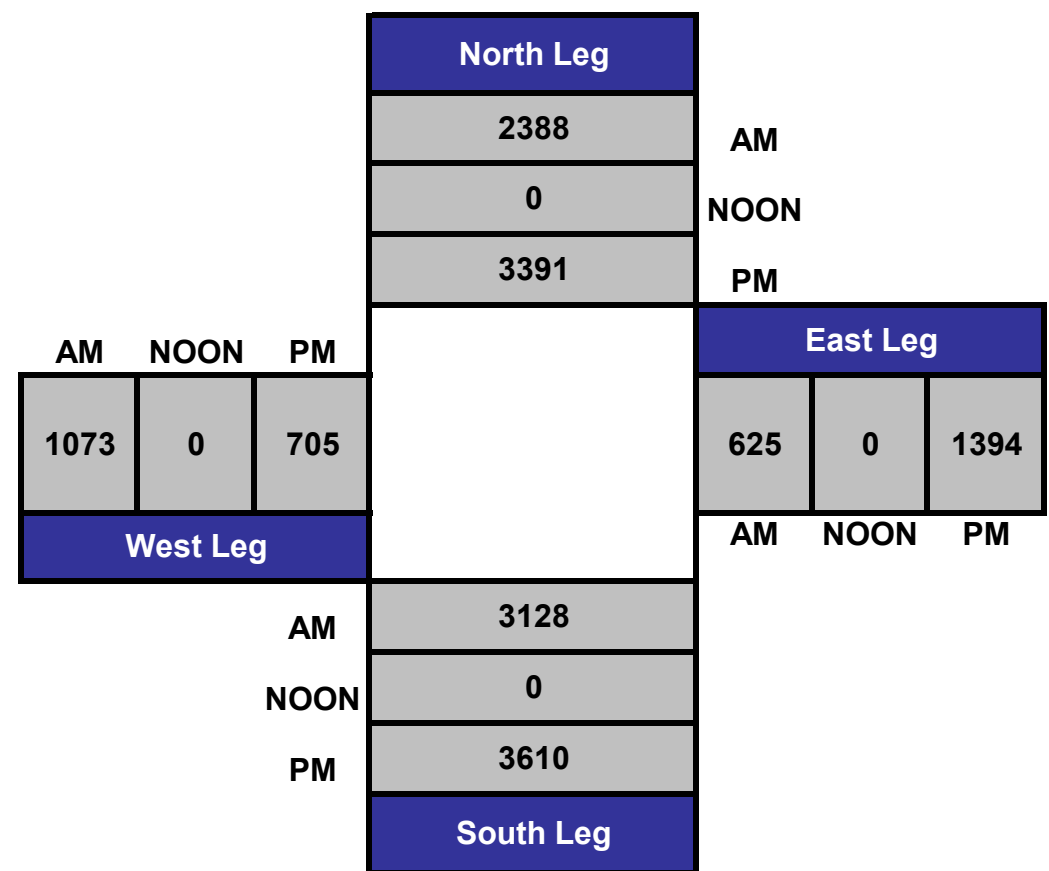


Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



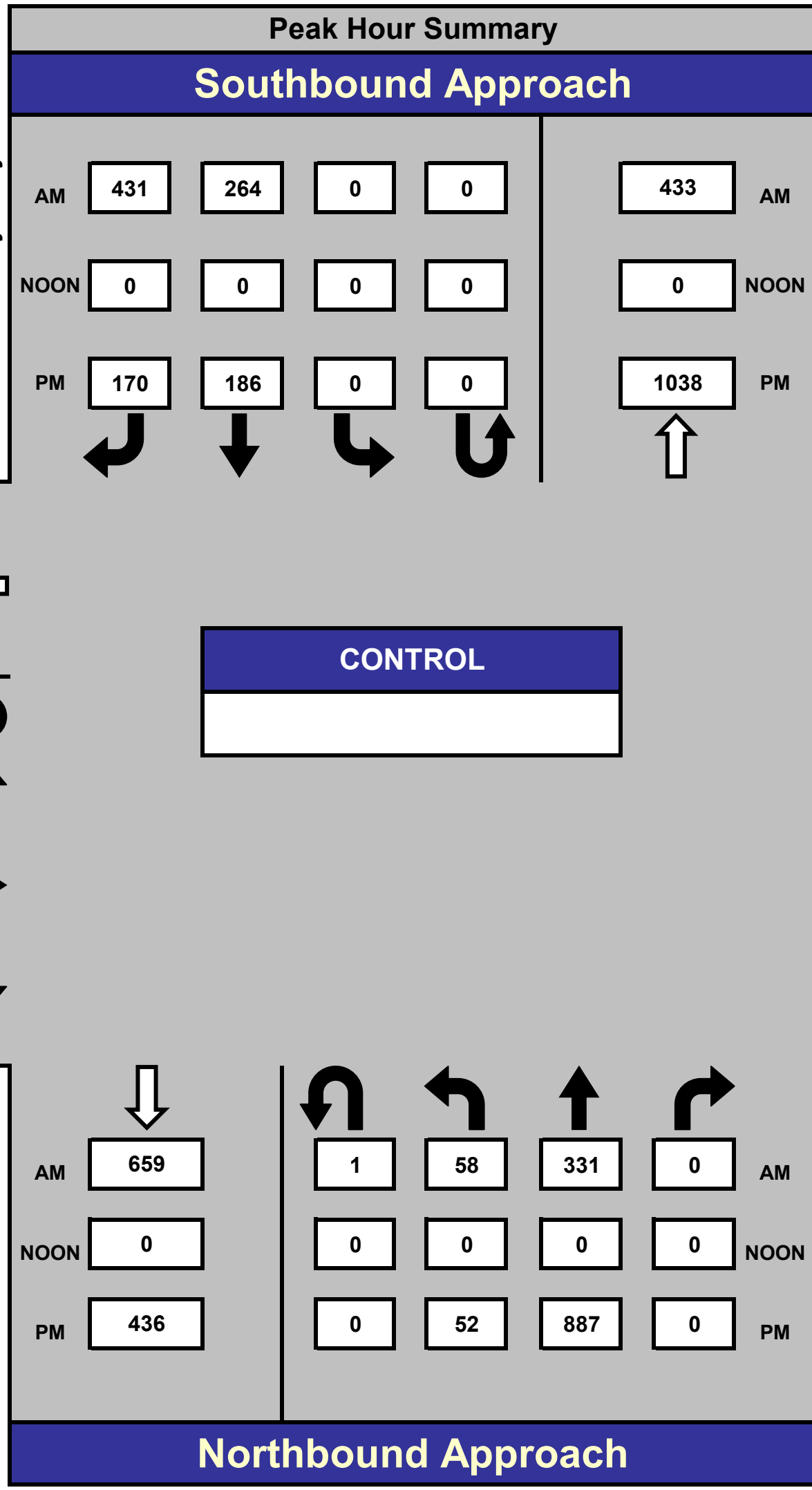
Total Volume Per Leg



Silva Valley Pkwy & US 50 WB Ramps

Date: 12/6/2016
 Day: Tuesday

Project #: 16-7916-003



AM Peak Hour	07:30 - 08:30
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

US 50 WB Ramps

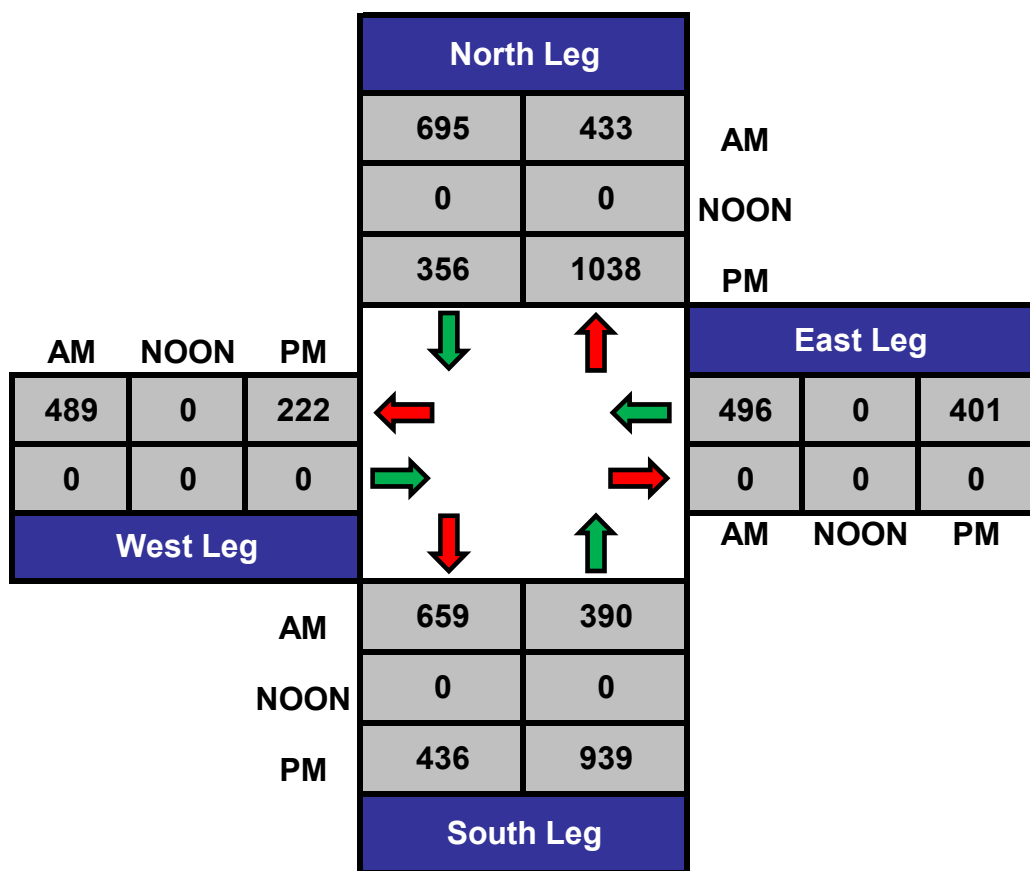
	AM	NOON	PM
Eastbound Approach	489	0	222
US 50 WB Ramps (Top)	0	0	0
US 50 WB Ramps (Middle)	0	0	0
US 50 WB Ramps (Bottom)	0	0	0
US 50 WB Ramps (Bottom)	0	0	0

	AM	NOON	PM
Westbound Approach	102	0	151
US 50 WB Ramps (Top)	0	0	0
US 50 WB Ramps (Middle)	394	0	250
US 50 WB Ramps (Bottom)	0	0	0
US 50 WB Ramps (Bottom)	0	0	0

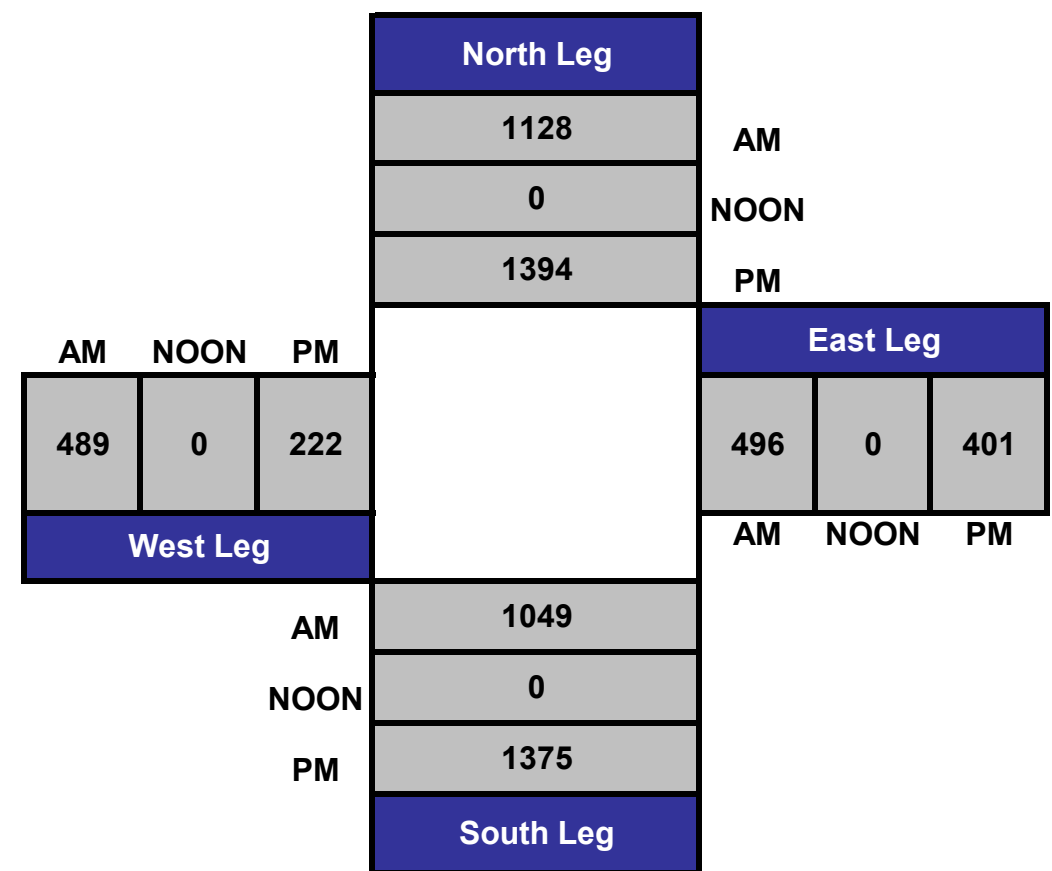
Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

	AM	NOON	PM
Northbound Approach	659	0	436
US 50 WB Ramps (Top)	1	58	331
US 50 WB Ramps (Middle)	0	0	0
US 50 WB Ramps (Bottom)	0	52	887
US 50 WB Ramps (Bottom)	0	0	0

Total Ins & Outs



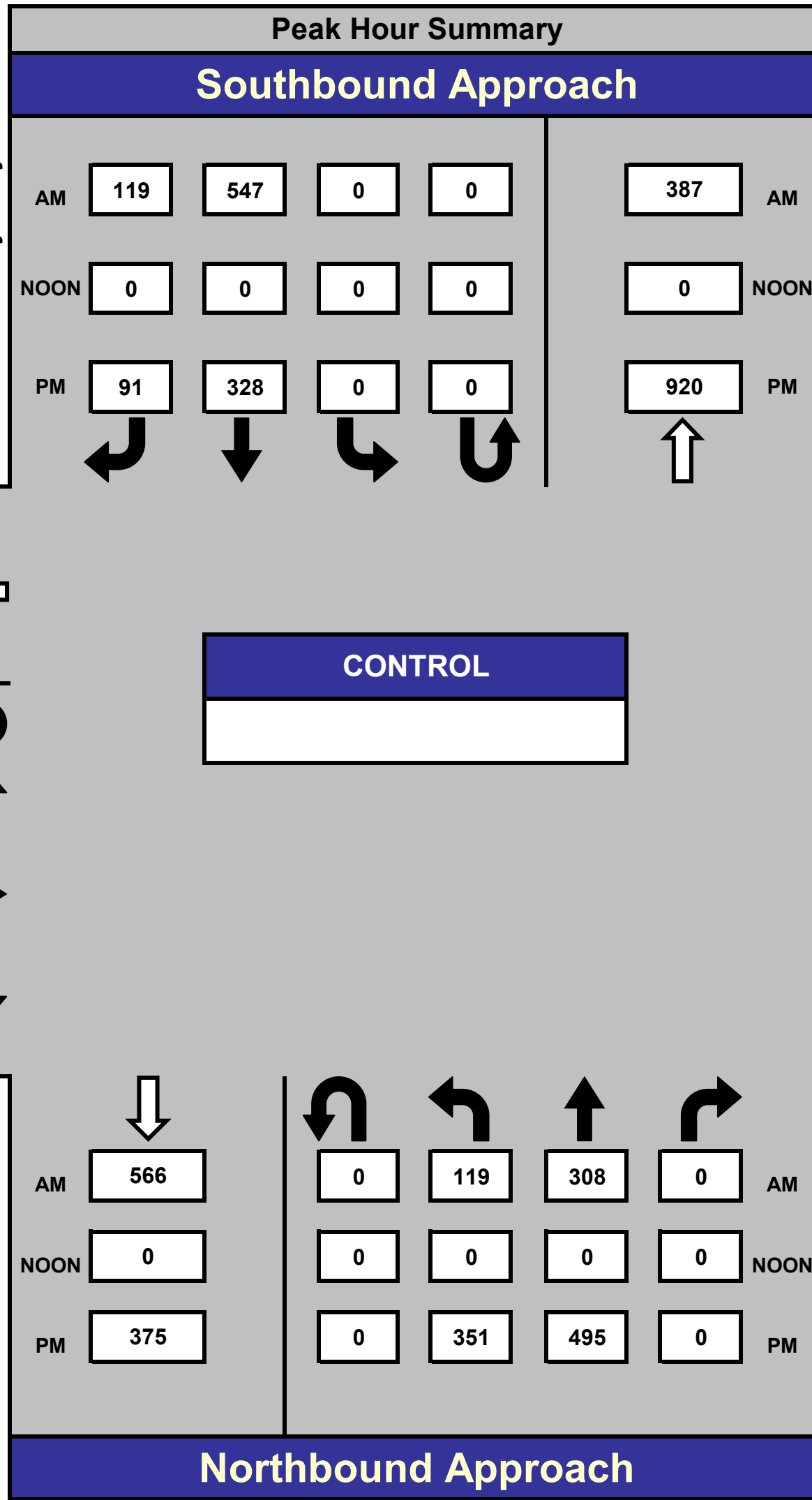
Total Volume Per Leg



Silva Valley Pkwy & US 50 EB Ramps

Date: 12/6/2016
 Day: Tuesday

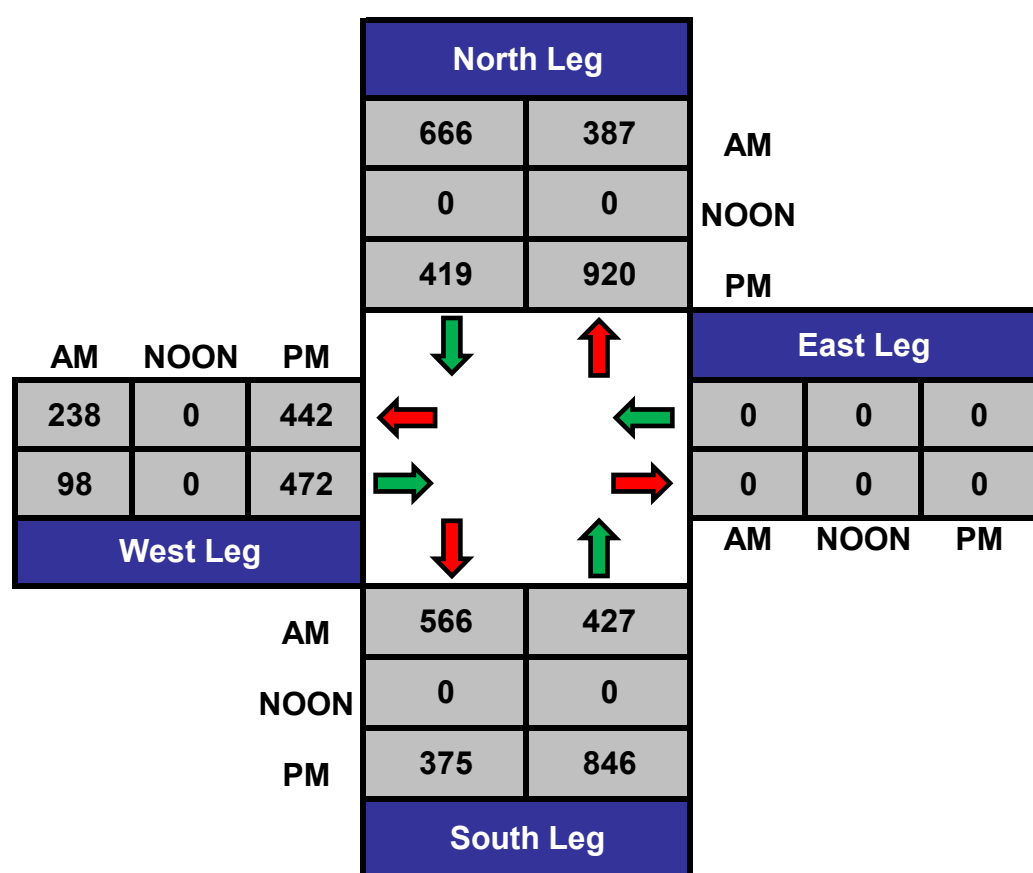
Project #: 16-7916-004



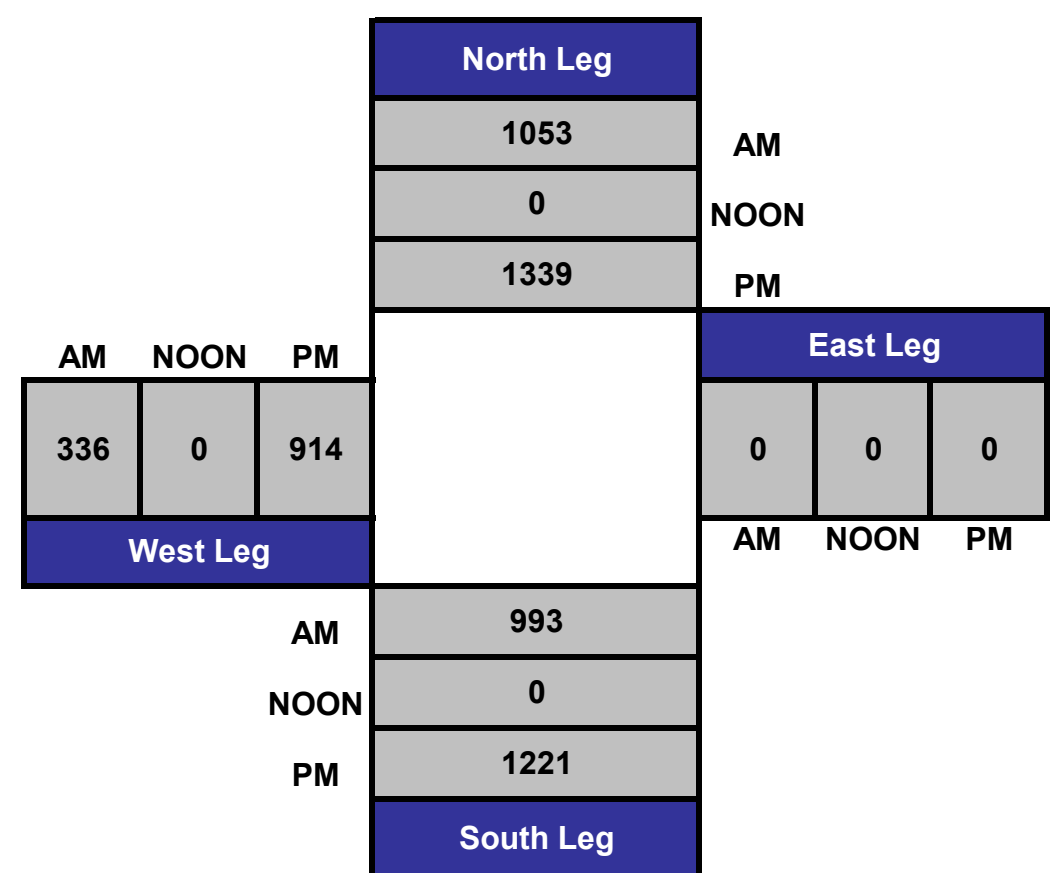
AM Peak Hour	07:30 - 08:30
NOON Peak Hour	
PM Peak Hour	16:45 - 17:45

Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



Total Volume Per Leg



National Data and Surveying Services

City of El Dorado Hills
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Heavy Trucks On Bank 2

(323) 782-0090
info@ndsdata.com

File Name : 16-7916-005 El Dorado Hills Blvd & Saratoga Way
Date : 12/6/2016

Unshifted Count = All Vehicles & Uturns

Table with columns for START TIME, EL DORADO HILLS BLVD (Southbound, Northbound), SARATOGA WAY (Westbound, Eastbound), LEFT, THRU, RIGHT, UTURN, APP.TOTAL, Total, and Uturns Total. Includes data for various time intervals from 6:00 to 18:45 and a Grand Total summary.

Table header for AM PEAK HOUR analysis, showing columns for START TIME, EL DORADO HILLS BLVD (Southbound, Northbound), SARATOGA WAY (Westbound, Eastbound), and Total.

Table for AM PEAK HOUR analysis from 07:30 to 08:30, showing traffic counts for each time slot (7:30-8:15) and totals for volume and PHF.

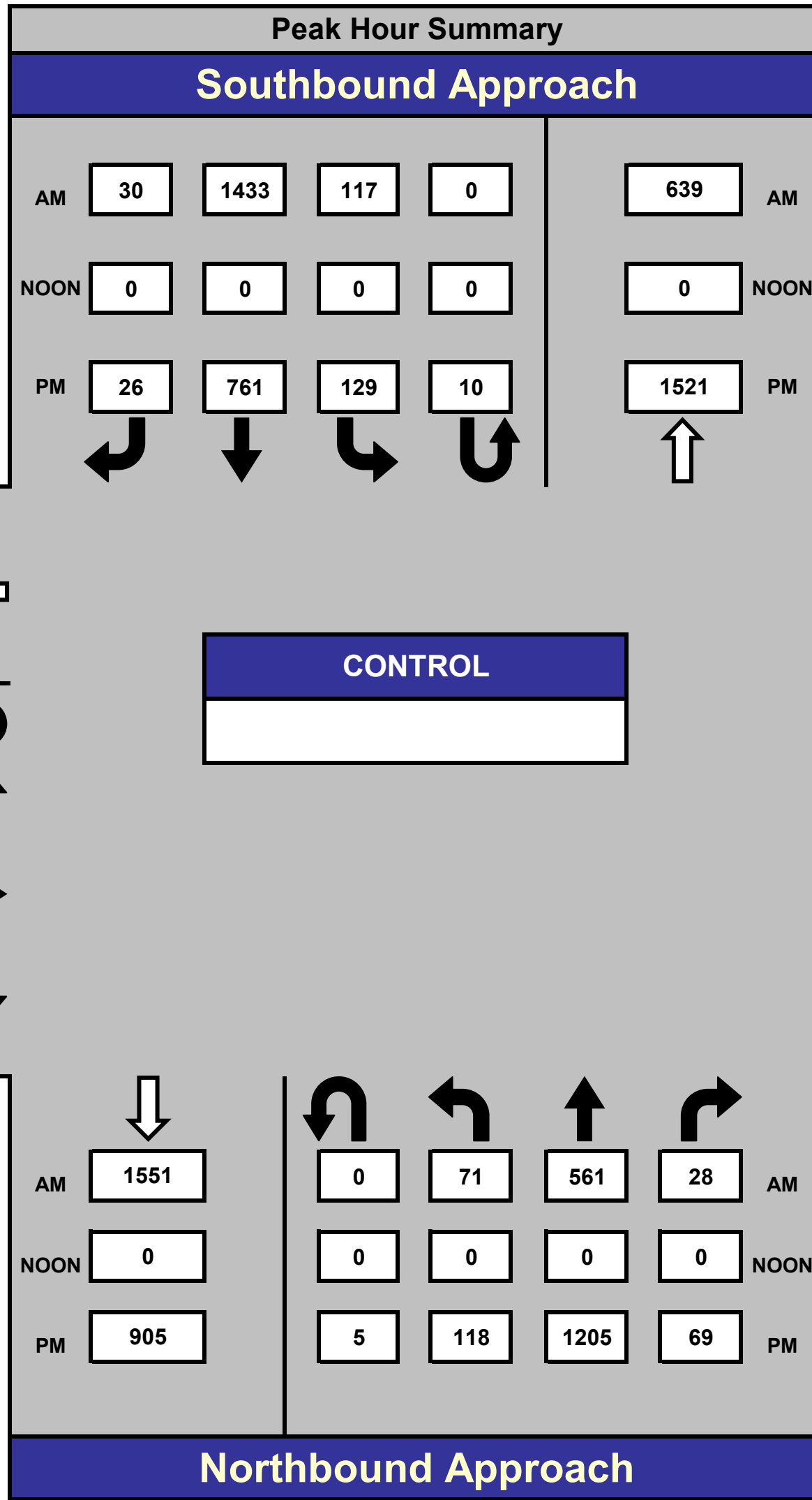
Table header for PM PEAK HOUR analysis, showing columns for START TIME, EL DORADO HILLS BLVD (Southbound, Northbound), SARATOGA WAY (Westbound, Eastbound), and Total.

Table for PM PEAK HOUR analysis from 16:45 to 17:45, showing traffic counts for each time slot (16:45-17:30) and totals for volume and PHF.

El Dorado Hills Blvd & Saratoga Way

Date: 12/6/2016
Day: Tuesday

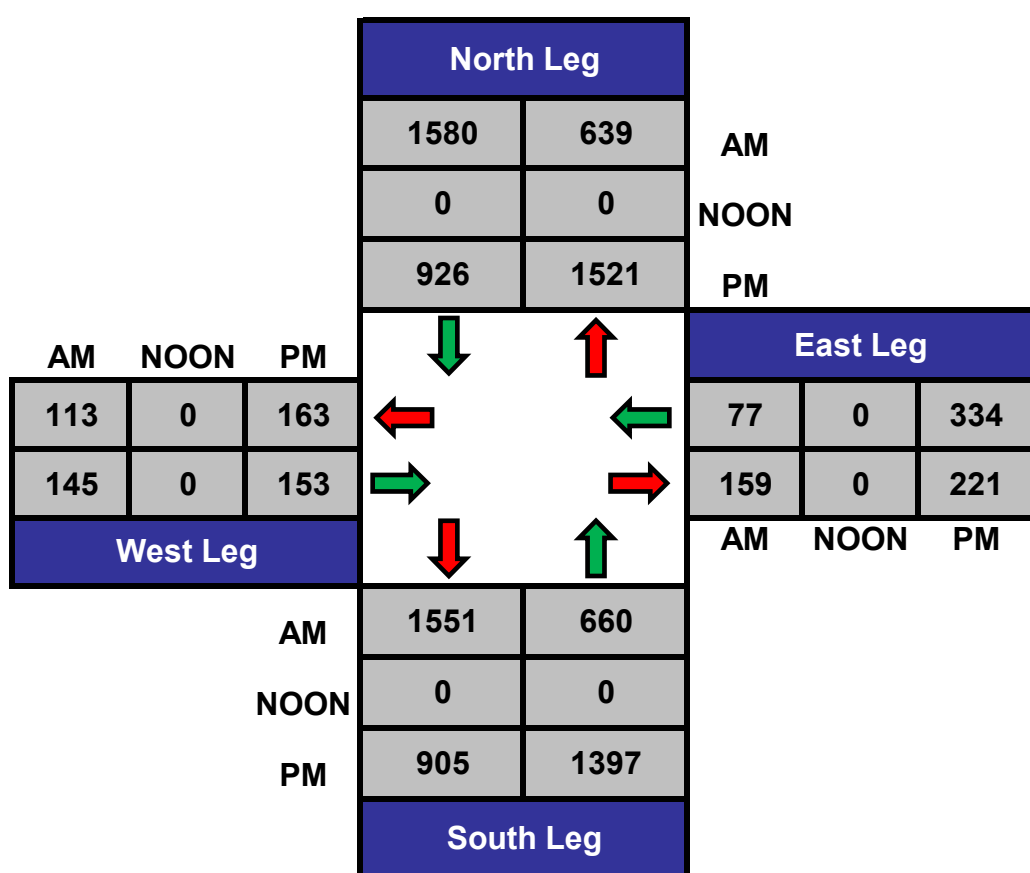
Project #: 16-7916-005



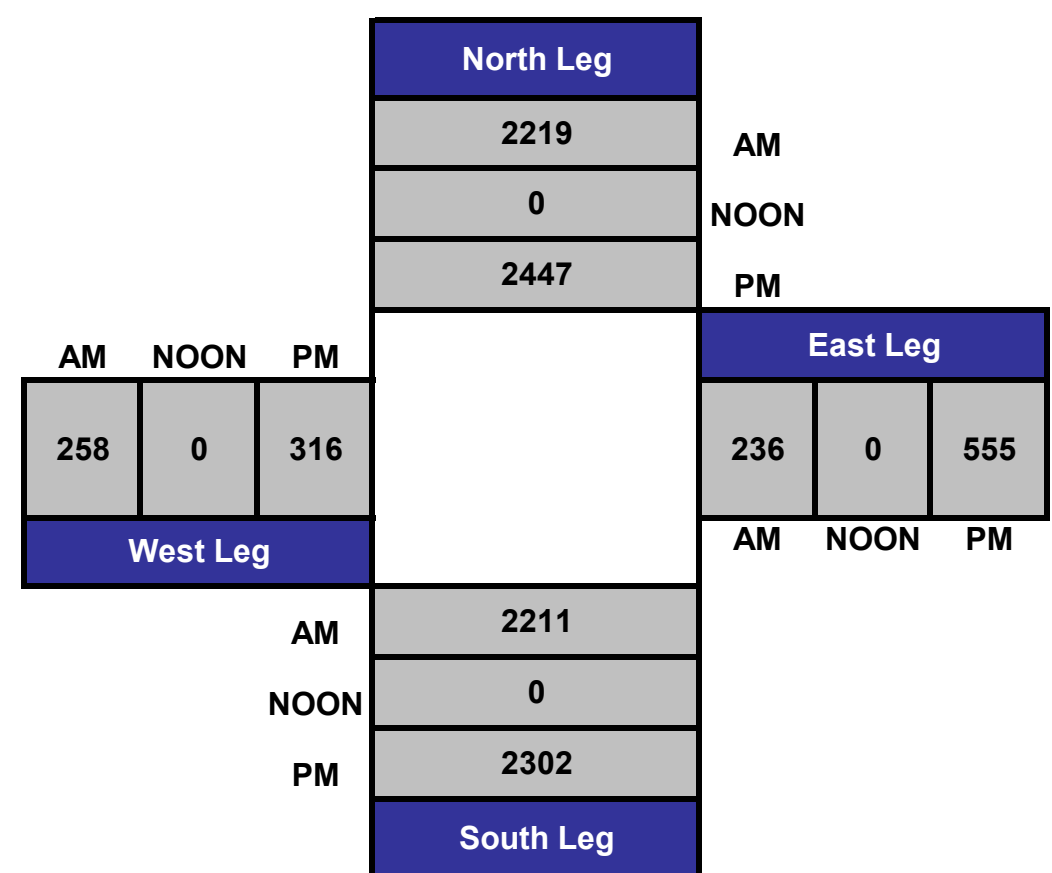
AM Peak Hour	07:30 - 08:30
NOON Peak Hour	
PM Peak Hour	16:45 - 17:45

Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



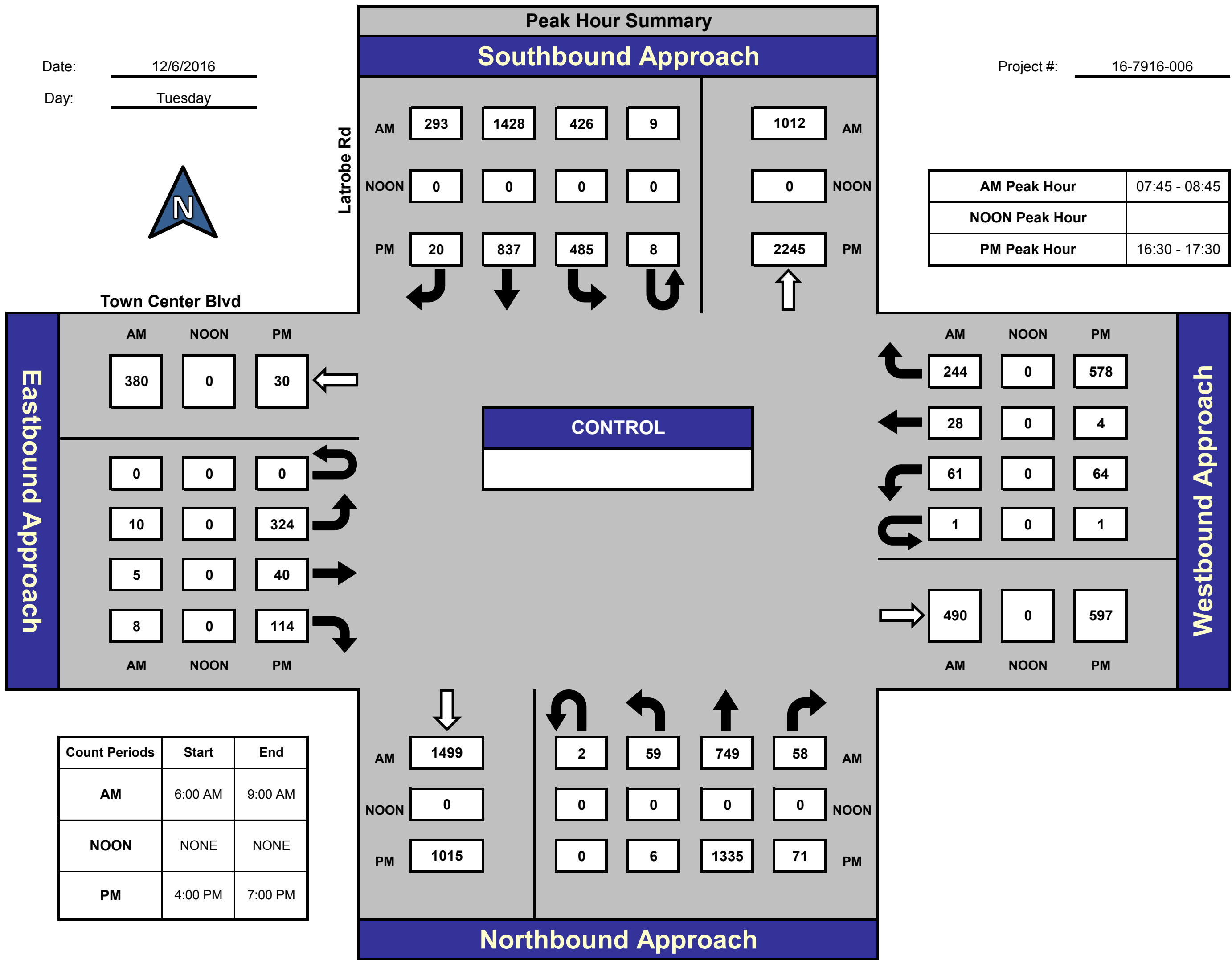
Total Volume Per Leg



Latrobe Rd & Town Center Blvd

Date: 12/6/2016
Day: Tuesday

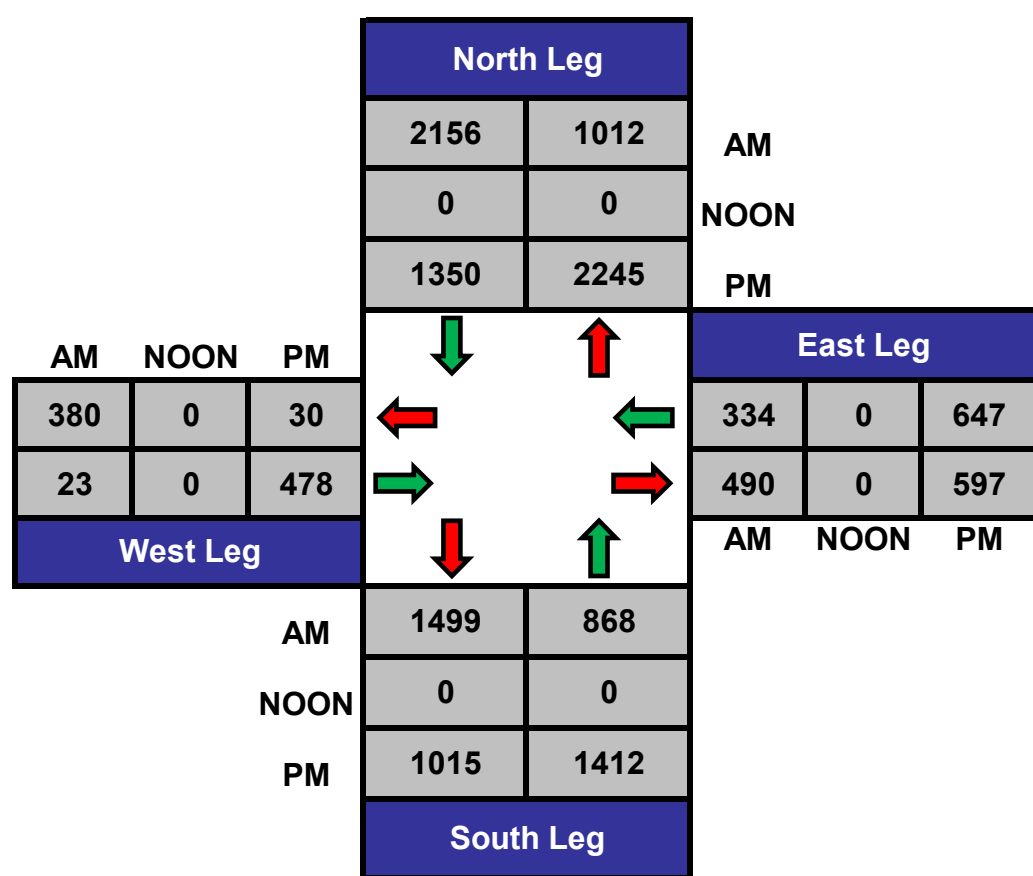
Project #: 16-7916-006



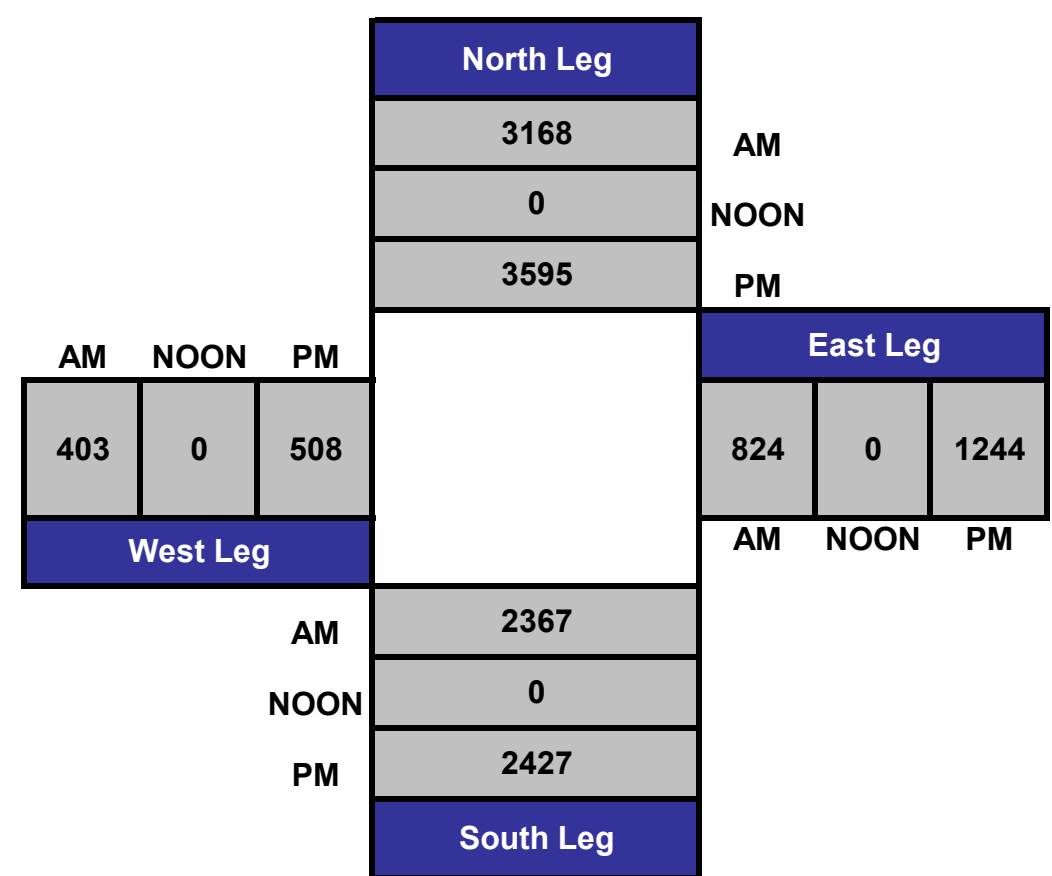
AM Peak Hour	07:45 - 08:45
NOON Peak Hour	
PM Peak Hour	16:30 - 17:30

Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



Total Volume Per Leg



Latrobe Rd & White Rock Rd

Date: 12/6/2016
Day: Tuesday

Project #: 16-7916-007



Peak Hour Summary

Southbound Approach

Latrobe Rd	AM	342	1044	109	2	868	AM
	NOON	0	0	0	0	0	NOON
	PM	234	573	214	7	1437	PM

AM Peak Hour	07:45 - 08:45
NOON Peak Hour	
PM Peak Hour	16:15 - 17:15

White Rock Rd

Eastbound Approach

AM	NOON	PM
669	0	481
2	0	1
216	0	313
99	0	299
42	0	100
AM	NOON	PM

Westbound Approach

AM	NOON	PM
154	0	187
252	0	151
321	0	181
0	0	1
355	0	860
AM	NOON	PM

CONTROL

Count Periods	Start	End
AM	6:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

	AM	1407	0	73	496	147	AM
	NOON	0	0	0	0	0	NOON
	PM	861	7	95	930	346	PM

Northbound Approach

Total Ins & Outs

			North Leg		
			1497	868	AM
			0	0	NOON
			1028	1437	PM
AM	NOON	PM			
669	0	481			
359	0	713			
West Leg			East Leg		
			727	0	520
			355	0	860
			AM	NOON	PM
AM	NOON	PM			
1407	0	716			
0	0	0			
861	0	1378			
South Leg					

Total Volume Per Leg

			North Leg		
			2365		AM
			0		NOON
			2465		PM
AM	NOON	PM			
1028	0	1194			
West Leg			East Leg		
			1082	0	1380
			AM	NOON	PM
AM	NOON	PM			
2123	0	2239			
0	0	0			
2239	0	0			
South Leg					

13-7462-001 El Dorado Hills Mainline Count

US-50 between El Dorado Hills Blvd and East Bidwell Street

Tuesday, August 20, 2013

	Eastbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
6:00 AM	202	12	9	0	223
6:15 AM	266	21	11	0	298
6:30 AM	385	22	17	0	424
6:45 AM	496	24	16	0	536
7:00 AM	477	35	12	0	524
7:15 AM	558	24	26	0	608
7:30 AM	566	20	27	0	613
7:45 AM	714	20	28	0	762
8:00 AM	617	23	30	0	670
8:15 AM	611	37	34	0	682
8:30 AM	598	33	32	0	663
8:45 AM	580	31	33	0	644
Totals:	6070	302	275	0	6647

	Westbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
6:00 AM	626	14	61	4	705
6:15 AM	765	16	58	0	839
6:30 AM	887	16	79	1	983
6:45 AM	938	15	80	1	1034
7:00 AM	1086	11	80	0	1177
7:15 AM	1072	18	118	1	1209
7:30 AM	893	6	123	0	1022
7:45 AM	725	19	144	1	889
8:00 AM	852	21	119	0	992
8:15 AM	872	20	103	0	995
8:30 AM	881	23	76	0	980
8:45 AM	771	17	58	0	846
Totals:	10368	196	1099	8	11671

	Eastbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
3:00 PM	716	12	76	0	804
3:15 PM	815	9	84	0	908
3:30 PM	887	13	129	0	1029
3:45 PM	972	8	109	0	1089
4:00 PM	974	12	119	0	1105
4:15 PM	970	5	121	0	1096
4:30 PM	1009	8	122	0	1139
4:45 PM	1068	3	148	0	1219
5:00 PM	1066	8	123	0	1197
5:15 PM	1133	8	129	0	1270
5:30 PM	1052	2	102	0	1156
5:45 PM	997	6	111	0	1114
Totals:	11659	94	1373	0	13126

	Westbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
3:00 PM	655	22	56	1	734
3:15 PM	643	23	79	0	745
3:30 PM	683	34	74	1	792
3:45 PM	631	17	62	0	710
4:00 PM	664	19	66	0	749
4:15 PM	731	16	58	0	805
4:30 PM	698	19	53	0	770
4:45 PM	667	27	57	1	752
5:00 PM	784	16	65	0	865
5:15 PM	778	4	67	0	849
5:30 PM	714	6	66	0	786
5:45 PM	680	12	66	0	758
Totals:	8328	215	769	3	9315

13-7462-001 El Dorado Hills Mainline Count

US-50 between El Dorado Hills Blvd and East Bidwell Street

Wednesday, August 21, 2013

	Eastbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
6:00 AM	218	12	12	0	242
6:15 AM	248	25	10	0	283
6:30 AM	361	28	30	0	419
6:45 AM	532	43	21	0	596
7:00 AM	426	32	25	0	483
7:15 AM	562	29	29	0	620
7:30 AM	631	35	43	0	709
7:45 AM	674	22	43	0	739
8:00 AM	558	29	40	0	627
8:15 AM	581	30	28	0	639
8:30 AM	582	25	33	0	640
8:45 AM	557	31	27	0	615
Totals:	5930	341	341	0	6612

	Westbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
6:00 AM	579	14	55	0	648
6:15 AM	718	15	59	0	792
6:30 AM	876	15	81	0	972
6:45 AM	959	12	67	0	1038
7:00 AM	1028	17	88	0	1133
7:15 AM	1047	14	141	0	1202
7:30 AM	1016	25	164	0	1205
7:45 AM	944	19	124	1	1088
8:00 AM	965	20	99	0	1084
8:15 AM	820	26	72	0	918
8:30 AM	777	28	80	0	885
8:45 AM	769	28	57	0	854
Totals:	10498	233	1087	1	11819

	Eastbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
3:00 PM	785	8	103	0	896
3:15 PM	777	9	76	0	862
3:30 PM	868	9	121	0	998
3:45 PM	994	8	119	0	1121
4:00 PM	932	7	117	0	1056
4:15 PM	1038	6	129	0	1173
4:30 PM	1068	8	108	0	1184
4:45 PM	988	4	135	0	1127
5:00 PM	1044	6	125	0	1175
5:15 PM	1066	5	136	0	1207
5:30 PM	1046	8	128	0	1182
5:45 PM	1006	6	137	0	1149
Totals:	11612	84	1434	0	13130

	Westbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
3:00 PM	680	28	69	0	777
3:15 PM	663	22	67	0	752
3:30 PM	655	34	68	0	757
3:45 PM	659	23	63	0	745
4:00 PM	700	13	47	1	761
4:15 PM	681	17	51	0	749
4:30 PM	730	10	60	0	800
4:45 PM	717	17	68	1	803
5:00 PM	711	15	59	0	785
5:15 PM	770	11	56	0	837
5:30 PM	638	14	50	0	702
5:45 PM	655	11	46	0	712
Totals:	8259	215	704	2	9180

13-7462-001 El Dorado Hills Mainline Count

US-50 between El Dorado Hills Blvd and East Bidwell Street

Thursday, August 22, 2013

	Eastbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
6:00 AM	179	22	5	0	206
6:15 AM	254	27	13	0	294
6:30 AM	408	28	19	0	455
6:45 AM	490	20	27	0	537
7:00 AM	451	22	25	0	498
7:15 AM	581	21	48	0	650
7:30 AM	675	33	53	0	761
7:45 AM	673	22	25	0	720
8:00 AM	596	22	33	0	651
8:15 AM	646	36	35	0	717
8:30 AM	627	40	41	0	708
8:45 AM	682	19	34	0	735
Totals:	6262	312	358	0	6932
























	Westbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
6:00 AM	599	10	49	0	658
6:15 AM	677	11	50	0	738
6:30 AM	860	18	83	0	961
6:45 AM	949	16	79	0	1044
7:00 AM	1000	15	91	0	1106
7:15 AM	1012	19	125	1	1157
7:30 AM	985	17	122	1	1125
7:45 AM	964	21	129	0	1114
8:00 AM	915	22	112	3	1052
8:15 AM	849	15	65	0	929
8:30 AM	807	15	72	0	894
8:45 AM	738	20	53	0	811
Totals:	10355	199	1030	5	11589

	Eastbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
3:00 PM	839	15	105	0	959
3:15 PM	871	14	115	1	1001
3:30 PM	869	17	128	0	1014
3:45 PM	981	5	115	0	1101
4:00 PM	951	9	108	0	1068
4:15 PM	1044	9	129	0	1182
4:30 PM	1048	4	125	0	1177
4:45 PM	1149	6	165	0	1320
5:00 PM	1067	4	148	0	1219
5:15 PM	1137	7	141	0	1285
5:30 PM	1095	5	140	0	1240
5:45 PM	1026	2	137	0	1165
Totals:	12077	97	1556	1	13731

	Westbound				
	Non-HOV		HOV Lane		Total
	Vehicles	Trucks	HOV Lane	HOV Trucks	
3:00 PM	645	36	67	1	749
3:15 PM	671	36	70	0	777
3:30 PM	694	29	60	1	784
3:45 PM	681	23	85	0	789
4:00 PM	675	19	71	0	765
4:15 PM	736	15	78	0	829
4:30 PM	678	21	58	0	757
4:45 PM	712	23	81	0	816
5:00 PM	744	17	56	0	817
5:15 PM	730	11	62	0	803
5:30 PM	697	11	51	0	759
5:45 PM	617	22	60	0	699
Totals:	8280	263	799	2	9344

HCM Signalized Intersection Capacity Analysis
 1: Bass Lake Road & Serrano Parkway

Existing Conditions
 AM Peak Hour



















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	106	100	10	10	504	85	10	10	10	37	10	225	
Future Volume (vph)	106	100	10	10	504	85	10	10	10	37	10	225	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00		1.00	0.98		
Flpb, ped/bikes	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	0.93		1.00	0.86		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1719	1810	1583	1770	1863	1548	1770	1723		1770	1561		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1719	1810	1583	1770	1863	1548	1770	1723		1770	1561		
Peak-hour factor, PHF	0.79	0.79	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86	
Adj. Flow (vph)	134	127	11	11	586	99	11	11	11	43	11	262	
RTOR Reduction (vph)	0	0	4	0	0	48	0	11	0	0	234	0	
Lane Group Flow (vph)	134	127	7	11	586	51	11	11	0	43	39	0	
Confl. Peds. (#/hr)	2					2				2		2	
Heavy Vehicles (%)	5%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	5	2		1	6		8	8		4	4		
Permitted Phases			2			6							
Actuated Green, G (s)	9.1	46.2	46.2	0.7	37.8	37.8	2.4	2.4		7.9	7.9		
Effective Green, g (s)	9.1	46.2	46.2	0.7	37.8	37.8	2.4	2.4		7.9	7.9		
Actuated g/C Ratio	0.12	0.63	0.63	0.01	0.52	0.52	0.03	0.03		0.11	0.11		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	213	1142	999	16	962	799	58	56		191	168		
v/s Ratio Prot	c0.08	0.07		0.01	c0.31		0.01	c0.01		0.02	c0.03		
v/s Ratio Perm			0.00			0.03							
v/c Ratio	0.63	0.11	0.01	0.69	0.61	0.06	0.19	0.20		0.23	0.23		
Uniform Delay, d1	30.4	5.4	5.0	36.1	12.5	8.9	34.5	34.5		29.9	29.9		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	5.7	0.0	0.0	80.1	1.1	0.0	1.6	1.8		0.6	0.7		
Delay (s)	36.2	5.4	5.0	116.2	13.6	8.9	36.0	36.3		30.5	30.6		
Level of Service	D	A	A	F	B	A	D	D		C	C		
Approach Delay (s)		20.5			14.5			36.2			30.6		
Approach LOS		C			B			D			C		
Intersection Summary													
HCM 2000 Control Delay			20.2									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			73.2									Sum of lost time (s)	16.0
Intersection Capacity Utilization			57.9%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis










2: Hollow Oak Drive & Bass Lake Road

Existing Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	67	0	12	0	200	31	8	713	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.76	0.76	0.76	0.82	0.82	0.82
Hourly flow rate (vph)	0	0	0	85	0	15	0	263	41	10	870	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1171	1197	874	1177	1177	288	872			306		
vC1, stage 1 conf vol	891	891		286	286							
vC2, stage 2 conf vol	280	306		891	891							
vCu, unblocked vol	1171	1197	874	1177	1177	288	872			306		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	73	100	98	100			99		
cM capacity (veh/h)	314	333	348	315	335	749	760			1253		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	100	0	304	10	870						
Volume Left	0	85	0	0	10	0						
Volume Right	0	15	0	41	0	0						
cSH	1700	346	1700	1700	1253	1700						
Volume to Capacity	0.00	0.29	0.00	0.18	0.01	0.51						
Queue Length 95th (ft)	0	29	0	0	1	0						
Control Delay (s)	0.0	19.6	0.0	0.0	7.9	0.0						
Lane LOS	A	C			A							
Approach Delay (s)	0.0	19.6	0.0		0.1							
Approach LOS	A	C										
Intersection Summary												
Average Delay				1.6								
Intersection Capacity Utilization			51.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Old Bass Lake Road & Bass Lake Road

Existing Conditions
 AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	2	4	229	789	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.76	0.76	0.83	0.83
Hourly flow rate (vph)	4	8	5	301	951	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1266	955	953			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1266	955	953			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	99			
cM capacity (veh/h)	184	312	708			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	12	307	951			
Volume Left	4	5	0			
Volume Right	8	0	0			
cSH	254	708	1700			
Volume to Capacity	0.05	0.01	0.56			
Queue Length 95th (ft)	4	1	0			
Control Delay (s)	19.9	0.3	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.9	0.3	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization		52.2%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
4: Country Club Drive & Bass Lake Road


















Existing Conditions
AM Peak Hour

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗		↘
Volume (veh/h)	187	74	159	124	133	658
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.79	0.79	0.72	0.72	0.83	0.83
Hourly flow rate (vph)	237	94	221	172	160	793
Pedestrians	2		2			2
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1338	225			395	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1338	225			395	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	88			86	
cM capacity (veh/h)	145	812			1162	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	330	221	172	953		
Volume Left	237	0	0	160		
Volume Right	94	0	172	0		
cSH	189	1700	1700	1162		
Volume to Capacity	1.75	0.13	0.10	0.14		
Queue Length 95th (ft)	576	0	0	12		
Control Delay (s)	400.7	0.0	0.0	3.3		
Lane LOS	F			A		
Approach Delay (s)	400.7	0.0		3.3		
Approach LOS	F					
Intersection Summary						
Average Delay			80.8			
Intersection Capacity Utilization			75.6%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: US 50 WB Ramps & Bass Lake Road
















Existing Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	7	0	94	21	189	0	0	133	712
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.61	0.61	0.61	0.82	0.82	0.82	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	11	0	154	26	230	0	0	149	800
Pedestrians	2			2			2			2		
Lane Width (ft)	0.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)						2						
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	435	435	153	435	435	234	151				232	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	435	435	153	435	435	234	151				232	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	98	100	81	98				100	
cM capacity (veh/h)	421	504	891	518	501	797	1423				1333	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2								
Volume Total	166	256	149	800								
Volume Left	11	26	0	0								
Volume Right	154	0	0	800								
cSH	856	1423	1700	1700								
Volume to Capacity	0.19	0.02	0.09	0.47								
Queue Length 95th (ft)	18	1	0	0								
Control Delay (s)	10.7	0.9	0.0	0.0								
Lane LOS	B	A										
Approach Delay (s)	10.7	0.9	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			69.5%		ICU Level of Service			C				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis










6: US 50 EB Ramps & Bass Lake Road

Existing Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	186	1	5	0	0	0	0	24	3	132	8	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.92	0.92	0.92	0.61	0.61	0.61	0.71	0.71	0.71
Hourly flow rate (vph)	251	1	7	0	0	0	0	39	5	186	11	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	429	431	15	436	429	46	13			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	429	431	15	436	429	46	13			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	48	100	99	100	100	100	100			88		
cM capacity (veh/h)	482	452	1055	476	456	1022	1590			1561		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	259	44	197									
Volume Left	251	0	186									
Volume Right	7	5	0									
cSH	489	1700	1561									
Volume to Capacity	0.53	0.03	0.12									
Queue Length 95th (ft)	77	0	10									
Control Delay (s)	20.4	0.0	7.2									
Lane LOS	C		A									
Approach Delay (s)	20.4	0.0	7.2									
Approach LOS	C											
Intersection Summary												
Average Delay			13.4									
Intersection Capacity Utilization			38.4%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: Marble Mountain Road & Marble Valley Road

Existing Conditions
 AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	19	2	0	8	5	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.40	0.40	0.60	0.60
Hourly flow rate (vph)	25	3	0	20	8	13
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	39	19	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39	19	24			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	100	100			
cM capacity (veh/h)	970	1056	1526			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	28	20	22			
Volume Left	25	0	0			
Volume Right	3	0	13			
cSH	977	1526	1700			
Volume to Capacity	0.03	0.00	0.01			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	8.8	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.8	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			14.6%	ICU Level of Service		A
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
8: Marble Valley Road & Marble Ridge Road

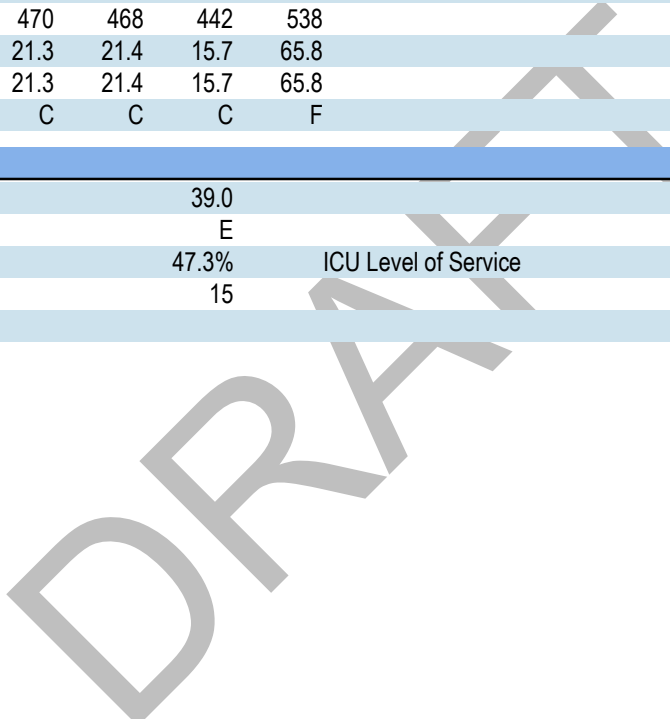
Existing Conditions
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	
Volume (veh/h)	1	6	0	0	8	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.42	0.92	0.92	0.40	0.40
Hourly flow rate (vph)	2	14	0	0	20	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			19		14	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			19		14	14
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1595		1002	1063
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	17	0	20			
Volume Left	0	0	20			
Volume Right	14	0	0			
cSH	1700	1700	1002			
Volume to Capacity	0.01	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	8.7			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	8.7			
Approach LOS				A		
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization			14.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Country Club Drive & Cambridge Road


















Existing Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	69	66	29	88	66	13	12	103	35	15	350	91
Peak Hour Factor	0.56	0.56	0.56	0.58	0.58	0.58	0.78	0.78	0.78	0.83	0.83	0.83
Hourly flow rate (vph)	123	118	52	152	114	22	15	132	45	18	422	110
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	293	288	192	549								
Volume Left (vph)	123	152	15	18								
Volume Right (vph)	52	22	45	110								
Hadj (s)	0.01	0.09	-0.09	-0.08								
Departure Headway (s)	7.5	7.6	7.6	6.6								
Degree Utilization, x	0.61	0.60	0.41	1.01								
Capacity (veh/h)	470	468	442	538								
Control Delay (s)	21.3	21.4	15.7	65.8								
Approach Delay (s)	21.3	21.4	15.7	65.8								
Approach LOS	C	C	C	F								
Intersection Summary												
Delay			39.0									
HCM Level of Service			E									
Intersection Capacity Utilization			47.3%	ICU Level of Service	A							
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis
 10: Knollwood Drive & Cambridge Road

Existing Conditions
 AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	5	0	235	2	0	0	119	145	2	1	459	7	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.80	0.80	0.80	0.50	0.50	0.50	0.81	0.81	0.81	0.83	0.83	0.83	
Hourly flow rate (vph)	6	0	294	4	0	0	147	179	2	1	553	8	
Pedestrians		2			2			2			2		
Lane Width (ft)		12.0			12.0			12.0			12.0		
Walking Speed (ft/s)		4.0			4.0			4.0			4.0		
Percent Blockage		0			0			0			0		
Right turn flare (veh)													
Median type								None			None		
Median storage (veh)													
Upstream signal (ft)								452					
pX, platoon unblocked	0.98	0.98		0.98	0.98	0.98				0.98			
vC, conflicting volume	1038	1039	561	1331	1042	184	563			183			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1030	1031	561	1329	1034	163	563			162			
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	97	100	44	92	100	100	85			100			
cM capacity (veh/h)	184	195	525	50	194	865	1006			1392			
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	300	4	328	563									
Volume Left	6	4	147	1									
Volume Right	294	0	2	8									
cSH	506	50	1006	1392									
Volume to Capacity	0.59	0.08	0.15	0.00									
Queue Length 95th (ft)	95	6	13	0									
Control Delay (s)	22.0	82.3	4.9	0.0									
Lane LOS	C	F	A	A									
Approach Delay (s)	22.0	82.3	4.9	0.0									
Approach LOS	C	F											
Intersection Summary													
Average Delay			7.2										
Intersection Capacity Utilization			63.9%		ICU Level of Service					B			
Analysis Period (min)			15										

HCM Signalized Intersection Capacity Analysis
 11: Merrychase Drive & Cambridge Road











Existing Conditions
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	184	215	25	270	141	118	91	51	335	249	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1		4.1	3.5	3.5	4.4	4.4	3.5	4.4	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	0.97		1.00	0.99	1.00	1.00	0.98	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	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected		0.99	1.00		1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844	1542		1855	1560	1770	1863	1544	1770	1772	
Flt Permitted		0.99	1.00		1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844	1542		1855	1560	1770	1863	1544	1770	1772	
Peak-hour factor, PHF	0.72	0.72	0.72	0.66	0.66	0.66	0.71	0.71	0.71	0.96	0.96	0.96
Adj. Flow (vph)	65	256	299	38	409	214	166	128	72	349	259	100
RTOR Reduction (vph)	0	0	249	0	0	112	0	0	59	0	14	0
Lane Group Flow (vph)	0	321	50	0	447	102	166	128	13	349	345	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Turn Type	Split		Perm	Split		pm+ov	Prot		Perm	Prot		
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)		15.3	15.3		26.0	43.9	12.0	17.1	17.1	17.9	23.0	
Effective Green, g (s)		15.3	15.3		26.0	43.9	12.0	17.1	17.1	17.9	23.0	
Actuated g/C Ratio		0.17	0.17		0.28	0.48	0.13	0.19	0.19	0.19	0.25	
Clearance Time (s)		4.1	4.1		4.1	3.5	3.5	4.4	4.4	3.5	4.4	
Vehicle Extension (s)		1.7	1.7		1.7	1.5	1.5	1.7	1.7	1.5	1.7	
Lane Grp Cap (vph)		305	255		522	741	230	345	286	343	441	
v/s Ratio Prot		c0.17			c0.24	0.03	0.09	0.07		c0.20	c0.19	
v/s Ratio Perm			0.03			0.04			0.01			
v/c Ratio		1.05	0.19		0.86	0.14	0.72	0.37	0.05	1.02	0.78	
Uniform Delay, d1		38.6	33.2		31.4	13.6	38.6	32.9	30.9	37.2	32.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		66.0	0.1		12.6	0.0	9.1	0.2	0.0	53.1	8.2	
Delay (s)		104.5	33.4		44.0	13.6	47.7	33.2	31.0	90.4	40.5	
Level of Service		F	C		D	B	D	C	C	F	D	
Approach Delay (s)		70.2			34.2			39.3			65.1	
Approach LOS		E			C			D			E	
Intersection Summary												
HCM Average Control Delay			53.8				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			92.4				Sum of lost time (s)			11.7		
Intersection Capacity Utilization			67.4%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group


















HCM Unsignalized Intersection Capacity Analysis
 12: US 50 EB Ramps & Cambridge Road

Existing Conditions
 AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	131	16	15	129	81	408
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.80	0.80	0.92	0.92
Hourly flow rate (vph)	144	18	19	161	88	443
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)	4					
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						783
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	513	314	90			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	447	235	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	73	98	99			
cM capacity (veh/h)	525	752	1519			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	162	180	532			
Volume Left	144	19	0			
Volume Right	18	0	443			
cSH	590	1519	1700			
Volume to Capacity	0.27	0.01	0.31			
Queue Length 95th (ft)	28	1	0			
Control Delay (s)	13.9	0.9	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.9	0.9	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization	43.9%		ICU Level of Service	A		
Analysis Period (min)	15					










HCM Unsignalized Intersection Capacity Analysis
 13: Crazy Horse Road & Cambridge Road

Existing Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	84	2	0	0	0	43	0	17	0	42	15	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.71	0.71	0.71	0.39	0.39	0.39	0.69	0.69	0.69
Hourly flow rate (vph)	125	3	0	0	0	61	0	44	0	61	22	58
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											1094	
pX, platoon unblocked												
vC, conflicting volume	252	191	26	193	249	48	82			46		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	252	191	26	193	249	48	82			46		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	100	100	100	100	94	100			96		
cM capacity (veh/h)	637	674	1047	737	626	1018	1513			1560		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	128	61	44	83	58							
Volume Left	125	0	0	61	0							
Volume Right	0	61	0	0	58							
cSH	637	1018	1513	1560	1700							
Volume to Capacity	0.20	0.06	0.00	0.04	0.03							
Queue Length 95th (ft)	19	5	0	3	0							
Control Delay (s)	12.1	8.8	0.0	5.5	0.0							
Lane LOS	B	A		A								
Approach Delay (s)	12.1	8.8	0.0	3.3								
Approach LOS	B	A										
Intersection Summary												
Average Delay			6.8									
Intersection Capacity Utilization			28.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 14: Deer Creek Road & Flying C Road

Existing Conditions
 AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	17	15	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	18	16	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	39	20	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39	20	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	970	1054	1596			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	18	16			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1596	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		14.6%		ICU Level of Service		A
Analysis Period (min)			15			

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
AM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	489	490	100.1%	48.6	1.7	D
	Through	541	537	99.2%	17.4	1.5	B
	Right Turn	123	122	99.0%	9.5	1.3	A
	Subtotal	1,153	1,148	99.6%	29.8	1.3	C
SB	Left Turn	50	47	94.1%	76.1	5.0	E
	Through	815	795	97.6%	37.0	2.2	D
	Right Turn	662	648	97.8%	29.1	6.2	C
	Subtotal	1,527	1,490	97.6%	34.8	3.8	C
EB	Left Turn	120	118	98.2%	44.4	2.2	D
	Through	52	50	95.3%	49.2	4.5	D
	Right Turn	366	370	101.2%	3.0	0.2	A
	Subtotal	538	538	100.0%	16.3	1.1	B
WB	Left Turn	92	95	103.3%	57.0	2.8	E
	Through	75	75	100.1%	57.9	5.0	E
	Right Turn	39	41	104.9%	9.1	3.9	A
	Subtotal	206	211	102.4%	48.1	2.7	D
Total		3,424	3,387	98.9%	31.0	1.7	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
AM Peak Hour

Intersection 16





















Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	866	845	97.6%	9.1	0.8	A
	Right Turn	146	148	101.3%	8.5	1.0	A
	Subtotal	1,012	993	98.2%	9.0	0.8	A
SB	Left Turn	192	197	102.9%	45.0	1.6	D
	Through	1,083	1,086	100.3%	15.9	0.7	B
	Right Turn						
	Subtotal	1,275	1,284	100.7%	20.4	0.6	C
EB	Left Turn						
	Through						
	Right Turn	1,073	1,033	96.3%	78.4	20.6	E
	Subtotal	1,073	1,033	96.3%	78.4	20.6	E
WB	Left Turn						
	Through						
	Right Turn	287	288	100.2%	9.3	0.3	A
	Subtotal	287	288	100.2%	9.3	0.3	A
Total		3,647	3,598	98.6%	33.0	6.1	C

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US 50 WB Ramps

Existing Conditions
 AM Peak Hour













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	394	0	102	58	331	0	0	272	431
Future Volume (veh/h)	0	0	0	394	0	102	58	331	0	0	272	431
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	0	0	1881	1881
Adj Flow Rate, veh/h				453	0	17	75	430	0	0	292	80
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.87	0.87	0.87	0.77	0.77	0.77	0.93	0.93	0.93
Percent Heavy Veh, %				2	2	2	2	2	0	0	1	1
Cap, veh/h				760	0	339	206	1577	0	0	772	345
Arrive On Green				0.21	0.00	0.21	0.12	0.45	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3548	0	1583	1774	3632	0	0	3668	1599
Grp Volume(v), veh/h				453	0	17	75	430	0	0	292	80
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1770	0	0	1787	1599
Q Serve(g_s), s				4.3	0.0	0.3	1.4	2.8	0.0	0.0	2.6	1.5
Cycle Q Clear(g_c), s				4.3	0.0	0.3	1.4	2.8	0.0	0.0	2.6	1.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				760	0	339	206	1577	0	0	772	345
V/C Ratio(X)				0.60	0.00	0.05	0.36	0.27	0.00	0.00	0.38	0.23
Avail Cap(c_a), veh/h				2874	0	1282	1197	4778	0	0	4825	2159
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.1	0.0	11.6	15.1	6.5	0.0	0.0	12.4	12.0
Incr Delay (d2), s/veh				0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.1	0.0	0.1	0.7	1.4	0.0	0.0	1.3	0.7
LnGrp Delay(d),s/veh				13.4	0.0	11.6	15.5	6.5	0.0	0.0	12.5	12.1
LnGrp LOS				B		B	B	A			B	B
Approach Vol, veh/h					470			505			372	
Approach Delay, s/veh					13.3			7.9			12.4	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		23.3			8.5	14.8		13.7				
Change Period (Y+Rc), s		6.8			* 4.2	6.8		5.8				
Max Green Setting (Gmax), s		50.0			* 25	50.0		30.0				
Max Q Clear Time (g_c+I1), s		4.8			3.4	4.6		6.3				
Green Ext Time (p_c), s		1.5			0.1	1.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				11.0								
HCM 2010 LOS				B								
Notes												

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US 50 EB Ramps

Existing Conditions
 AM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	79	19	119	310	547	119		
Future Volume (veh/h)	79	19	119	310	547	119		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1810	1810	1881	1881	1863	1863		
Adj Flow Rate, veh/h	84	1	159	413	629	29		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.94	0.94	0.75	0.75	0.87	0.87		
Percent Heavy Veh, %	5	5	1	1	2	2		
Cap, veh/h	428	191	590	1961	955	427		
Arrive On Green	0.12	0.12	0.17	0.55	0.27	0.27		
Sat Flow, veh/h	3447	1538	3476	3668	3632	1583		
Grp Volume(v), veh/h	84	1	159	413	629	29		
Grp Sat Flow(s),veh/h/ln	1723	1538	1738	1787	1770	1583		
Q Serve(g_s), s	0.8	0.0	1.5	2.3	6.1	0.5		
Cycle Q Clear(g_c), s	0.8	0.0	1.5	2.3	6.1	0.5		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	428	191	590	1961	955	427		
V/C Ratio(X)	0.20	0.01	0.27	0.21	0.66	0.07		
Avail Cap(c_a), veh/h	2238	999	2708	4641	4596	2056		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	15.1	14.8	13.9	4.4	12.5	10.5		
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.0	0.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.7	1.1	3.0	0.2		
LnGrp Delay(d),s/veh	15.2	14.8	14.0	4.5	12.8	10.5		
LnGrp LOS	B	B	B	A	B	B		
Approach Vol, veh/h	85			572	658			
Approach Delay, s/veh	15.2			7.1	12.7			
Approach LOS	B			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		27.9		10.6	10.7	17.2		
Change Period (Y+Rc), s		6.8		5.8	* 4.2	6.8		
Max Green Setting (Gmax), s		50.0		25.0	* 30	50.0		
Max Q Clear Time (g_c+I1), s		4.3		2.8	3.5	8.1		
Green Ext Time (p_c), s		2.3		0.1	0.3	2.3		
Intersection Summary								
HCM 2010 Ctrl Delay			10.4					
HCM 2010 LOS			B					
Notes								

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
AM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	94	96	102.1%	42.0	4.1	D
	Through	583	578	99.1%	10.4	0.6	B
	Right Turn	27	31	114.8%	5.8	1.2	A
	Subtotal	704	705	100.1%	14.5	0.9	B
SB	Left Turn	123	117	95.2%	45.0	3.4	D
	Through	1,397	1,383	99.0%	17.6	2.1	B
	Right Turn	28	27	95.0%	16.1	3.6	B
	Subtotal	1,548	1,526	98.6%	19.7	2.0	B
EB	Left Turn	30	30	101.4%	37.4	3.8	D
	Through	17	17	97.7%	35.1	5.1	D
	Right Turn	116	116	100.3%	19.5	1.4	B
	Subtotal	163	163	100.2%	24.4	1.9	C
WB	Left Turn	14	12	83.7%	34.1	5.6	C
	Through	10	10	99.8%	41.5	7.6	D
	Right Turn	46	47	101.8%	8.3	1.5	A
	Subtotal	70	69	97.9%	17.7	3.4	B
Total		2,485	2,463	99.1%	18.5	1.5	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
AM Peak Hour

Intersection 21

Latrobe Rd/Town Center Blvd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	61	57	93.6%	37.0	4.4	D
	Through	749	744	99.3%	16.9	0.8	B
	Right Turn	58	55	95.5%	4.9	1.0	A
	Subtotal	868	856	98.7%	17.4	0.9	B
SB	Left Turn	435	429	98.5%	35.3	1.9	D
	Through	1,428	1,406	98.4%	11.7	1.1	B
	Right Turn	293	279	95.4%	4.8	0.3	A
	Subtotal	2,156	2,114	98.0%	15.6	1.1	B
EB	Left Turn	10	11	112.3%	39.5	7.2	D
	Through	5	6	122.9%	34.6	11.1	C
	Right Turn	8	8	99.6%	17.5	5.5	B
	Subtotal	23	25	110.2%	31.7	6.3	C
WB	Left Turn	62	61	98.2%	28.6	2.9	C
	Through	28	27	95.0%	28.3	4.2	C
	Right Turn	244	241	98.7%	11.3	0.6	B
	Subtotal	334	328	98.3%	15.9	1.0	B
Total		3,381	3,324	98.3%	16.2	0.9	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement























Marble Valley EIR
Existing Conditions
AM Peak Hour

Intersection 22 Latrobe Rd/White Rock Rd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	73	71	96.8%	58.9	6.0	E
	Through	496	494	99.7%	22.1	0.9	C
	Right Turn	147	148	100.4%	6.1	0.9	A
	Subtotal	716	713	99.5%	22.4	0.9	C
SB	Left Turn	111	109	98.6%	62.9	3.2	E
	Through	1,046	1,038	99.2%	21.9	1.8	C
	Right Turn	342	334	97.6%	11.7	0.9	B
	Subtotal	1,499	1,481	98.8%	22.6	1.6	C
EB	Left Turn	218	215	98.6%	53.1	3.2	D
	Through	99	99	99.6%	53.6	5.0	D
	Right Turn	42	43	101.5%	25.9	4.3	C
	Subtotal	359	356	99.2%	50.0	2.7	D
WB	Left Turn	321	299	93.1%	58.0	1.9	E
	Through	252	240	95.2%	59.1	1.9	E
	Right Turn	154	145	94.1%	6.3	0.8	A
	Subtotal	727	683	94.0%	47.4	1.4	D
Total		3,301	3,233	97.9%	30.8	0.8	C

HCM Signalized Intersection Capacity Analysis
 1: Bass Lake Road & Serrano Parkway

Existing Conditions
 PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	147	394	10	10	213	54	10	10	10	111	10	105	
Future Volume (vph)	147	394	10	10	213	54	10	10	10	111	10	105	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00		1.00	0.98		
Flpb, ped/bikes	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	0.93		1.00	0.86		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1548	1770	1723		1770	1576		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1548	1770	1723		1770	1576		
Peak-hour factor, PHF	0.96	0.96	0.92	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	153	410	11	11	227	57	11	11	11	121	11	114	
RTOR Reduction (vph)	0	0	6	0	0	42	0	10	0	0	95	0	
Lane Group Flow (vph)	153	410	5	11	227	15	11	12	0	121	30	0	
Confl. Peds. (#/hr)	2					2				2		2	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	5	2		1	6		8	8		4	4		
Permitted Phases			2			6							
Actuated Green, G (s)	11.3	26.8	26.8	0.6	16.1	16.1	6.2	6.2		9.9	9.9		
Effective Green, g (s)	11.3	26.8	26.8	0.6	16.1	16.1	6.2	6.2		9.9	9.9		
Actuated g/C Ratio	0.19	0.45	0.45	0.01	0.27	0.27	0.10	0.10		0.17	0.17		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	336	839	713	17	504	418	184	179		294	262		
v/s Ratio Prot	c0.09	c0.22		0.01	0.12		0.01	c0.01		c0.07	0.02		
v/s Ratio Perm			0.00			0.01							
v/c Ratio	0.46	0.49	0.01	0.65	0.45	0.04	0.06	0.07		0.41	0.11		
Uniform Delay, d1	21.4	11.5	9.0	29.3	18.0	16.0	24.0	24.0		22.2	21.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.0	0.5	0.0	62.0	0.6	0.0	0.1	0.2		0.9	0.2		
Delay (s)	22.4	12.0	9.0	91.3	18.7	16.0	24.2	24.2		23.1	21.3		
Level of Service	C	B	A	F	B	B	C	C		C	C		
Approach Delay (s)		14.7			20.9			24.2			22.2		
Approach LOS		B			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			18.2		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			59.5		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			47.8%		ICU Level of Service					A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis

2: Driveway & Bass Lake Road










Existing Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	1	18	0	6	0	549	40	6	308	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.96	0.96	0.96	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	1	24	0	8	0	572	42	6	318	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	914	947	322	928	927	597	320			616		
vC1, stage 1 conf vol	332	332		595	595							
vC2, stage 2 conf vol	582	616		333	332							
vCu, unblocked vol	914	947	322	928	927	597	320			616		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	98	100			99		
cM capacity (veh/h)	435	428	717	437	439	501	1238			963		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	1	32	0	614	6	318						
Volume Left	0	24	0	0	6	0						
Volume Right	1	8	0	42	0	0						
cSH	717	452	1700	1700	963	1700						
Volume to Capacity	0.00	0.07	0.00	0.36	0.01	0.19						
Queue Length 95th (ft)	0	6	0	0	0	0						
Control Delay (s)	10.0	13.6	0.0	0.0	8.8	0.0						
Lane LOS	B	B			A							
Approach Delay (s)	10.0	13.6	0.0		0.2							
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			46.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Old Bass Lake Road & Bass Lake Road

Existing Conditions
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	3	2	600	332	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	0.93	0.93	0.97	0.97
Hourly flow rate (vph)	1	3	2	645	342	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	996	346	344			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	996	346	344			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	270	694	1213			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	4	647	342			
Volume Left	1	2	0			
Volume Right	3	0	0			
cSH	498	1213	1700			
Volume to Capacity	0.01	0.00	0.20			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	12.3	0.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.3	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization		43.8%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
4: Country Club Drive & Bass Lake Road


















Existing Conditions
PM Peak Hour

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗		↘
Volume (veh/h)	57	43	559	163	47	288
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	66	50	582	170	49	300
Pedestrians	2		2			2
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	984	586			754	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	984	586			754	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	90			94	
cM capacity (veh/h)	259	508			855	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	116	582	170	349		
Volume Left	66	0	0	49		
Volume Right	50	0	170	0		
cSH	328	1700	1700	855		
Volume to Capacity	0.35	0.34	0.10	0.06		
Queue Length 95th (ft)	39	0	0	5		
Control Delay (s)	21.9	0.0	0.0	1.9		
Lane LOS	C			A		
Approach Delay (s)	21.9	0.0		1.9		
Approach LOS	C					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			63.5%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: US 50 WB Ramps & Bass Lake Road
















Existing Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	7	1	124	12	598	0	0	100	245
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.77	0.77	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	9	1	161	12	623	0	0	104	255
Pedestrians		2			2			2			2	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	757	756	108	756	756	627	106			625		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	757	756	108	756	756	627	106			625		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	67	99			100		
cM capacity (veh/h)	213	334	944	321	334	482	1485			955		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2								
Volume Total	171	635	104	255								
Volume Left	9	12	0	0								
Volume Right	161	0	0	255								
cSH	513	1485	1700	1700								
Volume to Capacity	0.33	0.01	0.06	0.15								
Queue Length 95th (ft)	36	1	0	0								
Control Delay (s)	16.2	0.2	0.0	0.0								
Lane LOS	C	A										
Approach Delay (s)	16.2	0.2	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			61.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis










6: US 50 EB Ramps & Bass Lake Road

Existing Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	598	2	18	0	0	0	0	12	3	99	8	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.92	0.92	0.92	0.63	0.63	0.63	0.83	0.83	0.83
Hourly flow rate (vph)	616	2	19	0	0	0	0	19	5	119	10	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	274	276	14	293	274	25	12			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274	276	14	293	274	25	12			26		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	3	100	98	100	100	100	100			92		
cM capacity (veh/h)	637	583	1063	607	585	1049	1605			1588		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	637	24	129									
Volume Left	616	0	119									
Volume Right	19	5	0									
cSH	644	1700	1588									
Volume to Capacity	0.99	0.01	0.08									
Queue Length 95th (ft)	375	0	6									
Control Delay (s)	58.0	0.0	6.9									
Lane LOS	F		A									
Approach Delay (s)	58.0	0.0	6.9									
Approach LOS	F											
Intersection Summary												
Average Delay			47.9									
Intersection Capacity Utilization			60.3%			ICU Level of Service				B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
7: Marble Mountain Road & Marble Valley Road

Existing Conditions
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	8	0	0	7	7	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.40	0.40	0.58	0.58	0.72	0.72
Hourly flow rate (vph)	20	0	0	12	10	26
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	39	27	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39	27	38			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	945	1017	1570			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	20	12	36			
Volume Left	20	0	0			
Volume Right	0	0	26			
cSH	945	1570	1700			
Volume to Capacity	0.02	0.00	0.02			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	8.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.9	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization		14.6%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Marble Valley Road & Marble Ridge Road

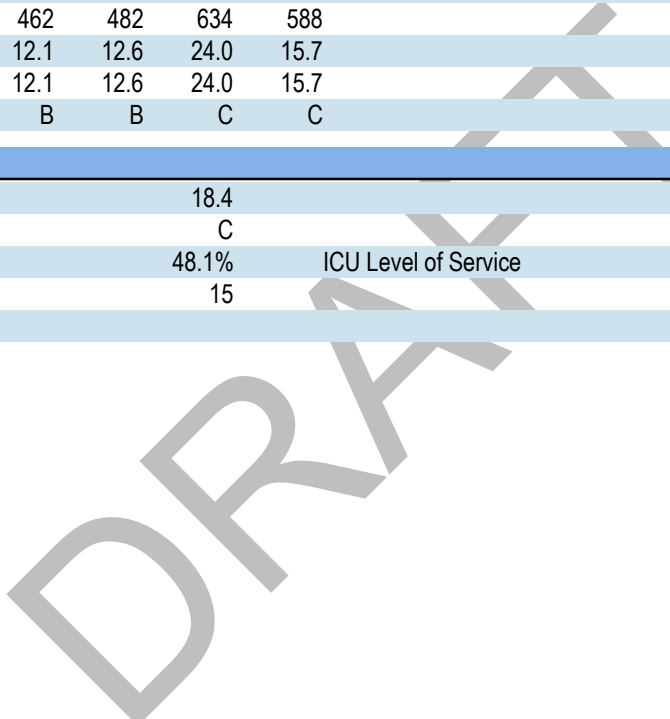
Existing Conditions
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	
Volume (veh/h)	0	7	0	0	7	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.92	0.92	0.58	0.58
Hourly flow rate (vph)	0	12	0	0	12	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			14		10	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			14		10	10
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1601		1007	1068
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	12	0	12			
Volume Left	0	0	12			
Volume Right	12	0	0			
cSH	1700	1700	1007			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.0	8.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			14.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Country Club Drive & Cambridge Road

Existing Conditions
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	61	37	19	37	69	33	17	360	97	24	208	78
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.95	0.95	0.95	0.88	0.88	0.88
Hourly flow rate (vph)	71	43	22	46	85	41	18	379	102	27	236	89
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	136	172	499	352								
Volume Left (vph)	71	46	18	27								
Volume Right (vph)	22	41	102	89								
Hadj (s)	0.04	-0.06	-0.08	-0.10								
Departure Headway (s)	6.8	6.6	5.5	5.7								
Degree Utilization, x	0.26	0.31	0.76	0.56								
Capacity (veh/h)	462	482	634	588								
Control Delay (s)	12.1	12.6	24.0	15.7								
Approach Delay (s)	12.1	12.6	24.0	15.7								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay			18.4									
HCM Level of Service			C									
Intersection Capacity Utilization			48.1%	ICU Level of Service	A							
Analysis Period (min)			15									

























HCM Unsignalized Intersection Capacity Analysis
 10: Knollwood Drive & Cambridge Road

Existing Conditions
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	122	4	3	2	193	465	0	2	253	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.90	0.90	0.90	0.91	0.91	0.91
Hourly flow rate (vph)	8	0	133	5	4	3	214	517	0	2	278	10
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	1242	1237	287	1370	1242	521	290			519		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1177	1171	287	1337	1177	274	290			272		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	82	93	97	100	83			100		
cM capacity (veh/h)	113	127	750	74	126	609	1270			1030		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	140	12	731	290								
Volume Left	8	5	214	2								
Volume Right	133	3	0	10								
cSH	574	111	1270	1030								
Volume to Capacity	0.24	0.11	0.17	0.00								
Queue Length 95th (ft)	24	9	15	0								
Control Delay (s)	13.3	41.3	3.9	0.1								
Lane LOS	B	E	A	A								
Approach Delay (s)	13.3	41.3	3.9	0.1								
Approach LOS	B	E										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			67.7%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 11: Merrychase Drive & Cambridge Road











Existing Conditions
 PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	64	76	171	39	205	204	151	364	33	129	168	64	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.1	4.1		4.1	3.0	3.0	4.4	4.4	3.0	4.4		
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frbp, ped/bikes		1.00	0.97		1.00	0.99	1.00	1.00	0.98	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		
Frft		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.96		
Flt Protected		0.98	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1821	1541		1848	1561	1770	1863	1546	1770	1774		
Flt Permitted		0.98	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)		1821	1541		1848	1561	1770	1863	1546	1770	1774		
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90	
Adj. Flow (vph)	73	86	194	44	230	229	166	400	36	143	187	71	
RTOR Reduction (vph)	0	0	165	0	0	146	0	0	15	0	13	0	
Lane Group Flow (vph)	0	159	29	0	274	83	166	400	21	143	245	0	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2	
Turn Type	Split		Perm	Split		pm+ov	Prot		Perm	Prot			
Protected Phases	4	4		8	8	1	5	2		1	6		
Permitted Phases			4			8			2				
Actuated Green, G (s)		11.1	11.1		16.6	27.5	11.5	21.3	21.3	10.9	20.7		
Effective Green, g (s)		11.1	11.1		16.6	27.5	11.5	21.3	21.3	10.9	20.7		
Actuated g/C Ratio		0.15	0.15		0.22	0.36	0.15	0.28	0.28	0.14	0.27		
Clearance Time (s)		4.1	4.1		4.1	3.0	3.0	4.4	4.4	3.0	4.4		
Vehicle Extension (s)		1.7	1.7		1.7	1.5	1.5	1.7	1.7	1.5	1.7		
Lane Grp Cap (vph)		268	227		406	569	270	526	436	256	486		
v/s Ratio Prot		c0.09			c0.15	0.02	c0.09	c0.21		0.08	0.14		
v/s Ratio Perm			0.02			0.03			0.01				
v/c Ratio		0.59	0.13		0.67	0.15	0.61	0.76	0.05	0.56	0.50		
Uniform Delay, d1		30.1	28.0		27.0	16.1	29.9	24.8	19.7	30.1	23.1		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		2.3	0.1		3.5	0.0	2.9	5.8	0.0	1.5	0.3		
Delay (s)		32.4	28.1		30.4	16.2	32.8	30.5	19.7	31.6	23.4		
Level of Service		C	C		C	B	C	C	B	C	C		
Approach Delay (s)		30.0			23.9			30.5			26.3		
Approach LOS		C			C			C			C		
Intersection Summary													
HCM Average Control Delay			27.7		HCM Level of Service					C			
HCM Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			75.5		Sum of lost time (s)					11.2			
Intersection Capacity Utilization			61.2%		ICU Level of Service					B			
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 12: US 50 EB Ramps & Cambridge Road

Existing Conditions
 PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	445	78	35	103	95	283
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	484	85	38	112	103	308
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)		4				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					783	
pX, platoon unblocked						
vC, conflicting volume	449	261	105			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	449	261	105			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	12	89	97			
cM capacity (veh/h)	551	775	1484			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	568	150	411			
Volume Left	484	38	0			
Volume Right	85	0	308			
cSH	617	1484	1700			
Volume to Capacity	0.92	0.03	0.24			
Queue Length 95th (ft)	297	2	0			
Control Delay (s)	45.4	2.1	0.0			
Lane LOS	E	A				
Approach Delay (s)	45.4	2.1	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			23.1			
Intersection Capacity Utilization			64.6%	ICU Level of Service		C
Analysis Period (min)			15			










HCM Unsignalized Intersection Capacity Analysis
 13: Crazy Horse Road & Cambridge Road

Existing Conditions
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	58	0	0	0	1	56	0	24	2	55	19	99
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.71	0.71	0.71	0.93	0.93	0.93	0.96	0.96	0.96
Hourly flow rate (vph)	73	0	0	0	1	79	0	26	2	57	20	103
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											1094	
pX, platoon unblocked												
vC, conflicting volume	245	166	24	165	268	31	125			30		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245	166	24	165	268	31	125			30		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	100	100	100	92	100			96		
cM capacity (veh/h)	632	698	1049	773	613	1040	1459			1580		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	73	80	28	77	103							
Volume Left	73	0	0	57	0							
Volume Right	0	79	2	0	103							
cSH	632	1027	1459	1580	1700							
Volume to Capacity	0.12	0.08	0.00	0.04	0.06							
Queue Length 95th (ft)	10	6	0	3	0							
Control Delay (s)	11.4	8.8	0.0	5.5	0.0							
Lane LOS	B	A		A								
Approach Delay (s)	11.4	8.8	0.0	2.4								
Approach LOS	B	A										
Intersection Summary												
Average Delay				5.5								
Intersection Capacity Utilization			27.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 14: Deer Creek Road & Flying C Road

Existing Conditions
 PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	26	19	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	28	21	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	53	25	23			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53	25	23			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	952	1048	1590			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	28	21			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1590	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			14.6%	ICU Level of Service		A
Analysis Period (min)			15			

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
PM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	994	953	95.9%	49.4	3.1	D
	Through	1,221	1,162	95.2%	19.2	0.9	B
	Right Turn	279	267	95.8%	15.9	1.5	B
	Subtotal	2,494	2,382	95.5%	30.9	1.7	C
SB	Left Turn	38	39	102.1%	77.9	8.7	E
	Through	537	501	93.2%	43.0	3.1	D
	Right Turn	330	326	98.7%	25.7	1.5	C
	Subtotal	905	865	95.6%	38.1	1.9	D
EB	Left Turn	125	121	97.1%	51.3	2.4	D
	Through	58	55	95.3%	54.5	7.2	D
	Right Turn	172	168	97.5%	2.5	0.5	A
	Subtotal	355	344	97.0%	28.0	2.6	C
WB	Left Turn	167	164	98.2%	58.9	2.6	E
	Through	60	58	97.1%	56.6	5.0	E
	Right Turn	74	72	96.8%	9.1	1.6	A
	Subtotal	301	294	97.7%	46.3	1.5	D
Total		4,055	3,885	95.8%	33.4	1.4	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
PM Peak Hour

Intersection 16




















Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	1,747	1,641	93.9%	20.9	2.7	C
	Right Turn	455	422	92.7%	27.9	4.4	C
	Subtotal	2,202	2,063	93.7%	22.4	3.0	C
SB	Left Turn	194	185	95.5%	42.9	1.3	D
	Through	683	651	95.3%	8.8	0.5	A
	Right Turn						
	Subtotal	877	836	95.4%	16.4	0.9	B
EB	Left Turn						
	Through						
	Right Turn	705	675	95.8%	24.8	3.2	C
	Subtotal	705	675	95.8%	24.8	3.2	C
WB	Left Turn						
	Through						
	Right Turn	746	717	96.1%	14.7	0.5	B
	Subtotal	746	717	96.1%	14.7	0.5	B
Total		4,530	4,291	94.7%	20.3	1.5	C

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US 50 WB Ramps

Existing Conditions
 PM Peak Hour













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	250	0	151	52	890	0	0	187	170
Future Volume (veh/h)	0	0	0	250	0	151	52	890	0	0	187	170
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				278	0	32	56	957	0	0	215	24
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.90	0.90	0.90	0.93	0.93	0.93	0.87	0.87	0.87
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				771	0	344	173	1573	0	0	805	360
Arrive On Green				0.21	0.00	0.21	0.10	0.44	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3619	0	1615	1810	3705	0	0	3705	1615
Grp Volume(v), veh/h				278	0	32	56	957	0	0	215	24
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1805	1615
Q Serve(g_s), s				2.3	0.0	0.6	1.0	7.3	0.0	0.0	1.8	0.4
Cycle Q Clear(g_c), s				2.3	0.0	0.6	1.0	7.3	0.0	0.0	1.8	0.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				771	0	344	173	1573	0	0	805	360
V/C Ratio(X)				0.36	0.00	0.09	0.32	0.61	0.00	0.00	0.27	0.07
Avail Cap(c_a), veh/h				3028	0	1351	1262	5034	0	0	5034	2252
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				12.0	0.0	11.3	15.1	7.8	0.0	0.0	11.5	11.0
Incr Delay (d2), s/veh				0.1	0.0	0.0	0.4	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.2	0.0	0.3	0.5	3.6	0.0	0.0	0.9	0.2
LnGrp Delay(d),s/veh				12.1	0.0	11.4	15.5	7.9	0.0	0.0	11.6	11.0
LnGrp LOS				B		B	B	A			B	B
Approach Vol, veh/h					310			1013			239	
Approach Delay, s/veh					12.1			8.3			11.5	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		22.4			7.6	14.8		13.4				
Change Period (Y+Rc), s		6.8			* 4.2	6.8		5.8				
Max Green Setting (Gmax), s		50.0			* 25	50.0		30.0				
Max Q Clear Time (g_c+I1), s		9.3			3.0	3.8		4.3				
Green Ext Time (p_c), s		2.7			0.0	2.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				9.6								
HCM 2010 LOS				A								
Notes												

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US 50 EB Ramps

Existing Conditions
 PM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	433	46	308	509	350	87		
Future Volume (veh/h)	433	46	308	509	350	87		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900		
Adj Flow Rate, veh/h	487	10	335	553	368	15		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.89	0.89	0.92	0.92	0.95	0.95		
Percent Heavy Veh, %	0	0	0	0	0	0		
Cap, veh/h	699	312	660	1822	779	349		
Arrive On Green	0.19	0.19	0.19	0.50	0.22	0.22		
Sat Flow, veh/h	3619	1615	3510	3705	3705	1615		
Grp Volume(v), veh/h	487	10	335	553	368	15		
Grp Sat Flow(s),veh/h/ln	1810	1615	1755	1805	1805	1615		
Q Serve(g_s), s	5.2	0.2	3.6	3.7	3.7	0.3		
Cycle Q Clear(g_c), s	5.2	0.2	3.6	3.7	3.7	0.3		
Prop In Lane	1.00	1.00	1.00				1.00	
Lane Grp Cap(c), veh/h	699	312	660	1822	779	349		
V/C Ratio(X)	0.70	0.03	0.51	0.30	0.47	0.04		
Avail Cap(c_a), veh/h	2171	969	2527	4330	4330	1937		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	15.7	13.7	15.2	6.0	14.3	12.9		
Incr Delay (d2), s/veh	0.5	0.0	0.2	0.0	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.6	0.2	1.7	1.9	1.9	0.1		
LnGrp Delay(d),s/veh	16.2	13.7	15.4	6.1	14.4	13.0		
LnGrp LOS	B	B	B	A	B	B		
Approach Vol, veh/h	497			888	383			
Approach Delay, s/veh	16.1			9.6	14.4			
Approach LOS	B			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		27.8		13.8	12.0	15.8		
Change Period (Y+Rc), s		6.8		5.8	* 4.2	6.8		
Max Green Setting (Gmax), s		50.0		25.0	* 30	50.0		
Max Q Clear Time (g_c+I1), s		5.7		7.2	5.6	5.7		
Green Ext Time (p_c), s		2.0		0.8	0.6	2.0		
Intersection Summary								
HCM 2010 Ctrl Delay			12.5					
HCM 2010 LOS			B					
Notes								

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
PM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	123	114	93.0%	45.2	3.1	D
	Through	1,228	1,180	96.1%	18.8	1.7	B
	Right Turn	69	68	98.1%	14.1	2.4	B
	Subtotal	1,420	1,362	95.9%	20.8	1.8	C
SB	Left Turn	139	135	97.4%	40.7	2.9	D
	Through	761	737	96.9%	16.4	1.1	B
	Right Turn	26	25	95.3%	11.8	2.7	B
	Subtotal	926	897	96.9%	20.0	1.4	B
EB	Left Turn	46	46	100.6%	40.1	3.9	D
	Through	22	22	98.2%	40.9	4.7	D
	Right Turn	85	82	96.2%	7.4	0.8	A
	Subtotal	153	150	97.8%	22.3	2.2	C
WB	Left Turn	55	50	90.8%	32.6	2.5	C
	Through	19	17	90.9%	34.3	8.8	C
	Right Turn	260	253	97.3%	15.4	1.6	B
	Subtotal	334	320	95.9%	19.1	1.5	B
Total		2,833	2,729	96.3%	20.4	1.2	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
PM Peak Hour

Intersection 21

Latrobe Rd/Town Center Blvd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	4	3	81.6%	75.8	18.8	E
	Through	1,323	1,251	94.6%	82.7	13.9	F
	Right Turn	79	78	99.2%	7.9	1.8	A
	Subtotal	1,406	1,333	94.8%	78.2	12.9	E
SB	Left Turn	478	459	96.0%	61.3	9.1	E
	Through	897	862	96.1%	16.7	2.1	B
	Right Turn	13	12	94.5%	2.4	0.6	A
	Subtotal	1,388	1,333	96.0%	32.0	4.6	C
EB	Left Turn	300	281	93.7%	64.0	11.3	E
	Through	24	23	96.0%	41.6	6.5	D
	Right Turn	89	88	98.8%	12.2	1.7	B
	Subtotal	413	392	95.0%	51.0	7.2	D
WB	Left Turn	63	60	94.6%	47.8	3.8	D
	Through	3	3	102.4%	49.1	24.0	D
	Right Turn	573	541	94.4%	24.1	1.5	C
	Subtotal	639	603	94.4%	26.6	1.4	C
Total		3,846	3,661	95.2%	50.0	5.4	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Conditions
PM Peak Hour

Intersection 22

Latrobe Rd/White Rock Rd

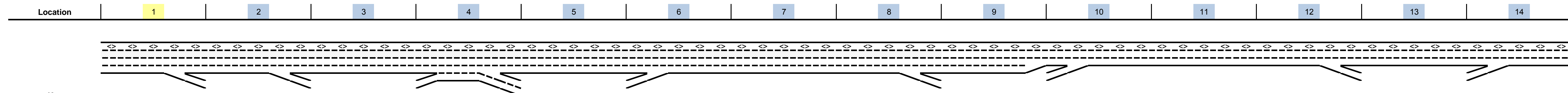
Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	63	61	97.4%	44.3	6.2	D
	Through	858	827	96.3%	28.6	1.9	C
	Right Turn	309	298	96.6%	14.1	1.7	B
	Subtotal	1,230	1,186	96.5%	25.8	1.6	C
SB	Left Turn	226	220	97.2%	41.8	1.9	D
	Through	597	574	96.1%	20.7	0.9	C
	Right Turn	225	216	96.2%	8.5	0.6	A
	Subtotal	1,048	1,010	96.4%	22.7	1.0	C
EB	Left Turn	350	334	95.6%	39.5	1.6	D
	Through	301	288	95.7%	32.0	1.7	C
	Right Turn	106	97	91.7%	20.2	2.7	C
	Subtotal	757	720	95.1%	33.9	1.2	C
WB	Left Turn	171	167	97.6%	37.8	2.1	D
	Through	146	139	95.5%	37.7	3.2	D
	Right Turn	195	190	97.5%	6.3	1.5	A
	Subtotal	512	496	97.0%	25.7	1.4	C
Total		3,547	3,412	96.2%	26.6	0.7	C

Existing Roadway Segments Analysis			Note: County Website Counts are the average of th			Peak Hour Volume			LOS Thresholds			V/ C Ratio		LOS	
Marble Valley EIR	Count Source	Number of Lanes	AM	PM	LOS C	LOS D	LOS E	AM	PM	AM	PM				
Bass Lake Rd - Green Valley Rd to US 50 (2 segments) - 4 extra															
	Green Valley Rd to Bridlewood Dr	County Website	2A	503	486	850	1540	1650	0.30	0.29	C or better	C or better			
	Bridlewood Dr to Serrano Pkwy	Intersection Counts	2A	726	772	850	1540	1650	0.44	0.47	C or better	C or better			
	Serrano Pkwy to Hollow Oak Dr	Intersection Counts	2A	933	869	850	1540	1650	0.57	0.53	D	D			
	Hollow Oak Dr to Country Club	Intersection Counts	2A	1023	928	850	1540	1650	0.62	0.56	D	D			
	Country Club Dr to US 50	Intersection Counts	2A	1128	1067	850	1540	1650	0.68	0.65	D	D			
Cambridge Rd - Green Valley to US 50 (4 segments)															
	Green Valley Rd to Oxford	County Website	2A	381	394	850	1540	1650	0.23	0.24	C or better	C or better			
	Oxford to Knollwood Dr	Intersection Counts	2A	641	764	850	1540	1650	0.39	0.46	C or better	C or better			
	Knollwood Dr to Country Club	Intersection Counts	2A	617	738	850	1540	1650	0.37	0.45	C or better	C or better			
	Country Club to US 50	Intersection Counts	2A	959	993	850	1540	1650	0.58	0.60	D	D			
Cameron Park Dr - Green Valley to US 50 (4 Segments)															
	Green Valley to Alhambra	County Website	2A	654	793	850	1540	1650	0.40	0.48	C or better	C or better			
	Alhambra to Oxford	County Website	2A	1211	1434	850	1540	1650	0.73	0.87	D	D			
	Oxford to Hacienda Dr	Roadway Counts	2A	1080	1612	850	1540	1650	0.65	0.98	D	E			
	Hacienda Dr to US 50	County Website	4AU	1084	1636	1760	3070	3130	0.35	0.52	C or better	C or better			
Country Club - Bass Lake to Cameron Park Dr (4 Segments)															
	Bass Lake to Merrychase Dr	Intersection Counts	2A	518	310	850	1540	1650	0.31	0.19	C or better	C or better			
	Merrychase Dr to Knollwood	County Website	2A	481	300	850	1540	1650	0.29	0.18	C or better	C or better			
	Knollwood to Cambridge	Intersection Counts	2A	338	281	850	1540	1650	0.20	0.17	C or better	C or better			
	Cambridge to Royal	Intersection Counts	2A	283	297	850	1540	1650	0.17	0.18	C or better	C or better			
	Royal to Cameron Park Dr	County Website	2A	215	362	850	1540	1650	0.13	0.22	C or better	C or better			
Durock Rd - US 50 to South Shingle (2 Segments)															
	US to to Business Dr	County Website	2A	319	556	850	1540	1650	0.19	0.34	C or better	C or better			
	Business Dr to S. Shingle	County Website	2A	322	547	850	1540	1650	0.20	0.33	C or better	C or better			

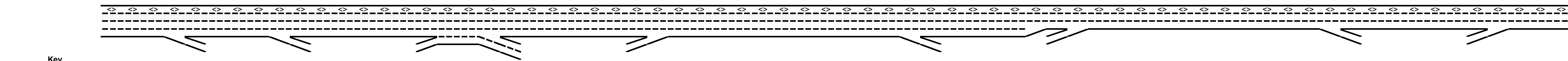
Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50
Alternative: Existing Conditions
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

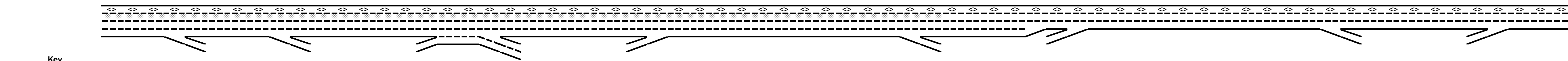


Key
 <-> Express Lane (HOV)
 No Trucks

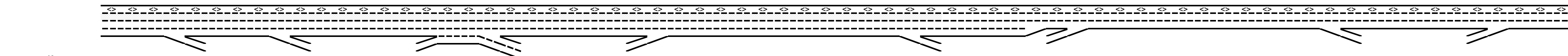
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Define Freeway Segment														
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge
Length (ft)	1,500	850	1,975	3,000	1,575	1,500	2,925	1,500	2,100	1,500	3,300	1,500	1,350	1,500
Accel Length						550				500				500
Decel Length	150	150						150				150		
Mainline Volume	2,560	1,487	1,200	1,200	1,440	1,440	1,678	1,678	1,486	1,486	1,622	1,622	1,475	1,475
On Ramp Volume				338		238				136				423
Off Ramp Volume	1,073	287		98				192				147		
Express Lane Volume	128	74	60	60	72	72	84	84	74	74	81	81	74	74
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,432	1,413	1,140	1,478	1,368	1,606	1,594	1,594	1,412	1,548	1,541	1,541	1,401	1,824
PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
GP Lanes	3	3	3	4	3	3	3	3	3	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	5.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.980	0.980	0.980	0.980	0.980	0.980	0.862	0.980	0.980	0.980	0.980	0.980	0.980	0.980
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	2,851	1,656	1,337	1,733	1,604	1,883	2,125	1,869	1,655	1,815	1,807	1,807	1,643	2,139
GP Flow (pcphpl)	950	552	446	433	535	628	708	623	552	907	903	903	821	1,069
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.40	0.23	0.19	0.18	0.23	0.27	0.30	0.27	0.23	0.39	0.38	0.38	0.35	0.46
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Density (pcphpl)	14.6	8.5	6.9	6.7	8.2	9.7	10.9	9.6	8.5	14.0	13.9	13.9	12.6	16.5
LOS	B	A	A	A	A	A	A	A	A	B	B	B	B	B
Calculate Operations for Entering GP Lanes														
GP _N Vol (pcph)				1,362		1,620				1,621				1,672
GP _N Cap (pcph)				7,050		7,050				4,700				4,700
GP _N v/c ratio				0.19		0.23				0.34				0.36
Calculate Operations for Exiting GP Lanes														
GP _{OUT} Vol (pcph)	1,673	1,341		1,626				1,607	1,655			1,643		
GP _{OUT} Cap (pcph)	7,050	7,050		7,050				7,050	4,700			4,700		
GP _{OUT} v/c ratio	0.24	0.19		0.23				0.23	0.35			0.35		



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	128	74	60	60	72	72	84	84	74	74	81	81	74	74
PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	166	96	78	78	93	93	117	109	96	96	105	105	95	95
EL Flow (pcphpl)	166	96	78	78	93	93	117	109	96	96	105	105	95	95
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{lw}														
f _{lc}														
Calc'd FFS														
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _{sv} v/c ratio	0.09	0.06	0.04	0.04	0.05	0.05	0.07	0.06	0.05	0.05	0.06	0.06	0.05	0.05
Calculate On Ramp Flow Rate														
On Volume (vph)				338		238					136			423
PHF				0.92		0.92					0.71			0.92
Total Lanes				1		1					1			1
Terrain				Level		Level					Level			Level
Grade %				0.0%		0.0%					0.0%			0.0%
Grade Length (mi)				0.00		0.00					0.00			0.00
Truck & Bus %				2.0%		3.0%					2.0%			3.0%
RV %				0.0%		0.0%					0.0%			0.0%
E _T				1.5		1.5					1.5			1.5
E _R				1.2		1.2					1.2			1.2
f _{sv}				0.990		0.985					0.990			0.985
f _p				1.00		1.00					1.00			1.00
On Flow (pcph)				371		263					193			467
On Flow (pcphpl)				371		263					193			467
Calculate On Ramp Roadway Operations														
On Ramp Type				Right		Right					Right			Right
On Ramp Speed (mph)				45		25					45			25
On Ramp Cap (pcph)				2,100		1,900					2,100			1,900
On Ramp v/c ratio				0.18		0.14					0.09			0.25

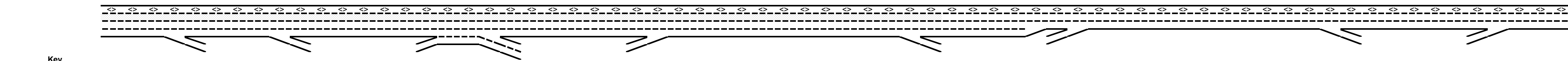


Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	1,073	287		98				192				147		
PHF	0.92	0.92		0.94				0.74				0.91		
Total Lanes	1	1		2				1				1		
Terrain	Level	Level		Level				Level				Level		
Grade %	0.0%	0.0%		0.0%				0.0%				0.0%		
Grade Length (mi)	0.00	0.00		0.00				0.00				0.00		
Truck & Bus %	2.0%	2.0%		5.0%				2.0%				2.0%		
RV %	0.0%	0.0%		0.0%				0.0%				0.0%		
E _T	1.5	1.5		1.5				1.5				1.5		
E _R	1.2	1.2		1.2				1.2				1.2		
f _{RV}	0.990	0.990		0.976				0.990				0.990		
f _p	1.00	1.00		1.00				1.00				1.00		
Off Flow (pcph)	1,178	315		107				262				163		
Off Flow (pcphpl)	1,178	315		53				262				163		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right	Right		Right				Right				Right		
Off Ramp Speed	45	25		45				45				45		
Off Ramp Cap (pcph)	2,100	1,900		4,200				2,100				2,100		
Off Ramp v/c ratio	0.56	0.17		0.03				0.12				0.08		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type		Off					No							
Up Distance		2,350												
Up Flow (pcph)		1,178												
Down Type	Off	On					On					On		
Down Distance	850	1,975					3,600					2,100		
Down Flow (pcph)	315	371					193					193		
Calculate Merge Influence Area Operations														
Effective v _p (pcph)							1,620				1,621			1,672
Up Ramp L _{EQ}							1,148							
Down Ramp L _{EQ}							0.593				0.592			0.592
P _{FM} (Eqn 13-3)														
P _{FM} (Eqn 13-4)		#VALUE!												
P _{FM} (Eqn 13-5)	0.646													
P _{FM}							0.593				1.000			1.000
v ₁₂ (pcph)							961				1,621			1,672
v ₃ (pcph)							660							
v ₃₄ (pcph)														
v _{12a} (pcph)							961				1,621			1,672
v _{R12a} (pcph)							1,223				1,815			2,139
Merge Speed Index							0.31				0.30			0.33
Merge Area Speed							57.9				58.1			57.4
Outer Lanes Volume							660							
Outer Lanes Speed							64.4							
Segment Speed							60.1				58.1			57.4
Merge v/c ratio							0.27				0.39			0.46
Merge Density							11.4				16.4			18.8
Merge LOS							B				B			B



Key
 <-> Express Lane (HOV)
 No Trucks

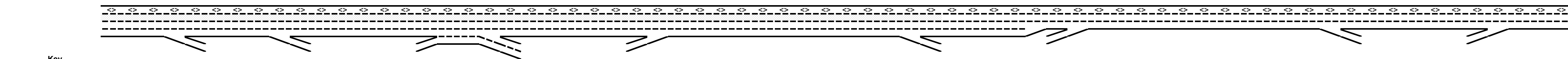
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	2,851	1,656						1,869				1,807		
Up Ramp L_{EQ}		13,835												
Down Ramp L_{EQ}	505	378						195						
P_{FD} (Eqn 13-9)	0.635	0.704						0.701				0.707		
P_{FD} (Eqn 13-10)														
P_{FD} (Eqn 13-11)	0.602													
P_{FD}	0.635	0.704						0.701				1.000		
v_{12} (pcph)	2,240	1,259						1,389				1,807		
v_3 (pcph)	612	397						480						
v_{34} (pcph)														
v_{123} (pcph)	2,240	1,259						1,389				1,807		
Diverge Speed Index	0.40	0.59						0.32				0.31		
Diverge Area Speed	55.7	51.5						57.6				57.8		
Outer Lanes Volume	612	397						480						
Outer Lanes Speed	71.3	71.3						71.3						
Segment Speed	58.4	55.2						60.6				57.8		
Diverge v/c ratio	0.51	0.29						0.32				0.41		
Diverge Density	22.2	13.7						14.8				18.4		
Diverge LOS	C	B						B				B		
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)				68										
PHF				0.87										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				3.5%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.983										
f_p				1.00										
On to Off Flow (pcph)				79										
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)				270										
PHF				0.92										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				2.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.990										
f_p				1.00										
On to ML Flow (pcph)				297										
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)				30										
PHF				0.94										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				5.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.976										
f_p				1.00										
ML to Off Flow (pcph)				33										



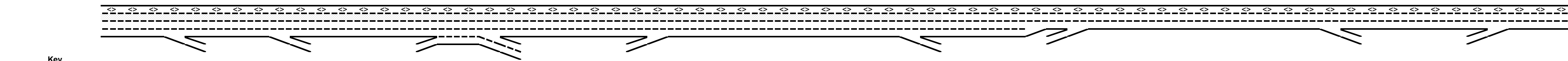
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Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)				1,110										
PHF				0.87										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				4.0%										
RV %				0.0%										
E _T				1.5										
E _R				1.2										
f _{RV}				0.980										
f _p				1.00										
GP to GP Flow (pcph)				1,301										
Calculate Weave Segment Operations														
Weave Type				One-sided										
Weave Length				2,000										
Segment Lanes				3										
Weave Lanes				2										
Weave Flow (pcph)				330										
Non-Weave Flow				1,380										
Segment Flow				1,710										
Max Weave Length				4,465										
Length Check				OK										
Ideal Weave Capacity				2,161										
f _{RV}				0.982										
f _p				0.998										
Capacity Condition 1				6,357										
Capacity Condition 2				12,192										
Weave v/c ratio				0.26										
Interchange Density				2										
Lane Changes On to ML				1										
Lane Changes ML to Off				0										
Lane Changes On to Off				0										
Min Lane Change Rate				297										
Weave LC Rate				930										
Non-Weave LC Rate 1				790										
Non-Weave LC Rate 2				1,997										
Non-Weave LC Rate 3				-598										
Segment LC Rate				1,721										
Weave Intensity Factor				0.201										
Weave Speed				56.6										
Non-Weave Speed				60.1										
Segment Speed				59.4										
Weave Density				9.6										
Weave LOS				A										
Summarize Segment Operations														
Segment v/c ratio	0.51	0.29	0.19	0.26	0.23	0.27	0.30	0.32	0.23	0.39	0.38	0.41	0.35	0.46
Segment Density	22.2	13.7	6.9	9.6	8.2	11.4	10.9	14.8	8.5	16.4	13.9	18.4	12.6	18.8
Segment LOS	C	B	A	A	A	B	A	B	A	B	B	B	B	B
Over Capacity														

Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50
Alternative: Existing Conditions
Time Period: PM Peak Hour

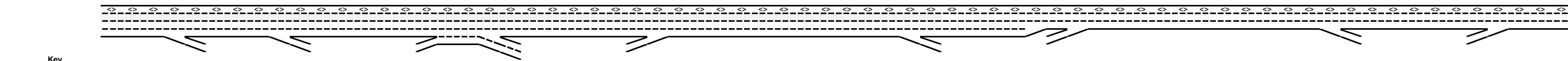
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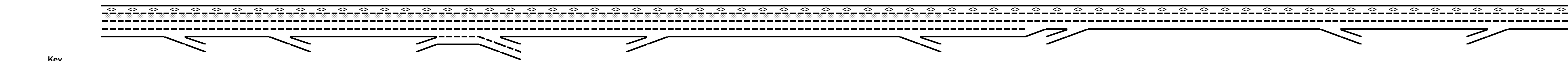
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Define Freeway Segment														
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge
Length (ft)	1,500	850	1,975	3,000	1,575	1,500	2,925	1,500	2,100	1,500	3,300	1,500	1,350	1,500
Accel Length						550				500				500
Decel Length	150	150						150				150		
Mainline Volume	4,870	4,165	3,419	3,419	3,588	3,588	3,983	3,983	3,365	3,365	3,469	3,469	2,946	2,946
On Ramp Volume				648		395				104				318
Off Ramp Volume	705	746		479				618				523		
Express Lane Volume	536	458	376	376	395	395	438	438	370	370	382	382	324	324
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	4,334	3,707	3,043	3,691	3,193	3,588	3,545	3,545	2,995	3,099	3,087	3,087	2,622	2,940
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
GP Lanes	3	3	3	4	3	3	3	3	3	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	6.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.995	0.995	0.995	0.995	0.995	0.995	0.952	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	4,491	3,841	3,153	3,824	3,309	3,718	3,837	3,673	3,103	3,211	3,199	3,199	2,717	3,046
GP Flow (pcphpl)	1,497	1,280	1,051	956	1,103	1,239	1,279	1,224	1,034	1,605	1,599	1,599	1,358	1,523
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.64	0.54	0.45	0.41	0.47	0.53	0.54	0.52	0.44	0.68	0.68	0.68	0.58	0.65
Speed (mph)	64.9	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.4	64.4	64.4	65.0	64.8
Density (pcphpl)	23.1	19.7	16.2	14.7	17.0	19.1	19.7	18.8	15.9	24.9	24.8	24.8	20.9	23.5
LOS	C	C	B	B	B	C	C	C	B	C	C	C	C	C
Calculate Operations for Entering GP Lanes														
GP _N Vol (pcph)				3,153		3,195				3,084				2,697
GP _N Cap (pcph)				7,050		7,050				4,700				4,700
GP _N v/c ratio				0.45		0.45				0.66				0.57
Calculate Operations for Exiting GP Lanes														
GP _{OUT} Vol (pcph)	3,760	3,068		3,286				3,029	3,103			2,625		
GP _{OUT} Cap (pcph)	7,050	7,050		7,050				7,050	4,700			4,700		
GP _{OUT} v/c ratio	0.53	0.44		0.47				0.43	0.66			0.56		



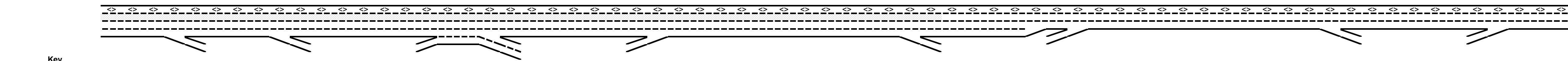
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	536	458	376	376	395	395	438	438	370	370	382	382	324	324
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	601	514	422	422	443	443	531	492	415	415	428	428	364	364
EL Flow (pcphpl)	601	514	422	422	443	443	531	492	415	415	428	428	364	364
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{lw}														
f _{lc}														
Calc'd FFS														
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _{sv} v/c ratio	0.34	0.29	0.24	0.24	0.25	0.25	0.30	0.28	0.24	0.24	0.24	0.24	0.21	0.21
Calculate On Ramp Flow Rate														
On Volume (vph)				648		395				104				318
PHF				0.97		0.76				0.83				0.92
Total Lanes				1		1				1				1
Terrain				Level		Level				Level				Level
Grade %				0.0%		0.0%				0.0%				0.0%
Grade Length (mi)				0.00		0.00				0.00				0.00
Truck & Bus %				1.0%		1.0%				2.0%				2.0%
RV %				0.0%		0.0%				0.0%				0.0%
E _T				1.5		1.5				1.5				1.5
E _R				1.2		1.2				1.2				1.2
f _{sv}				0.995		0.995				0.990				0.990
f _p				1.00		1.00				1.00				1.00
On Flow (pcph)				671		522				127				349
On Flow (pcphpl)				671		522				127				349
Calculate On Ramp Roadway Operations														
On Ramp Type				Right		Right				Right				Right
On Ramp Speed (mph)				45		25				45				25
On Ramp Cap (pcph)				2,100		1,900				2,100				1,900
On Ramp v/c ratio				0.32		0.27				0.06				0.18



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	705	746		479				618				523		
PHF	0.97	0.97		0.89				0.97				0.92		
Total Lanes	1	1		2				1				1		
Terrain	Level	Level		Level				Level				Level		
Grade %	0.0%	0.0%		0.0%				0.0%				0.0%		
Grade Length (mi)	0.00	0.00		0.00				0.00				0.00		
Truck & Bus %	1.0%	1.0%		0.0%				2.0%				2.0%		
RV %	0.0%	0.0%		0.0%				0.0%				0.0%		
E _T	1.5	1.5		1.5				1.5				1.5		
E _R	1.2	1.2		1.2				1.2				1.2		
f _{RV}	0.995	0.995		1.000				0.990				0.990		
f _p	1.00	1.00		1.00				1.00				1.00		
Off Flow (pcph)	730	773		538				643				574		
Off Flow (pcphpl)	730	773		269				643				574		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right	Right		Right				Right				Right		
Off Ramp Speed	45	25		45				45				45		
Off Ramp Cap (pcph)	2,100	1,900		4,200				2,100				2,100		
Off Ramp v/c ratio	0.35	0.41		0.13				0.31				0.27		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type		Off					No		No					
Up Distance		2,350												
Up Flow (pcph)		730												
Down Type	Off	On					On		On					
Down Distance	850	1,975					3,600		2,100					
Down Flow (pcph)	773	671					127		127					
Calculate Merge Influence Area Operations														
Effective v _p (pcph)							3,195				3,084			2,697
Up Ramp L _{EQ}							751							
Down Ramp L _{EQ}							0.593				0.592			0.592
P _{FM} (Eqn 13-3)														
P _{FM} (Eqn 13-4)		#VALUE!												
P _{FM} (Eqn 13-5)	0.788													
P _{FM}							0.593				1.000			1.000
v ₁₂ (pcph)							1,895				3,084			2,697
v ₃ (pcph)							1,301							
v ₃₄ (pcph)														
v _{12a} (pcph)							1,895				3,084			2,697
v _{R12a} (pcph)							2,417				3,211			3,046
Merge Speed Index							0.34				0.37			0.38
Merge Area Speed							57.2				56.4			56.3
Outer Lanes Volume							1,301							
Outer Lanes Speed							62.1							
Segment Speed							58.9				56.4			56.3
Merge v/c ratio							0.53				0.70			0.66
Merge Density							20.6				27.3			25.9
Merge LOS							C				C			C



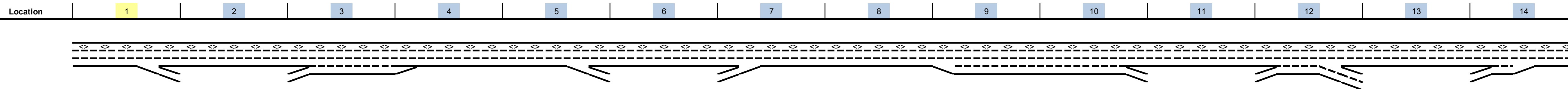
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	4,491	3,841						3,673				3,199		
Up Ramp L_{EQ}		7,261												
Down Ramp L_{EQ}	1,049	905						159						
P_{FD} (Eqn 13-9)	0.614	0.628						0.639				0.654		
P_{FD} (Eqn 13-10)														
P_{FD} (Eqn 13-11)	0.635													
P_{FD}	0.635	0.628						0.639				1.000		
v_{12} (pcph)	3,119	2,701						2,578				3,199		
v_3 (pcph)	1,372	1,140						1,095						
v_{34} (pcph)														
v_{123} (pcph)	3,119	2,701						2,578				3,199		
Diverge Speed Index	0.36	0.63						0.36				0.35		
Diverge Area Speed	56.6	50.6						56.8				57.0		
Outer Lanes Volume	1,372	1,140						1,095						
Outer Lanes Speed	69.9	70.8						70.9						
Segment Speed	60.1	55.2						60.4				57.0		
Diverge v/c ratio	0.71	0.61						0.59				0.73		
Diverge Density	29.7	26.1						25.1				30.4		
Diverge LOS	D	C						C				D		
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)				121										
PHF				0.97										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				0.5%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.998										
f_p				1.00										
On to Off Flow (pcph)				125										
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)				527										
PHF				0.97										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				1.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.995										
f_p				1.00										
On to ML Flow (pcph)				546										
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)				358										
PHF				0.89										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				0.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				1.000										
f_p				1.00										
ML to Off Flow (pcph)				402										



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)				2,685										
PHF				0.97										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				1.0%										
RV %				0.0%										
E _T				1.5										
E _R				1.2										
f _{RV}				0.995										
f _p				1.00										
GP to GP Flow (pcph)				2,782										
Calculate Weave Segment Operations														
Weave Type				One-sided										
Weave Length				2,000										
Segment Lanes				3										
Weave Lanes				2										
Weave Flow (pcph)				948										
Non-Weave Flow				2,907										
Segment Flow				3,855										
Max Weave Length				5,011										
Length Check				OK										
Ideal Weave Capacity				2,120										
f _{RV}				0.996										
f _p				0.999										
Capacity Condition 1				6,327										
Capacity Condition 2				9,711										
Weave v/c ratio				0.61										
Interchange Density				2										
Lane Changes On to ML				1										
Lane Changes ML to Off				0										
Lane Changes On to Off				0										
Min Lane Change Rate				546										
Weave LC Rate				1,179										
Non-Weave LC Rate 1				1,105										
Non-Weave LC Rate 2				2,337										
Non-Weave LC Rate 3				845										
Segment LC Rate				2,285										
Weave Intensity Factor				0.251										
Weave Speed				55.0										
Non-Weave Speed				54.9										
Segment Speed				54.9										
Weave Density				23.4										
Weave LOS				C										
Summarize Segment Operations														
Segment v/c ratio	0.71	0.61	0.45	0.61	0.47	0.53	0.54	0.59	0.44	0.70	0.68	0.73	0.58	0.66
Segment Density	29.7	26.1	16.2	23.4	17.0	20.6	19.7	25.1	15.9	27.3	24.8	30.4	20.9	25.9
Segment LOS	D	C	B	C	B	C	C	C	B	C	C	D	C	C
Over Capacity														

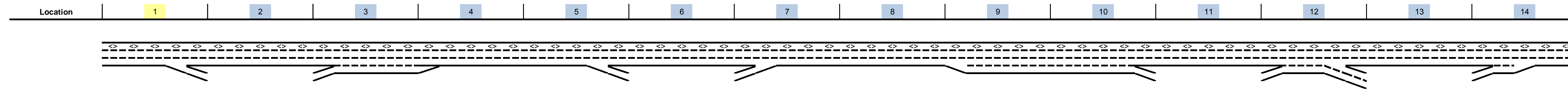
Project: Marble Valley EIR
Freeway Corridor: Westbound US 50
Alternative: Existing Conditions
Time Period: AM Peak Hour

Data Entry Value
Calculated Value



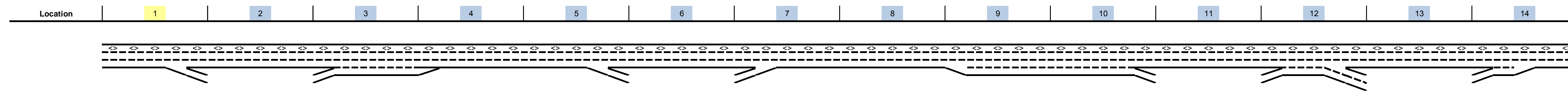
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd on-ramp
Define Freeway Segment														
Type	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Basic	Diverge	Basic	Weave	Basic	Merge
Length (ft)	1,500	1,250	1,500	4,900	1,500	2,350	1,500	1,700	500	1,500	2,550	2,800	2,300	1,500
Accel Length			1,500				375							880
Decel Length	150				150					1,500				
Mainline Volume	3,032	2,596	2,596	3,166	3,166	3,065	3,065	3,798	3,798	3,798	3,302	3,302	3,253	3,253
On Ramp Volume			570				733					489		1,223
Off Ramp Volume	436				101					496		538		
Express Lane Volume	334	286	286	348	348	337	337	418	418	418	363	363	358	358
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,698	2,310	2,880	2,818	2,818	2,728	3,461	3,380	3,380	3,380	2,939	3,428	2,895	4,118
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
GP Lanes	2	2	3	2	2	2	2	2	3	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	2,885	2,470	3,080	3,013	3,013	2,916	3,700	3,614	3,614	3,614	3,142	3,665	3,095	4,403
GP Flow (pcphpl)	1,443	1,235	1,027	1,506	1,506	1,458	1,850	1,807	1,205	1,205	1,571	1,222	1,548	2,201
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.61	0.53	0.44	0.64	0.64	0.62	0.79	0.77	0.51	0.51	0.67	0.52	0.66	0.94
Speed (mph)	65.0	65.0	65.0	64.8	64.8	65.0	62.1	62.7	65.0	65.0	64.6	65.0	64.7	55.9
Density (pcphpl)	22.2	19.0	15.8	23.2	23.2	22.5	29.8	28.8	18.5	18.5	24.3	18.8	23.9	39.4
LOS	C	C	B	C	C	C	D	D	C	C	C	C	C	E
Calculate Operations for Entering GP Lanes														
GP _{in} Vol (pcph)			2,480				2,868		3,614			3,139		3,060
GP _{in} Cap (pcph)			4,700				4,700		4,700			4,700		4,700
GP _{in} v/c ratio			0.53				0.61		0.77			0.67		0.65
Calculate Operations for Exiting GP Lanes														
GP _{out} Vol (pcph)	2,218				2,845					3,038			3,074	
GP _{out} Cap (pcph)	4,700				4,700					4,700			4,700	
GP _{out} v/c ratio	0.47				0.61					0.65			0.65	

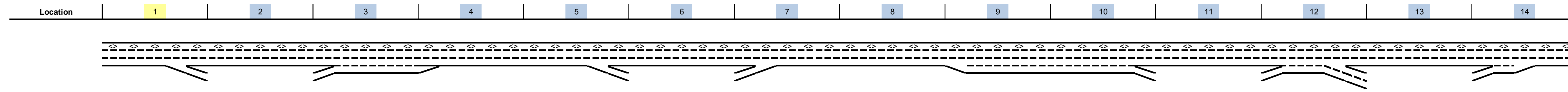


Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	334	286	286	348	348	337	337	418	418	418	363	363	358	358
PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	378	324	324	395	395	383	383	474	474	474	412	412	406	406
EL Flow (pcphpl)	378	324	324	395	395	383	383	474	474	474	412	412	406	406
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{LW}														
f _{LC}														
Calcd FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Measured FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _N v/c ratio	0.22	0.19	0.19	0.23	0.23	0.22	0.22	0.27	0.27	0.27	0.24	0.24	0.23	0.23
Calculate On Ramp Flow Rate														
On Volume (vph)			570				733					489		1,223
PHF			0.96				0.89					0.93		0.92
Total Lanes			1				1					1		1
Terrain			Level				Level					Level		Level
Grade %			0.0%				0.0%					0.0%		0.0%
Grade Length (mi)			0.00				0.00					0.00		0.00
Truck & Bus %			2.0%				2.0%					0.0%		2.0%
RV %			0.0%				0.0%					0.0%		0.0%
E _T			1.5				1.5					1.5		1.5
E _R			1.2				1.2					1.2		1.2
f _{RV}			0.990				0.990					1.000		0.990
f _p			1.00				1.00					1.00		1.00
On Flow (pcph)			600				832					526		1,343
On Flow (pcphpl)			600				832					526		1,343
Calculate On Ramp Roadway Operations														
On Ramp Type			Right				Right					Right		Right
On Ramp Speed (mph)			25				45					45		45
On Ramp Cap (pcph)			1,900				2,100					2,100		2,100
On Ramp v/c ratio			0.32				0.40					0.25		0.64

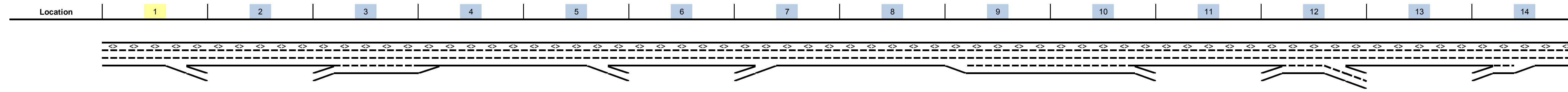


Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	436				101					496		538		
PHF	0.66				0.61					0.87		0.92		
Total Lanes	1				1					1		2		
Terrain	Level				Level					Level		Level		
Grade %	0.0%				0.0%					0.0%		0.0%		
Grade Length (mi)	0.00				0.00					0.00		0.00		
Truck & Bus %	2.0%				2.0%					2.0%		2.0%		
RV %	0.0%				0.0%					0.0%		0.0%		
E _T	1.5				1.5					1.5		1.5		
E _R	1.2				1.2					1.2		1.2		
f _{TR}	0.990				0.990					0.990		0.990		
f _p	1.00				1.00					1.00		1.00		
Off Flow (pcph)	667				167					576		591		
Off Flow (pcphpl)	667				167					576		295		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right				Right					Right		Right		
Off Ramp Speed	45				45					45		25		
Off Ramp Cap (pcph)	2,100				2,100					2,100		3,800		
Off Ramp v/c ratio	0.32				0.08					0.27		0.16		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type			Off							On		Off		
Up Distance			1,250							5,200		2,550		
Up Flow (pcph)			667							632		576		
Down Type			Off							On		No		
Down Distance			7,900							1,500				
Down Flow (pcph)			167							1,343				
Calculate Merge Influence Area Operations														
Effective V _p (pcph)			2,480							2,868				3,060
Up Ramp L _{EQ}			230											
Down Ramp L _{EQ}			619											
P _{TR} (Eqn 13-3)			0.620							0.588				0.602
P _{TR} (Eqn 13-4)			0.684											
P _{TR} (Eqn 13-5)			0.554											
P _{TR}			1.000							1.000				1.000
V ₁₂ (pcph)			2,480							2,868				3,060
V ₃ (pcph)														
V ₃₄ (pcph)														
V ₁₂₄ (pcph)			2,480							2,868				3,060
V ₁₂₃₄ (pcph)			3,080							3,700				4,403
Merge Speed Index			0.33							0.45				0.56
Merge Area Speed			57.4							54.8				52.1
Outer Lanes Volume														
Outer Lanes Speed														
Segment Speed			57.4							54.8				52.1
Merge v/c ratio			0.67							0.80				0.96
Merge Density			19.8							31.6				33.7
Merge LOS			B							D				D



Key
 <-> Express Lane (HOV)
 - - - No Trucks

Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	2,885				3,013					3,614				
Up Ramp L_{EQ}										7,538				
Down Ramp L_{EQ}										1,634				
P_{FD} (Eqn 13-9)	0.657				0.677					0.643				
P_{FD} (Eqn 13-10)										0.673				
P_{FD} (Eqn 13-11)			#VALUE!											
P_{FD}	1.000				1.000					0.673				
v_{12} (pcph)	2,885				3,013					2,620				
v_2 (pcph)										994				
v_{24} (pcph)														
v_{24a} (pcph)	2,885				3,013					2,620				
Diverge Speed Index	0.36				0.31					0.35				
Diverge Area Speed	56.8				57.8					57.0				
Outer Lanes Volume										994				
Outer Lanes Speed										71.3				
Segment Speed	56.8				57.8					60.3				
Diverge v/c ratio	0.66				0.68					0.60				
Diverge Density	27.7				28.8					13.3				
Diverge LOS	C				D					B				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)													91	
PHF													0.94	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													1.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.995	
f_p													1.00	
On to Off Flow (pcph)													98	
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)													398	
PHF													0.93	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													0.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													1.000	
f_p													1.00	
On to ML Flow (pcph)													427	
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)													447	
PHF													0.92	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													2.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.990	
f_p													1.00	
ML to Off Flow (pcph)													490	
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)													2,492	
PHF													0.94	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													1.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.995	
f_p													1.00	
GP to GP Flow (pcph)													2,665	

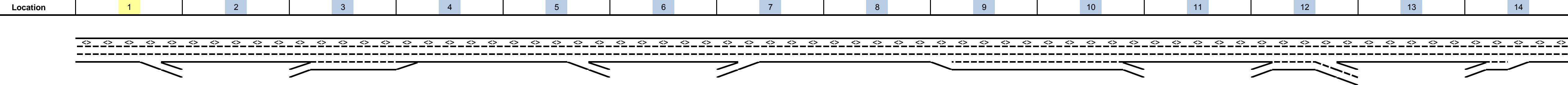


Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Weave Segment Operations														
Weave Type												One-sided		
Weave Length												1,800		
Segment Lanes												2		
Weave Lanes												2		
Weave Flow (pcph)												918		
Non-Weave Flow												2,762		
Segment Flow												3,680		
Max Weave Length												5,047		
Length Check												OK		
Ideal Weave Capacity												2,102		
f_{wv}												0.995		
f_p												1.000		
Capacity Condition 1												4,182		
Capacity Condition 2												9,575		
Weave v/c ratio												0.88		
Interchange Density												1		
Lane Changes On to ML												1		
Lane Changes ML to Off												0		
Lane Changes On to Off												0		
Min Lane Change Rate												427		
Weave LC Rate												1,082		
Non-Weave LC Rate 1												1,159		
Non-Weave LC Rate 2												2,305		
Non-Weave LC Rate 3												-255		
Segment LC Rate												2,242		
Weave Intensity Factor												0.269		
Weave Speed												54.4		
Non-Weave Speed												53.1		
Segment Speed												53.4		
Weave Density												34.4		
Weave LOS												D		
Summarize Segment Operations														
Segment v/c ratio	0.66	0.53	0.67	0.64	0.68	0.62	0.80	0.77	0.51	0.60	0.67	0.88	0.66	0.96
Segment Density	27.7	19.0	19.8	23.2	28.8	22.5	31.6	28.8	18.5	13.3	24.3	34.4	23.9	33.7
Segment LOS	C	C	B	C	D	C	D	D	C	B	C	D	C	D
Over Capacity														

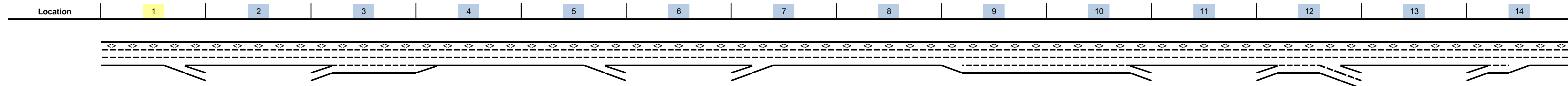
Project: Marble Valley EIR
Freeway Corridor: Westbound US 50
Alternative: Existing Conditions
Time Period: PM Peak Hour

Data Entry Value
Calculated Value

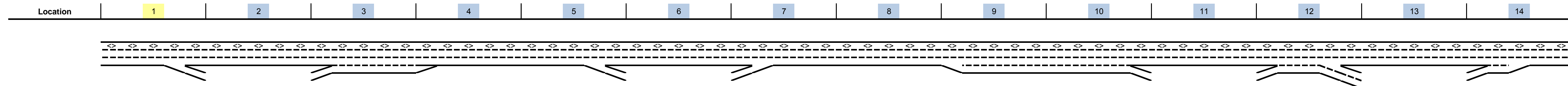


Key
 <-> Express Lane (HOV)
 No Trucks

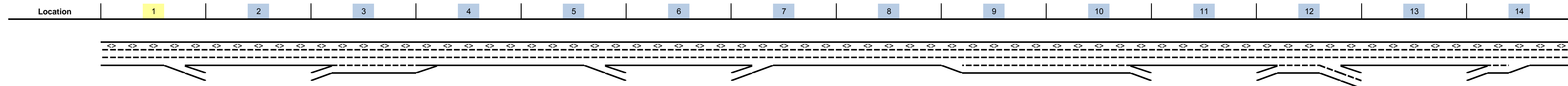
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Define Freeway Segment														
Type	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Basic	Diverge	Basic	Weave	Basic	Merge
Length (ft)	1,500	1,250	1,500	4,900	1,500	2,350	1,500	1,700	500	1,500	2,550	2,800	2,300	1,500
Accel Length			1,500				375							880
Decel Length	150				150					1,500				
Mainline Volume	2,425	1,977	1,977	2,215	2,215	2,083	2,083	2,341	2,341	2,341	1,940	1,940	1,807	1,807
On Ramp Volume			238				258					222		1,384
Off Ramp Volume	448				132					401		355		
Express Lane Volume	194	158	158	177	177	167	167	187	187	187	155	155	145	145
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,231	1,819	2,057	2,038	2,038	1,916	2,174	2,154	2,154	2,154	1,785	2,007	1,662	3,046
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
GP Lanes	2	2	3	2	2	2	2	2	3	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	2,347	1,914	2,164	2,144	2,144	2,016	2,288	2,266	2,266	2,266	1,878	2,111	1,749	3,205
GP Flow (pcphpl)	1,174	957	721	1,072	1,072	1,008	1,144	1,133	755	755	939	704	875	1,603
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.50	0.41	0.31	0.46	0.46	0.43	0.49	0.48	0.32	0.32	0.40	0.30	0.37	0.68
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.4
Density (pcphpl)	18.1	14.7	11.1	16.5	16.5	15.5	17.6	17.4	11.6	11.6	14.4	10.8	13.5	24.9
LOS	C	B	B	B	B	B	B	B	B	B	B	A	B	C
Calculate Operations for Entering GP Lanes														
GP _{IN} Vol (pcph)			1,897				2,016		2,266			1,865		1,771
GP _{IN} Cap (pcph)			4,700				4,700		4,700			4,700		4,700
GP _{IN} v/c ratio			0.40				0.43		0.48			0.40		0.38
Calculate Operations for Exiting GP Lanes														
GP _{OUT} Vol (pcph)	1,839				1,971					1,820			1,744	
GP _{OUT} Cap (pcph)	4,700				4,700					4,700			4,700	
GP _{OUT} v/c ratio	0.39				0.42					0.39			0.37	



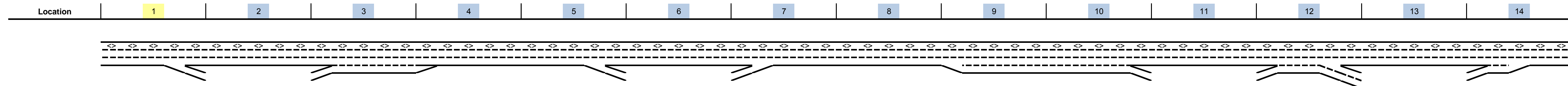
Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Key														
<- Express Lane (HOV)														
No Trucks														
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	194	158	158	177	177	167	167	187	187	187	155	155	145	145
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	218	177	177	199	199	187	187	210	210	210	174	174	162	162
EL Flow (pcphpl)	218	177	177	199	199	187	187	210	210	210	174	174	162	162
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{lw}														
f _{lc}														
Calc'd FFS														
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _{sv} v/c ratio	0.12	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.10	0.10	0.09	0.09
Calculate On Ramp Flow Rate														
On Volume (vph)			238				258					222		1,384
PHF			0.9				0.96					0.9		0.97
Total Lanes			1				1					1		1
Terrain			Level				Level					Level		Level
Grade %			0.0%				0.0%					0.0%		0.0%
Grade Length (mi)			0.00				0.00					0.00		0.00
Truck & Bus %			2.0%				2.0%					0.0%		1.0%
RV %			0.0%				0.0%					0.0%		0.0%
E _T			1.5				1.5					1.5		1.5
E _R			1.2				1.2					1.2		1.2
f _{sv}			0.990				0.990					1.000		0.995
f _p			1.00				1.00					1.00		1.00
On Flow (pcph)			267				271					247		1,434
On Flow (pcphpl)			267				271					247		1,434
Calculate On Ramp Roadway Operations														
On Ramp Type			Right				Right					Right		Right
On Ramp Speed (mph)			25				45					45		45
On Ramp Cap (pcph)			1,900				2,100					2,100		2,100
On Ramp v/c ratio			0.14				0.13					0.12		0.68



Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Key														
<- Express Lane (HOV)														
No Trucks														
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	448				132					401		355		
PHF	0.89				0.77					0.9		0.97		
Total Lanes	1				1					1		2		
Terrain	Level				Level					Level		Level		
Grade %	0.0%				0.0%					0.0%		0.0%		
Grade Length (mi)	0.00				0.00					0.00		0.00		
Truck & Bus %	2.0%				2.0%					0.0%		1.0%		
RV %	0.0%				0.0%					0.0%		0.0%		
E _T	1.5				1.5					1.5		1.5		
E _R	1.2				1.2					1.2		1.2		
f _{RV}	0.990				0.990					1.000		0.995		
f _p	1.00				1.00					1.00		1.00		
Off Flow (pcph)	508				173					446		368		
Off Flow (pcphpl)	508				173					446		184		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right				Right					Right		Right		
Off Ramp Speed	45				45					45		25		
Off Ramp Cap (pcph)	2,100				2,100					2,100		3,800		
Off Ramp v/c ratio	0.24				0.08					0.21		0.10		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type			Off							On		Off		
Up Distance			1,250							5,200		2,550		
Up Flow (pcph)			508							271		446		
Down Type			Off							On		No		
Down Distance			7,900							1,500				
Down Flow (pcph)			173							1,434				
Calculate Merge Influence Area Operations														
Effective v _p (pcph)			1,897					2,016						1,771
Up Ramp L _{EQ}			34											
Down Ramp L _{EQ}			641											
P _{FM} (Eqn 13-3)			0.620					0.588						0.602
P _{FM} (Eqn 13-4)			0.696									#VALUE!		
P _{FM} (Eqn 13-5)			0.554											
P _{FM}			1.000					1.000						1.000
v ₁₂ (pcph)			1,897					2,016						1,771
v ₃ (pcph)														
v ₃₄ (pcph)														
v _{12a} (pcph)			1,897					2,016						1,771
v _{R12a} (pcph)			2,164					2,288						3,205
Merge Speed Index			0.28					0.33						0.34
Merge Area Speed			58.6					57.5						57.2
Outer Lanes Volume														
Outer Lanes Speed														
Segment Speed			58.6					57.5						57.2
Merge v/c ratio			0.47					0.50						0.70
Merge Density			12.8					20.8						24.3
Merge LOS			B					C						C



Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Key														
<> Express Lane (HOV)														
No Trucks														
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	2,347				2,144					2,266				
Up Ramp L_{EQ}										3,041				
Down Ramp L_{EQ}										1,570				
P_{FD} (Eqn 13-9)	0.678				0.698					0.683				
P_{FD} (Eqn 13-10)										0.660				
P_{FD} (Eqn 13-11)			#VALUE!											
P_{FD}	1.000				1.000					0.683				
v_{12} (pcph)	2,347				2,144					1,689				
v_3 (pcph)										577				
v_{34} (pcph)														
v_{123} (pcph)	2,347				2,144					1,689				
Diverge Speed Index	0.34				0.31					0.34				
Diverge Area Speed	57.1				57.8					57.2				
Outer Lanes Volume										577				
Outer Lanes Speed										71.3				
Segment Speed	57.1				57.8					60.3				
Diverge v/c ratio	0.53				0.49					0.38				
Diverge Density	23.1				21.3					5.3				
Diverge LOS	C				C					A				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)												93		
PHF												0.96		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												0.5%		
RV %												0.0%		
E_T												1.5		
E_R												1.2		
f_{HV}												0.998		
f_p												1.00		
On to Off Flow (pcph)												97		
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)												129		
PHF												0.9		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												0.0%		
RV %												0.0%		
E_T												1.5		
E_R												1.2		
f_{HV}												1.000		
f_p												1.00		
On to ML Flow (pcph)												144		
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)												262		
PHF												0.97		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												1.0%		
RV %												0.0%		
E_T												1.5		
E_R												1.2		
f_{HV}												0.995		
f_p												1.00		
ML to Off Flow (pcph)												272		



Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Key														
<> Express Lane (HOV)														
No Trucks														
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)												1,522		
PHF												0.96		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												2.0%		
RV %												0.0%		
E _T												1.5		
E _R												1.2		
f _{RV}												0.990		
f _p												1.00		
GP to GP Flow (pcph)												1,602		
Calculate Weave Segment Operations														
Weave Type												One-sided		
Weave Length												1,800		
Segment Lanes												2		
Weave Lanes												2		
Weave Flow (pcph)												416		
Non-Weave Flow												1,698		
Segment Flow												2,114		
Max Weave Length												4,502		
Length Check												OK		
Ideal Weave Capacity												2,143		
f _{RV}												0.992		
f _p												1.000		
Capacity Condition 1												4,251		
Capacity Condition 2												12,104		
Weave v/c ratio												0.49		
Interchange Density												2		
Lane Changes On to ML												1		
Lane Changes ML to Off												0		
Lane Changes On to Off												0		
Min Lane Change Rate												144		
Weave LC Rate												781		
Non-Weave LC Rate 1												940		
Non-Weave LC Rate 2												2,068		
Non-Weave LC Rate 3												-254		
Segment LC Rate												1,721		
Weave Intensity Factor												0.218		
Weave Speed												56.0		
Non-Weave Speed												58.9		
Segment Speed												58.3		
Weave Density												18.1		
Weave LOS												B		
Summarize Segment Operations														
Segment v/c ratio	0.53	0.41	0.47	0.46	0.49	0.43	0.50	0.48	0.32	0.38	0.40	0.49	0.37	0.70
Segment Density	23.1	14.7	12.8	16.5	21.3	15.5	20.8	17.4	11.6	5.3	14.4	18.1	13.5	24.3
Segment LOS	C	B	B	B	C	B	C	B	B	A	B	B	B	C
Over Capacity														

Leisch Method for Weaving Analysis

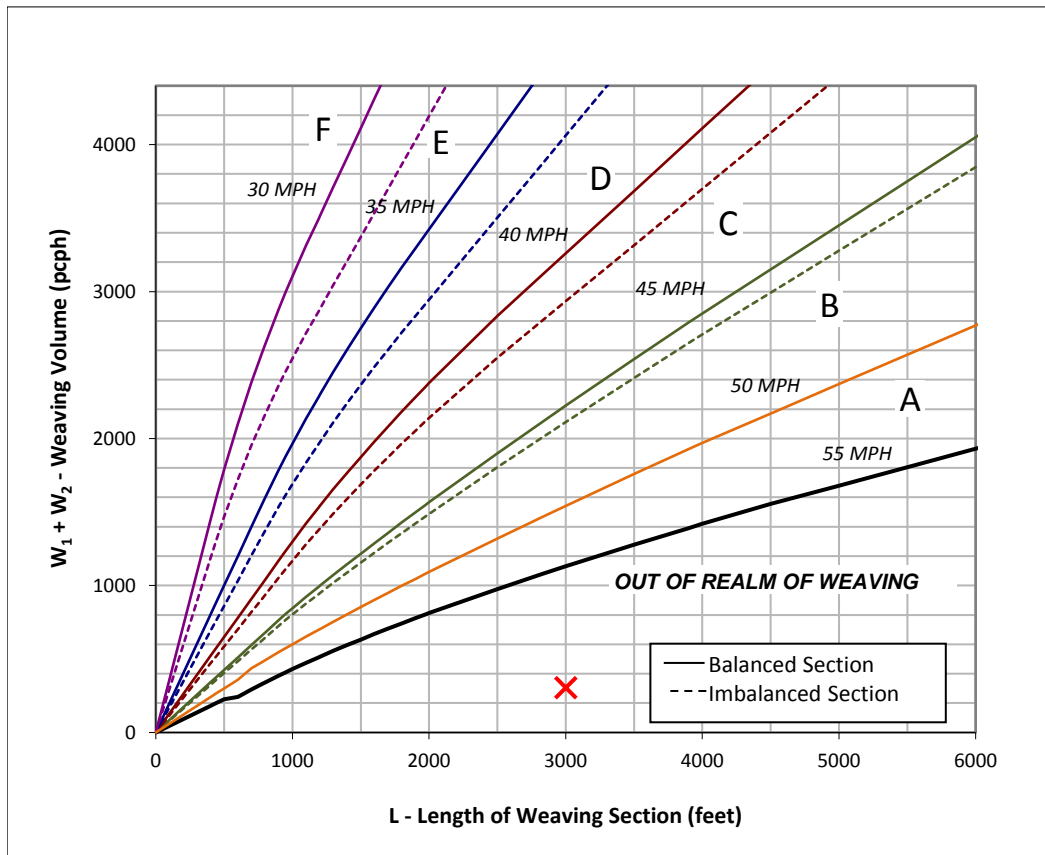
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,000

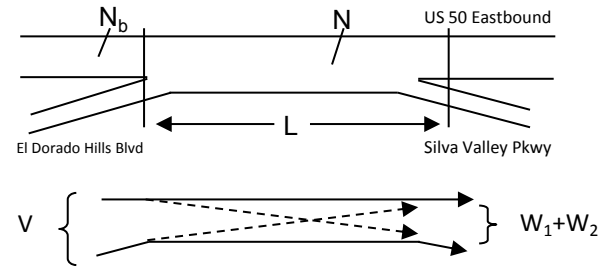
Project Information

Project	Marble Valley EIR
Scenario	Existing AM Peak Hour
Freeway	US 50 Eastbound
On-ramp	El Dorado Hills Blvd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	1,538	Volume (vph)*	270	Volume (vph)*	30
Truck Percentage	4%	Truck Percentage	2%	Truck Percentage	5%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	1,569	Volume (pcph)	273	Volume (pcph)	31



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

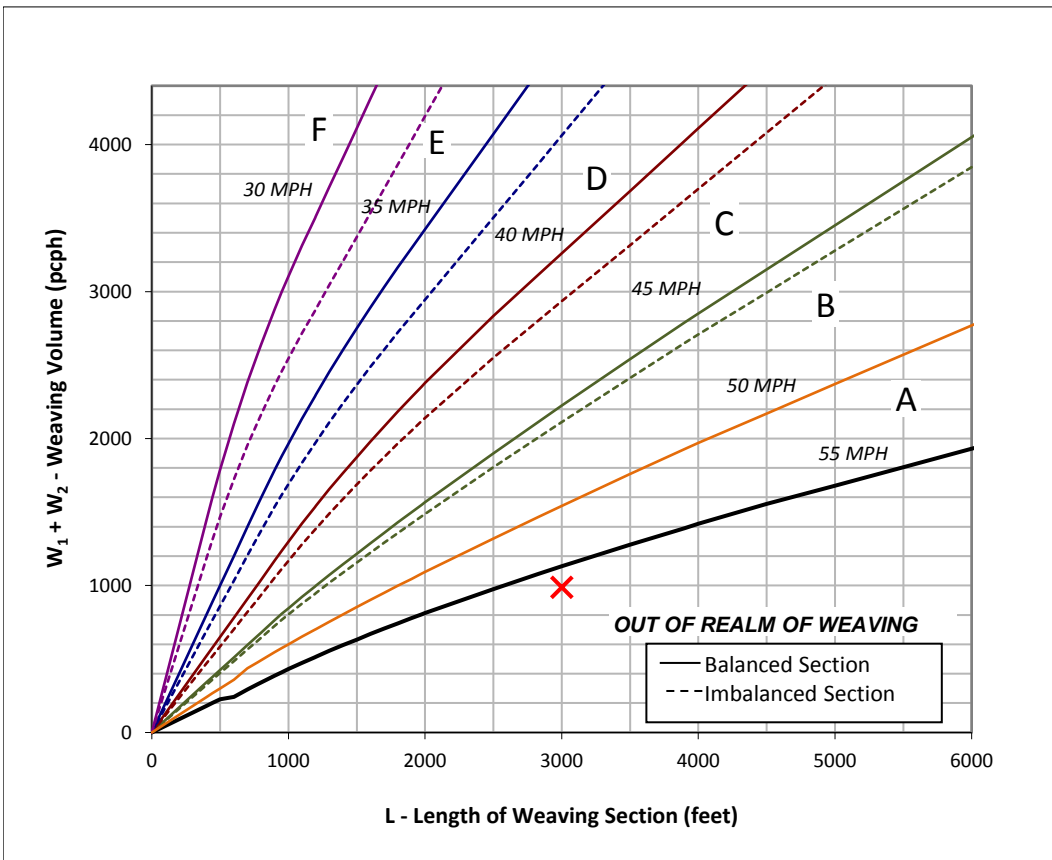
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,000

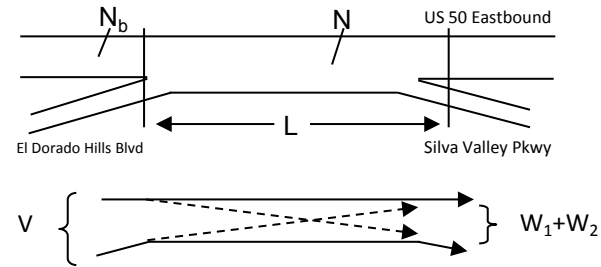
Project Information

Project	Marble Valley EIR
Scenario	Existing PM Peak Hour
Freeway	US 50 Eastbound
On-ramp	El Dorado Hills Blvd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,067	Volume (vph)*	577	Volume (vph)*	408
Truck Percentage	1%	Truck Percentage	1%	Truck Percentage	0%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,087	Volume (pcph)	580	Volume (pcph)	408



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and
Highway Design Manual, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

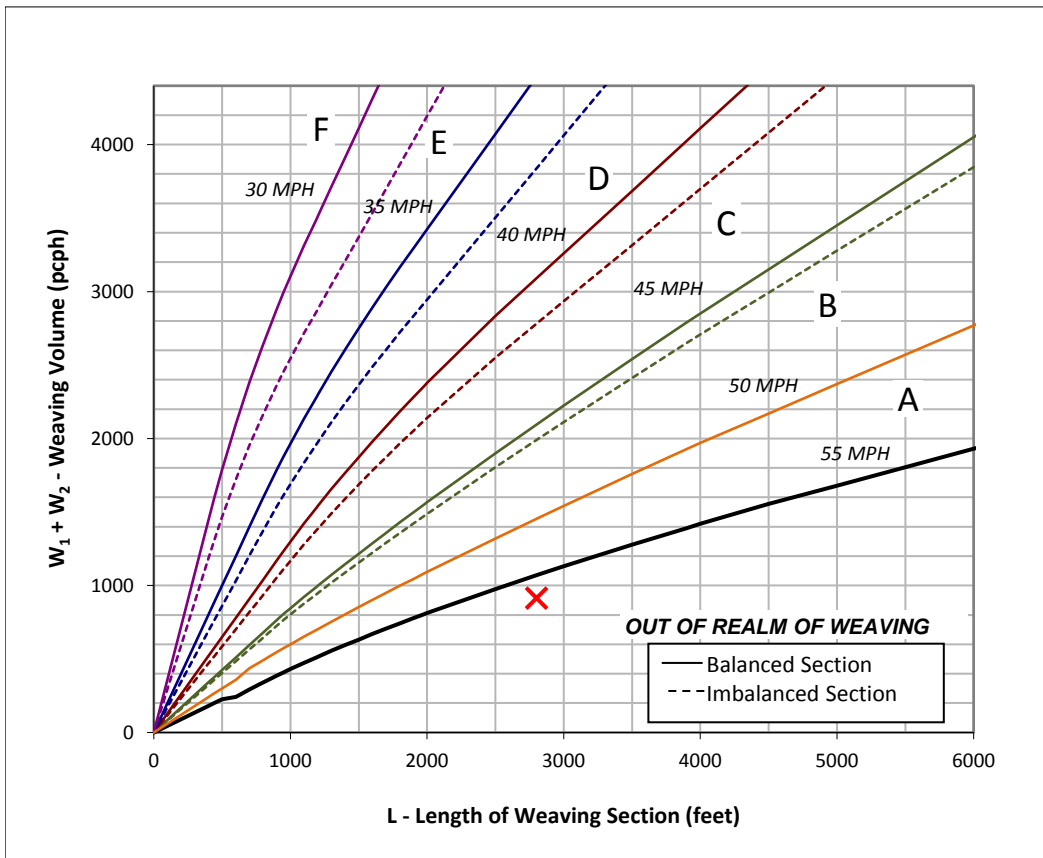
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	2
Length of Weaving Section (feet)	L	2,800

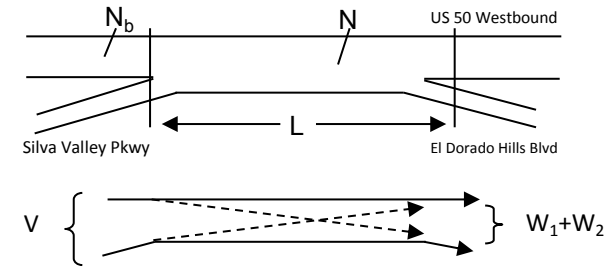
Project Information

Project	Marble Valley EIR
Scenario	Existing AM Peak Hour
Freeway	US 50 Westbound
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,791	Volume (vph)*	430	Volume (vph)*	479
Truck Percentage	2%	Truck Percentage	0%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,829	Volume (pcph)	430	Volume (pcph)	484



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

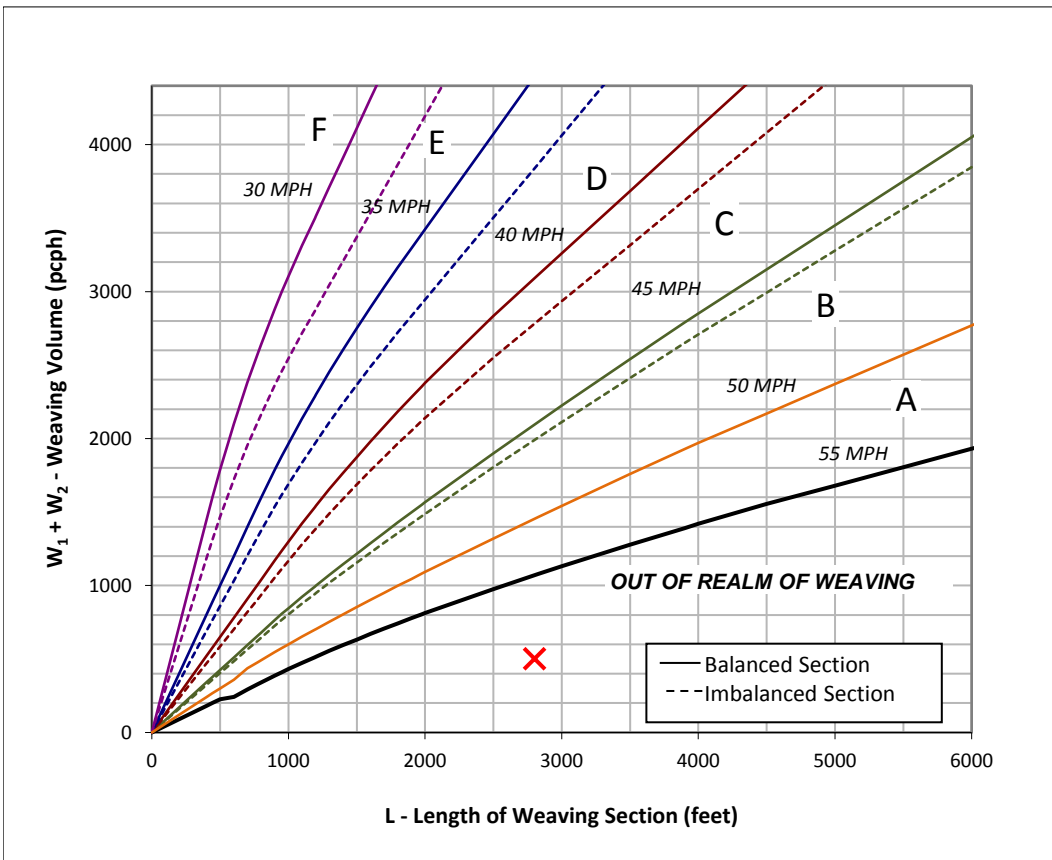
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	2
Length of Weaving Section (feet)	L	2,800

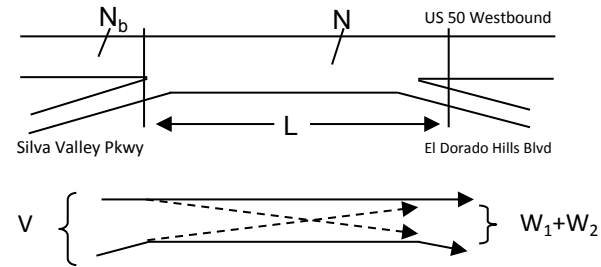
Project Information

Project	Marble Valley EIR
Scenario	Existing PM Peak Hour
Freeway	US 50 Westbound
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	2,162	Volume (vph)*	184	Volume (vph)*	317
Truck Percentage	2%	Truck Percentage	0%	Truck Percentage	1%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	2,184	Volume (pcph)	184	Volume (pcph)	319



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014



























APPENDIX A:

Existing Plus Project Conditions Technical Calculations

DRAFT

HCM Signalized Intersection Capacity Analysis
 1: Bass Lake Road & Serrano Parkway

Existing Plus Project Conditions
 AM Peak Hour



















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	186	136	10	10	563	85	10	10	10	37	10	283	
Future Volume (vph)	186	136	10	10	563	85	10	10	10	37	10	283	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00		1.00	0.98		
Flpb, ped/bikes	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	0.93		1.00	0.85		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1719	1810	1583	1770	1863	1547	1770	1723		1770	1558		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1719	1810	1583	1770	1863	1547	1770	1723		1770	1558		
Peak-hour factor, PHF	0.79	0.79	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86	
Adj. Flow (vph)	235	172	11	11	655	99	11	11	11	43	11	329	
RTOR Reduction (vph)	0	0	4	0	0	51	0	10	0	0	293	0	
Lane Group Flow (vph)	235	172	7	11	655	48	11	12	0	43	47	0	
Confl. Peds. (#/hr)	2					2				2		2	
Heavy Vehicles (%)	5%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	5	2		1	6		8	8		4	4		
Permitted Phases			2			6							
Actuated Green, G (s)	9.0	45.7	45.7	0.7	37.4	37.4	6.2	6.2		8.5	8.5		
Effective Green, g (s)	9.0	45.7	45.7	0.7	37.4	37.4	6.2	6.2		8.5	8.5		
Actuated g/C Ratio	0.12	0.59	0.59	0.01	0.49	0.49	0.08	0.08		0.11	0.11		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	200	1072	938	16	903	750	142	138		195	171		
v/s Ratio Prot	c0.14	0.10		0.01	c0.35		0.01	c0.01		0.02	c0.03		
v/s Ratio Perm			0.00			0.03							
v/c Ratio	1.18	0.16	0.01	0.69	0.73	0.06	0.08	0.09		0.22	0.28		
Uniform Delay, d1	34.0	7.1	6.4	38.1	15.8	10.5	32.8	32.8		31.3	31.5		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	118.8	0.1	0.0	80.1	2.9	0.0	0.2	0.3		0.6	0.9		
Delay (s)	152.9	7.1	6.4	118.2	18.7	10.6	33.0	33.1		31.9	32.4		
Level of Service	F	A	A	F	B	B	C	C		C	C		
Approach Delay (s)		89.0			19.1			33.1			32.3		
Approach LOS		F			B			C			C		
Intersection Summary													
HCM 2000 Control Delay			40.8		HCM 2000 Level of Service					D			
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			77.1		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			68.8%		ICU Level of Service					C			
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

2: Hollow Oak Dr & Bass Lake Road










Existing Plus Project
AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	71	0	12	0	317	34	8	832	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.76	0.76	0.76	0.82	0.82	0.82
Hourly flow rate (vph)	0	0	0	90	0	15	0	417	45	10	1015	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1470	1500	1019	1478	1478	443	1017			464		
vC1, stage 1 conf vol	1036	1036		441	441							
vC2, stage 2 conf vol	434	464		1036	1036							
vCu, unblocked vol	1470	1500	1019	1478	1478	443	1017			464		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	65	100	98	100			99		
cM capacity (veh/h)	254	278	287	256	280	612	670			1096		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	105	0	462	10	1015						
Volume Left	0	90	0	0	10	0						
Volume Right	0	15	0	45	0	0						
cSH	1700	279	1700	1700	1096	1700						
Volume to Capacity	0.00	0.38	0.00	0.27	0.01	0.60						
Queue Length 95th (ft)	0	42	0	0	1	0						
Control Delay (s)	0.0	25.5	0.0	0.0	8.3	0.0						
Lane LOS	A	D			A							
Approach Delay (s)	0.0	25.5	0.0		0.1							
Approach LOS	A	D										
Intersection Summary												
Average Delay				1.7								
Intersection Capacity Utilization			58.4%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Old Bass Lake Road & Bass Lake Road

Existing Plus Project
AM PEAK HOUR

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	2	4	348	913	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.76	0.76	0.83	0.83
Hourly flow rate (vph)	4	8	5	458	1100	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1572	1104	1102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1572	1104	1102			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	99			
cM capacity (veh/h)	120	256	621			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	12	463	1100			
Volume Left	4	5	0			
Volume Right	8	0	0			
cSH	186	621	1700			
Volume to Capacity	0.06	0.01	0.65			
Queue Length 95th (ft)	5	1	0			
Control Delay (s)	25.7	0.2	0.0			
Lane LOS	D	A				
Approach Delay (s)	25.7	0.2	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization		58.7%		ICU Level of Service		B
Analysis Period (min)			15			


















HCM Unsignalized Intersection Capacity Analysis
4: Country Club Drive & Bass Lake Road

Existing Plus Project
AM PEAK HOUR

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗		↘
Volume (veh/h)	281	83	269	159	135	780
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.79	0.79	0.72	0.72	0.83	0.83
Hourly flow rate (vph)	356	105	374	221	163	940
Pedestrians	2		2			2
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1643	378			596	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1643	378			596	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	84			83	
cM capacity (veh/h)	91	667			978	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	461	374	221	1102		
Volume Left	356	0	0	163		
Volume Right	105	0	221	0		
cSH	114	1700	1700	978		
Volume to Capacity	4.06	0.22	0.13	0.17		
Queue Length 95th (ft)	Err	0	0	15		
Control Delay (s)	Err	0.0	0.0	4.4		
Lane LOS	F			A		
Approach Delay (s)	Err	0.0		4.4		
Approach LOS	F					
Intersection Summary						
Average Delay			2137.5			
Intersection Capacity Utilization			93.4%	ICU Level of Service		F
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 5: US 50 WB Ramps & Bass Lake Road

Existing Plus Project
 AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	218	0	97	950	331	0	0	349	712
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.61	0.61	0.61	0.82	0.82	0.82	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	357	0	159	1159	404	0	0	392	800
Pedestrians		2			2			2			2	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3117	3117	396	3117	3117	408	394			406		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3117	3117	396	3117	3117	408	394			406		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	75	0			100		
cM capacity (veh/h)	0	0	652	0	0	637	1159			1151		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2								
Volume Total	516	1562	392	800								
Volume Left	357	1159	0	0								
Volume Right	159	0	0	800								
cSH	0	1159	1700	1700								
Volume to Capacity	4419.09	1.00	0.23	0.47								
Queue Length 95th (ft)	Err	520	0	0								
Control Delay (s)	Err	45.4	0.0	0.0								
Lane LOS	F	E										
Approach Delay (s)	Err	45.4	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay			1600.4									
Intersection Capacity Utilization			136.5%		ICU Level of Service				H			
Analysis Period (min)			15									










HCM Unsignalized Intersection Capacity Analysis
6: US 50 EB Ramps & Bass Lake Road

Existing Plus Project
AM PEAK HOUR

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	186	1	419	0	0	0	0	1095	266	141	426	0	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.74	0.74	0.74	0.92	0.92	0.92	0.61	0.61	0.61	0.71	0.71	0.71	
Hourly flow rate (vph)	251	1	566	0	0	0	0	1795	436	199	600	0	
Pedestrians		2			2			2			2		
Lane Width (ft)		12.0			0.0			12.0			12.0		
Walking Speed (ft/s)		4.0			4.0			4.0			4.0		
Percent Blockage		0			0			0			0		
Right turn flare (veh)													
Median type								None			None		
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1899	3232	604	3581	3014	1120	602			2233			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1899	3232	604	3581	3014	1120	602			2233			
tC, single (s)	7.6	6.6	7.0	7.5	6.5	6.9	4.2			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	0	0	0	0	100	100	100			13			
cM capacity (veh/h)	11	1	435	0	2	201	956			229			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1									
Volume Total	819	1197	1034	799									
Volume Left	251	0	0	199									
Volume Right	566	0	436	0									
cSH	32	1700	1700	229									
Volume to Capacity	25.75	0.70	0.61	0.87									
Queue Length 95th (ft)	Err	0	0	173									
Control Delay (s)	Err	0.0	0.0	74.7									
Lane LOS	F			F									
Approach Delay (s)	Err	0.0		74.7									
Approach LOS	F												
Intersection Summary													
Average Delay			2143.1										
Intersection Capacity Utilization			122.0%		ICU Level of Service					H			
Analysis Period (min)			15										

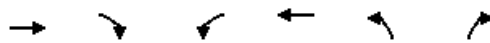
HCM Unsignalized Intersection Capacity Analysis
7: Marble Mountain Road & Marble Valley Road

Existing Plus Project
AM PEAK HOUR

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	19	8	0	1342	837	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.40	0.40	0.60	0.60
Hourly flow rate (vph)	25	11	0	3355	1395	13
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	4761	1406	1410			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4761	1406	1410			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	94	100			
cM capacity (veh/h)	1	170	453			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	3355	1408			
Volume Left	25	0	0			
Volume Right	11	0	13			
cSH	1	453	1700			
Volume to Capacity	25.79	0.00	0.83			
Queue Length 95th (ft)	Err	0	0			
Control Delay (s)	Err	0.0	0.0			
Lane LOS	F					
Approach Delay (s)	Err	0.0	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			75.0			
Intersection Capacity Utilization		81.3%		ICU Level of Service		D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
8: Marble Valley Road & Marble Ridge Road

















Existing Plus Project
AM PEAK HOUR

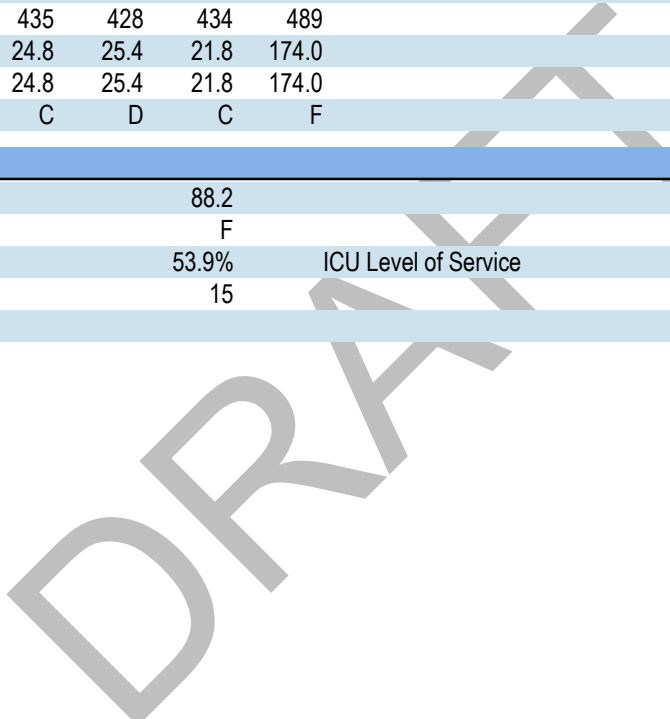


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	839	6	2	1334	8	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.42	0.92	0.92	0.40	0.40
Hourly flow rate (vph)	1998	14	2	1450	20	15
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			2014		3463	2009
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2014		3463	2009
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		0	80
cM capacity (veh/h)			282		7	74
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	2012	1452	35			
Volume Left	0	2	20			
Volume Right	14	0	15			
cSH	1700	282	12			
Volume to Capacity	1.18	0.01	2.92			
Queue Length 95th (ft)	0	1	133			
Control Delay (s)	0.0	1.0	1497.7			
Lane LOS		A	F			
Approach Delay (s)	0.0	1.0	1497.7			
Approach LOS			F			
Intersection Summary						
Average Delay			15.4			
Intersection Capacity Utilization			82.4%	ICU Level of Service		E
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Country Club Drive & Cambridge Road

















Existing Plus Project
 AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	73	67	29	91	72	13	12	161	43	15	393	139
Peak Hour Factor	0.56	0.56	0.56	0.58	0.58	0.58	0.78	0.78	0.78	0.83	0.83	0.83
Hourly flow rate (vph)	130	120	52	157	124	22	15	206	55	18	473	167
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	302	303	277	659								
Volume Left (vph)	130	157	15	18								
Volume Right (vph)	52	22	55	167								
Hadj (s)	0.02	0.09	-0.07	-0.11								
Departure Headway (s)	7.9	7.9	7.8	7.1								
Degree Utilization, x	0.66	0.67	0.60	1.31								
Capacity (veh/h)	435	428	434	489								
Control Delay (s)	24.8	25.4	21.8	174.0								
Approach Delay (s)	24.8	25.4	21.8	174.0								
Approach LOS	C	D	C	F								
Intersection Summary												
Delay			88.2									
HCM Level of Service			F									
Intersection Capacity Utilization			53.9%	ICU Level of Service	A							
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis
 10: Knollwood Drive & Cambridge Road

Existing Plus Project
 AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	253	3	1	0	148	211	5	1	505	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.50	0.50	0.50	0.81	0.81	0.81	0.83	0.83	0.83
Hourly flow rate (vph)	6	0	316	6	2	0	183	260	6	1	608	8
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	1249	1251	617	1564	1252	268	619			269		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1219	1221	617	1572	1223	120	619			121		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	35	75	98	100	81			100		
cM capacity (veh/h)	118	129	488	24	129	829	960			1307		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	322	8	449	618								
Volume Left	6	6	183	1								
Volume Right	316	0	6	8								
cSH	460	30	960	1307								
Volume to Capacity	0.70	0.27	0.19	0.00								
Queue Length 95th (ft)	134	21	18	0								
Control Delay (s)	29.1	164.1	5.2	0.0								
Lane LOS	D	F	A	A								
Approach Delay (s)	29.1	164.1	5.2	0.0								
Approach LOS	D	F										
Intersection Summary												
Average Delay			9.3									
Intersection Capacity Utilization			72.7%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 11: Merrychase Drive & Cambridge Road











Existing Plus Project
 AM PEAK HOUR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	184	215	70	270	141	118	189	231	339	309	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1		4.1	3.5	3.5	4.4	4.4	3.5	4.4	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	0.97		1.00	0.98	1.00	1.00	0.98	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	
Frft		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1844	1541		1844	1558	1770	1863	1544	1770	1786	
Flt Permitted		0.99	1.00		0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1844	1541		1844	1558	1770	1863	1544	1770	1786	
Peak-hour factor, PHF	0.72	0.72	0.72	0.66	0.66	0.66	0.71	0.71	0.71	0.96	0.96	0.96
Adj. Flow (vph)	65	256	299	106	409	214	166	266	325	353	322	100
RTOR Reduction (vph)	0	0	254	0	0	112	0	0	220	0	11	0
Lane Group Flow (vph)	0	321	45	0	515	102	166	266	105	353	411	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Turn Type	Split		Perm	Split		pm+ov	Prot		Perm	Prot		
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)		15.1	15.1		30.2	47.8	12.3	21.4	21.4	17.6	26.7	
Effective Green, g (s)		15.1	15.1		30.2	47.8	12.3	21.4	21.4	17.6	26.7	
Actuated g/C Ratio		0.15	0.15		0.30	0.48	0.12	0.21	0.21	0.18	0.27	
Clearance Time (s)		4.1	4.1		4.1	3.5	3.5	4.4	4.4	3.5	4.4	
Vehicle Extension (s)		1.7	1.7		1.7	1.5	1.5	1.7	1.7	1.5	1.7	
Lane Grp Cap (vph)		277	232		555	742	217	397	329	310	475	
v/s Ratio Prot		c0.17			c0.28	0.02	0.09	0.14		c0.20	c0.23	
v/s Ratio Perm			0.03			0.04			0.07			
v/c Ratio		1.16	0.19		0.93	0.14	0.76	0.67	0.32	1.14	0.87	
Uniform Delay, d1		42.7	37.3		34.0	14.7	42.7	36.3	33.3	41.4	35.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		104.0	0.1		21.5	0.0	13.4	3.5	0.2	94.1	14.7	
Delay (s)		146.7	37.5		55.5	14.8	56.1	39.7	33.5	135.5	49.8	
Level of Service		F	D		E	B	E	D	C	F	D	
Approach Delay (s)		94.0			43.6			40.7			88.8	
Approach LOS		F			D			D			F	
Intersection Summary												
HCM Average Control Delay			65.8				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			100.4				Sum of lost time (s)			11.7		
Intersection Capacity Utilization			73.4%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group


















HCM Unsignalized Intersection Capacity Analysis
 12: US 50 EB Ramps & Cambridge Road

Existing Plus Project
 AM PEAK HOUR

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	161	88	106	377	186	408
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.80	0.80	0.92	0.92
Hourly flow rate (vph)	177	97	132	471	202	443
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)		4				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					783	
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1164	428	204			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1111	258	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	2	86	91			
cM capacity (veh/h)	180	672	1398			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	274	604	646			
Volume Left	177	132	0			
Volume Right	97	0	443			
cSH	263	1398	1700			
Volume to Capacity	1.04	0.09	0.38			
Queue Length 95th (ft)	270	8	0			
Control Delay (s)	107.9	2.5	0.0			
Lane LOS	F	A				
Approach Delay (s)	107.9	2.5	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			20.4			
Intersection Capacity Utilization			79.9%	ICU Level of Service		D
Analysis Period (min)			15			










HCM Unsignalized Intersection Capacity Analysis
 13: Crazy Horse Road & Cambridge Road

Existing Plus Project
 AM PEAK HOUR

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	86	2	0	3	0	47	0	350	4	47	186	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.71	0.71	0.71	0.39	0.39	0.39	0.69	0.69	0.69
Hourly flow rate (vph)	128	3	0	4	0	66	0	897	10	68	270	59
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											1094	
pX, platoon unblocked												
vC, conflicting volume	1379	1317	274	1314	1372	907	331			910		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1379	1317	274	1314	1372	907	331			910		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	98	100	97	100	80	100			91		
cM capacity (veh/h)	90	143	763	123	132	333	1226			747		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	131	70	908	338	59							
Volume Left	128	4	0	68	0							
Volume Right	0	66	10	0	59							
cSH	91	302	1226	747	1700							
Volume to Capacity	1.44	0.23	0.00	0.09	0.03							
Queue Length 95th (ft)	249	22	0	7	0							
Control Delay (s)	332.3	20.5	0.0	3.0	0.0							
Lane LOS	F	C		A								
Approach Delay (s)	332.3	20.5	0.0	2.5								
Approach LOS	F	C										
Intersection Summary												
Average Delay			30.6									
Intersection Capacity Utilization			52.8%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 14: Deer Creek Road & Flying C Road

Existing Plus Project
 AM PEAK HOUR

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	337	0	0	17	15	174
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	366	0	0	18	16	189
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	133	115	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	133	115	207			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	100	100			
cM capacity (veh/h)	858	934	1361			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	366	18	205			
Volume Left	366	0	0			
Volume Right	0	0	189			
cSH	858	1361	1700			
Volume to Capacity	0.43	0.00	0.12			
Queue Length 95th (ft)	54	0	0			
Control Delay (s)	12.3	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.3	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			7.6			
Intersection Capacity Utilization		37.2%		ICU Level of Service		A
Analysis Period (min)			15			

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	489	517	105.6%	47.9	1.7	D
	Through	541	536	99.1%	17.4	0.6	B
	Right Turn	123	122	99.2%	9.6	0.5	A
	Subtotal	1,153	1,175	101.9%	30.0	0.8	C
SB	Left Turn	50	48	96.4%	77.3	6.6	E
	Through	853	843	98.8%	38.6	1.2	D
	Right Turn	662	641	96.9%	31.3	2.5	C
	Subtotal	1,565	1,533	97.9%	36.7	0.7	D
EB	Left Turn	144	147	102.1%	46.3	3.5	D
	Through	78	77	98.5%	51.3	4.6	D
	Right Turn	545	556	102.0%	5.0	0.3	A
	Subtotal	767	780	101.6%	17.4	1.0	B
WB	Left Turn	103	101	97.6%	58.1	2.7	E
	Through	75	76	101.5%	58.1	2.5	E
	Right Turn	39	43	111.0%	8.6	1.9	A
	Subtotal	217	220	101.4%	48.4	2.0	D
Total		3,702	3,707	100.1%	31.2	0.4	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 16




















Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	866	870	100.5%	10.1	0.9	B
	Right Turn	229	224	97.7%	10.1	0.8	B
	Subtotal	1,095	1,094	99.9%	10.1	0.8	B
SB	Left Turn	241	235	97.7%	44.6	1.1	D
	Through	1,262	1,286	101.9%	16.9	0.6	B
	Right Turn						
	Subtotal	1,503	1,521	101.2%	21.2	0.6	C
EB	Left Turn						
	Through						
	Right Turn	1,073	1,014	94.5%	79.3	53.0	E
	Subtotal	1,073	1,014	94.5%	79.3	53.0	E
WB	Left Turn						
	Through						
	Right Turn	287	293	102.0%	9.4	0.5	A
	Subtotal	287	293	102.0%	9.4	0.5	A
Total		3,958	3,922	99.1%	32.3	13.5	C

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US 50 WB Ramps

Existing Plus Project Conditions
 AM Peak Hour













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	453	0	118	58	331	0	0	305	431
Future Volume (veh/h)	0	0	0	453	0	118	58	331	0	0	305	431
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	0	0	1881	1881
Adj Flow Rate, veh/h				521	0	22	75	430	0	0	328	81
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.87	0.87	0.87	0.77	0.77	0.77	0.93	0.93	0.93
Percent Heavy Veh, %				2	2	2	2	2	0	0	1	1
Cap, veh/h				763	0	340	206	1576	0	0	771	345
Arrive On Green				0.21	0.00	0.21	0.12	0.45	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3548	0	1583	1774	3632	0	0	3668	1599
Grp Volume(v), veh/h				521	0	22	75	430	0	0	328	81
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1770	0	0	1787	1599
Q Serve(g_s), s				5.0	0.0	0.4	1.4	2.8	0.0	0.0	2.9	1.6
Cycle Q Clear(g_c), s				5.0	0.0	0.4	1.4	2.8	0.0	0.0	2.9	1.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				763	0	340	206	1576	0	0	771	345
V/C Ratio(X)				0.68	0.00	0.06	0.36	0.27	0.00	0.00	0.43	0.23
Avail Cap(c_a), veh/h				2871	0	1281	1196	4773	0	0	4820	2156
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.4	0.0	11.6	15.1	6.5	0.0	0.0	12.6	12.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.5	0.0	0.2	0.7	1.4	0.0	0.0	1.4	0.7
LnGrp Delay(d),s/veh				13.8	0.0	11.6	15.5	6.5	0.0	0.0	12.7	12.1
LnGrp LOS				B		B	B	A			B	B
Approach Vol, veh/h					543			505			409	
Approach Delay, s/veh					13.7			7.9			12.6	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		23.3			8.5	14.8		13.8				
Change Period (Y+Rc), s		6.8			* 4.2	6.8		5.8				
Max Green Setting (Gmax), s		50.0			* 25	50.0		30.0				
Max Q Clear Time (g_c+I1), s		4.8			3.4	4.9		7.0				
Green Ext Time (p_c), s		1.6			0.1	1.6		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				11.4								
HCM 2010 LOS				B								
Notes												

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US 50 EB Ramps

Existing Plus Project Conditions
 AM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	79	19	147	310	606	152		
Future Volume (veh/h)	79	19	147	310	606	152		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1810	1810	1881	1881	1863	1863		
Adj Flow Rate, veh/h	84	1	196	413	697	38		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.94	0.94	0.75	0.75	0.87	0.87		
Percent Heavy Veh, %	5	5	1	1	2	2		
Cap, veh/h	420	187	612	2024	1013	453		
Arrive On Green	0.12	0.12	0.18	0.57	0.29	0.29		
Sat Flow, veh/h	3447	1538	3476	3668	3632	1583		
Grp Volume(v), veh/h	84	1	196	413	697	38		
Grp Sat Flow(s),veh/h/ln	1723	1538	1738	1787	1770	1583		
Q Serve(g_s), s	0.9	0.0	2.0	2.3	7.1	0.7		
Cycle Q Clear(g_c), s	0.9	0.0	2.0	2.3	7.1	0.7		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	420	187	612	2024	1013	453		
V/C Ratio(X)	0.20	0.01	0.32	0.20	0.69	0.08		
Avail Cap(c_a), veh/h	2133	952	2581	4424	4380	1960		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	16.0	15.6	14.5	4.3	12.8	10.5		
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.0	0.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.0	1.1	3.4	0.3		
LnGrp Delay(d),s/veh	16.1	15.6	14.6	4.3	13.1	10.6		
LnGrp LOS	B	B	B	A	B	B		
Approach Vol, veh/h	85			609	735			
Approach Delay, s/veh	16.1			7.6	13.0			
Approach LOS	B			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		29.7		10.7	11.3	18.4		
Change Period (Y+Rc), s		6.8		5.8	* 4.2	6.8		
Max Green Setting (Gmax), s		50.0		25.0	* 30	50.0		
Max Q Clear Time (g_c+I1), s		4.3		2.9	4.0	9.1		
Green Ext Time (p_c), s		2.5		0.1	0.3	2.5		
Intersection Summary								
HCM 2010 Ctrl Delay			10.9					
HCM 2010 LOS			B					
Notes								

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	105	108	103.0%	41.6	3.7	D
	Through	596	603	101.1%	10.6	1.0	B
	Right Turn	27	26	97.1%	7.3	1.6	A
	Subtotal	728	737	101.2%	15.1	0.8	B
SB	Left Turn	123	120	97.7%	50.3	3.2	D
	Through	1,426	1,407	98.7%	21.3	2.9	C
	Right Turn	28	27	97.7%	20.2	3.7	C
	Subtotal	1,577	1,555	98.6%	23.5	2.7	C
EB	Left Turn	30	29	97.0%	38.5	4.4	D
	Through	17	18	103.3%	42.8	6.8	D
	Right Turn	125	135	108.2%	21.9	2.3	C
	Subtotal	172	182	105.8%	26.6	1.8	C
WB	Left Turn	14	14	103.5%	44.7	8.5	D
	Through	10	12	121.0%	40.6	4.3	D
	Right Turn	46	41	89.9%	8.0	1.2	A
	Subtotal	70	68	97.1%	21.6	3.0	C
Total		2,547	2,541	99.8%	21.3	1.9	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 21

Latrobe Rd/Town Center Blvd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	61	61	99.6%	40.0	4.8	D
	Through	809	814	100.7%	18.2	1.1	B
	Right Turn	58	58	99.1%	4.8	1.2	A
	Subtotal	928	933	100.5%	18.7	1.1	B
SB	Left Turn	475	455	95.8%	37.0	1.8	D
	Through	1,526	1,490	97.6%	13.1	1.0	B
	Right Turn	334	346	103.7%	5.9	0.3	A
	Subtotal	2,335	2,291	98.1%	16.7	1.0	B
EB	Left Turn	18	18	100.3%	37.8	6.7	D
	Through	5	5	90.2%	34.7	9.8	C
	Right Turn	8	7	91.2%	14.1	8.3	B
	Subtotal	31	30	96.3%	31.8	4.7	C
WB	Left Turn	62	61	97.9%	31.5	2.5	C
	Through	28	24	85.0%	31.9	7.5	C
	Right Turn	259	262	101.3%	13.4	0.9	B
	Subtotal	349	347	99.4%	17.8	1.2	B
Total		3,643	3,601	98.8%	17.5	0.9	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 22

























Latrobe Rd/White Rock Rd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	73	75	103.4%	59.9	3.4	E
	Through	535	542	101.4%	23.7	1.6	C
	Right Turn	162	160	98.5%	6.6	0.5	A
	Subtotal	770	778	101.0%	23.7	1.3	C
SB	Left Turn	118	114	96.4%	60.9	1.8	E
	Through	1,115	1,090	97.8%	24.5	1.9	C
	Right Turn	364	362	99.4%	14.1	1.8	B
	Subtotal	1,597	1,566	98.1%	24.8	1.6	C
EB	Left Turn	233	228	97.7%	51.5	1.7	D
	Through	104	101	96.6%	51.5	2.7	D
	Right Turn	42	42	100.3%	25.7	4.5	C
	Subtotal	379	370	97.7%	48.6	1.7	D
WB	Left Turn	373	358	95.8%	58.6	2.3	E
	Through	264	242	91.6%	62.2	3.0	E
	Right Turn	160	163	101.9%	6.5	0.8	A
	Subtotal	797	762	95.7%	48.6	1.6	D
Total		3,543	3,476	98.1%	32.3	1.0	C

HCM Signalized Intersection Capacity Analysis
 1: Bass Lake Road & Serrano Parkway



















Existing Plus Project Conditions
 PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	200	459	10	10	263	54	10	10	10	111	10	155	
Future Volume (vph)	200	459	10	10	263	54	10	10	10	111	10	155	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00		1.00	0.98		
Flpb, ped/bikes	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	0.93		1.00	0.86		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1548	1770	1723		1770	1568		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1548	1770	1723		1770	1568		
Peak-hour factor, PHF	0.96	0.96	0.92	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	208	478	11	11	280	57	11	11	11	121	11	168	
RTOR Reduction (vph)	0	0	6	0	0	41	0	10	0	0	142	0	
Lane Group Flow (vph)	208	478	5	11	280	16	11	12	0	121	37	0	
Confl. Peds. (#/hr)	2					2				2		2	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA		
Protected Phases	5	2		1	6		8	8		4	4		
Permitted Phases			2			6							
Actuated Green, G (s)	15.1	32.7	32.7	0.7	18.3	18.3	6.2	6.2		10.1	10.1		
Effective Green, g (s)	15.1	32.7	32.7	0.7	18.3	18.3	6.2	6.2		10.1	10.1		
Actuated g/C Ratio	0.23	0.50	0.50	0.01	0.28	0.28	0.09	0.09		0.15	0.15		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	406	927	787	18	518	431	167	162		272	241		
v/s Ratio Prot	c0.12	c0.26		0.01	0.15		0.01	c0.01		c0.07	0.02		
v/s Ratio Perm			0.00			0.01							
v/c Ratio	0.51	0.52	0.01	0.61	0.54	0.04	0.07	0.07		0.44	0.15		
Uniform Delay, d1	22.1	11.1	8.3	32.4	20.1	17.3	27.1	27.1		25.3	24.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.1	0.5	0.0	48.7	1.2	0.0	0.2	0.2		1.2	0.3		
Delay (s)	23.2	11.6	8.3	81.0	21.3	17.3	27.3	27.3		26.4	24.4		
Level of Service	C	B	A	F	C	B	C	C		C	C		
Approach Delay (s)		15.0			22.5			27.3			25.2		
Approach LOS		B			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			19.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.47										
Actuated Cycle Length (s)			65.7		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			51.3%		ICU Level of Service					A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis










2: Driveway & Bass Lake Road

Existing Plus Project
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	1	21	0	6	0	668	44	6	408	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.96	0.96	0.96	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	1	28	0	8	0	696	46	6	421	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1141	1179	425	1157	1156	723	423			744		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1141	1179	425	1157	1156	723	423			744		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	84	100	98	100			99		
cM capacity (veh/h)	172	189	627	171	195	425	1135			862		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	1	36	0	742	6	421						
Volume Left	0	28	0	0	6	0						
Volume Right	1	8	0	46	0	0						
cSH	627	197	1700	1700	862	1700						
Volume to Capacity	0.00	0.18	0.00	0.44	0.01	0.25						
Queue Length 95th (ft)	0	16	0	0	1	0						
Control Delay (s)	10.7	27.3	0.0	0.0	9.2	0.0						
Lane LOS	B	D			A							
Approach Delay (s)	10.7	27.3	0.0		0.1							
Approach LOS	B	D										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			53.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Old Bass Lake Road & Bass Lake Road

Existing Plus Project
 PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	3	2	724	436	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	0.93	0.93	0.97	0.97
Hourly flow rate (vph)	1	3	2	778	449	0
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1236	453	451			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1236	453	451			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	193	604	1107			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	4	781	449			
Volume Left	1	2	0			
Volume Right	3	0	0			
cSH	395	1107	1700			
Volume to Capacity	0.01	0.00	0.26			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	14.2	0.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	14.2	0.1	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			50.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
4: Country Club Drive & Bass Lake Road


















Existing Plus Project
PM Peak Hour

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗		↘
Volume (veh/h)	145	52	674	269	56	383
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	169	60	702	280	58	399
Pedestrians	2		2			2
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1222	706			984	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1222	706			984	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	7	86			92	
cM capacity (veh/h)	181	434			701	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	229	702	280	457		
Volume Left	169	0	0	58		
Volume Right	60	0	280	0		
cSH	214	1700	1700	701		
Volume to Capacity	1.07	0.41	0.16	0.08		
Queue Length 95th (ft)	256	0	0	7		
Control Delay (s)	128.7	0.0	0.0	2.4		
Lane LOS	F			A		
Approach Delay (s)	128.7	0.0		2.4		
Approach LOS	F					
Intersection Summary						
Average Delay			18.3			
Intersection Capacity Utilization			80.1%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
















5: US 50 WB Ramps & Bass Lake Road

Existing Plus Project
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	336	1	124	708	819	0	0	283	245
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.77	0.77	0.77	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	436	1	161	738	853	0	0	295	255
Pedestrians		2			2			2			2	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)						2						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2628	2627	299	2627	2627	857	297			855		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2628	2627	299	2627	2627	857	297			855		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	87	55	42			100		
cM capacity (veh/h)	4	10	739	8	10	356	1265			783		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2								
Volume Total	599	1591	295	255								
Volume Left	436	738	0	0								
Volume Right	161	0	0	255								
cSH	11	1265	1700	1700								
Volume to Capacity	52.42	0.58	0.17	0.15								
Queue Length 95th (ft)	Err	99	0	0								
Control Delay (s)	Err	11.7	0.0	0.0								
Lane LOS	F	B										
Approach Delay (s)	Err	11.7	0.0									
Approach LOS	F											
Intersection Summary												
Average Delay			2192.2									
Intersection Capacity Utilization			132.5%		ICU Level of Service				H			
Analysis Period (min)			15									










HCM Unsignalized Intersection Capacity Analysis
6: US 50 EB Ramps & Bass Lake Road

Existing Plus Project
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	598	2	1043	0	0	0	0	929	307	99	520	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.92	0.92	0.92	0.63	0.63	0.63	0.83	0.83	0.83
Hourly flow rate (vph)	616	2	1075	0	0	0	0	1475	487	119	627	0
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2587	2831	631	3664	2587	1722	629			1964		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2587	2831	631	3664	2587	1722	629			1964		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	80	0	0	100	100	100			60		
cM capacity (veh/h)	11	10	480	0	15	110	952			296		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	1694	1962	746									
Volume Left	616	0	119									
Volume Right	1075	487	0									
cSH	30	1700	296									
Volume to Capacity	56.06	1.15	0.40									
Queue Length 95th (ft)	Err	0	47									
Control Delay (s)	Err	0.0	17.5									
Lane LOS	F		C									
Approach Delay (s)	Err	0.0	17.5									
Approach LOS	F											
Intersection Summary												
Average Delay			3850.9									
Intersection Capacity Utilization			214.6%			ICU Level of Service				H		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
7: Marble Mountain Road & Marble Valley Road

Existing Plus Project
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	8	0	0	1228	1544	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.40	0.40	0.58	0.58	0.72	0.72
Hourly flow rate (vph)	20	0	0	2117	2144	26
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	4279	2162	2173			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4279	2162	2173			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	2	56	245			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	20	2117	2171			
Volume Left	20	0	0			
Volume Right	0	0	26			
cSH	2	245	1700			
Volume to Capacity	10.73	0.00	1.28			
Queue Length 95th (ft)	Err	0	0			
Control Delay (s)	Err	0.0	0.0			
Lane LOS	F					
Approach Delay (s)	Err	0.0	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			46.4			
Intersection Capacity Utilization			93.1%	ICU Level of Service		F
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Marble Valley Road & Marble Ridge Road

















Existing Plus Project
PM Peak Hour

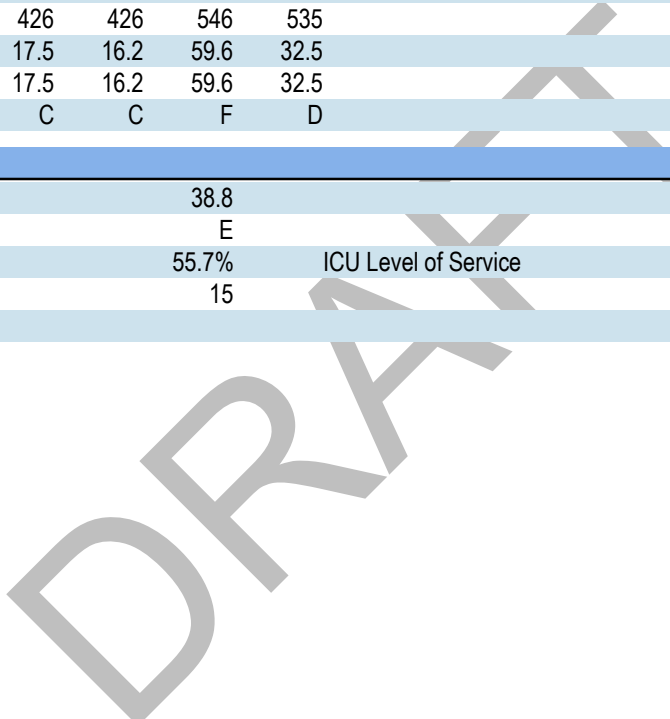


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Volume (veh/h)	1537	7	3	1221	7	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.92	0.92	0.58	0.58
Hourly flow rate (vph)	2650	12	3	1327	12	3
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			2664		3994	2660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2664		3994	2660
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	88
cM capacity (veh/h)			156		3	29
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	2662	1330	16			
Volume Left	0	3	12			
Volume Right	12	0	3			
cSH	1700	156	4			
Volume to Capacity	1.57	0.02	3.88			
Queue Length 95th (ft)	0	2	Err			
Control Delay (s)	0.0	2.8	Err			
Lane LOS		A	F			
Approach Delay (s)	0.0	2.8	Err			
Approach LOS			F			
Intersection Summary						
Average Delay			39.6			
Intersection Capacity Utilization			92.0%	ICU Level of Service		F
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 9: Country Club Drive & Cambridge Road

Existing Plus Project
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	114	48	19	41	76	33	17	400	102	24	244	119
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.95	0.95	0.95	0.88	0.88	0.88
Hourly flow rate (vph)	133	56	22	51	94	41	18	421	107	27	277	135
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	210	185	546	440								
Volume Left (vph)	133	51	18	27								
Volume Right (vph)	22	41	107	135								
Hadj (s)	0.10	-0.04	-0.08	-0.14								
Departure Headway (s)	7.9	7.9	6.5	6.7								
Degree Utilization, x	0.46	0.41	0.98	0.81								
Capacity (veh/h)	426	426	546	535								
Control Delay (s)	17.5	16.2	59.6	32.5								
Approach Delay (s)	17.5	16.2	59.6	32.5								
Approach LOS	C	C	F	D								
Intersection Summary												
Delay			38.8									
HCM Level of Service			E									
Intersection Capacity Utilization			55.7%	ICU Level of Service	B							
Analysis Period (min)			15									

























HCM Unsignalized Intersection Capacity Analysis
 10: Knollwood Drive & Cambridge Road

Existing Plus Project
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	1	147	6	6	2	217	510	2	2	294	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.90	0.90	0.90	0.91	0.91	0.91
Hourly flow rate (vph)	8	1	160	8	8	3	241	567	2	2	323	10
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.75	0.75		0.75	0.75	0.75				0.75		
vC, conflicting volume	1393	1388	332	1547	1391	572	335			571		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1357	1350	332	1562	1355	262	335			261		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	99	77	82	91	100	80			100		
cM capacity (veh/h)	74	90	707	44	89	580	1222			976		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	168	19	810	335								
Volume Left	8	8	241	2								
Volume Right	160	3	2	10								
cSH	494	68	1222	976								
Volume to Capacity	0.34	0.28	0.20	0.00								
Queue Length 95th (ft)	37	25	18	0								
Control Delay (s)	16.0	77.4	4.4	0.1								
Lane LOS	C	F	A	A								
Approach Delay (s)	16.0	77.4	4.4	0.1								
Approach LOS	C	F										
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			75.1%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
11: Merrychase Drive & Cambridge Road











Existing Plus Project
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	76	171	157	205	204	151	436	134	129	235	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1		4.1	3.0	3.0	4.4	4.4	3.0	4.4	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	0.97		1.00	0.98	1.00	1.00	0.98	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	
Frft		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1821	1540		1823	1557	1770	1863	1545	1770	1793	
Flt Permitted		0.98	1.00		0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1821	1540		1823	1557	1770	1863	1545	1770	1793	
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	73	86	194	176	230	229	166	479	147	143	261	71
RTOR Reduction (vph)	0	0	169	0	0	138	0	0	49	0	9	0
Lane Group Flow (vph)	0	159	25	0	406	91	166	479	98	143	323	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Turn Type	Split		Perm	Split		pm+ov	Prot		Perm	Prot		
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)		11.8	11.8		24.4	36.1	12.1	27.6	27.6	11.7	27.2	
Effective Green, g (s)		11.8	11.8		24.4	36.1	12.1	27.6	27.6	11.7	27.2	
Actuated g/C Ratio		0.13	0.13		0.27	0.40	0.13	0.30	0.30	0.13	0.30	
Clearance Time (s)		4.1	4.1		4.1	3.0	3.0	4.4	4.4	3.0	4.4	
Vehicle Extension (s)		1.7	1.7		1.7	1.5	1.5	1.7	1.7	1.5	1.7	
Lane Grp Cap (vph)		236	199		488	617	235	564	468	227	535	
v/s Ratio Prot		c0.09			c0.22	0.02	c0.09	c0.26		0.08	0.18	
v/s Ratio Perm			0.02			0.04			0.06			
v/c Ratio		0.67	0.13		0.83	0.15	0.71	0.85	0.21	0.63	0.60	
Uniform Delay, d1		37.8	35.1		31.4	17.6	37.8	29.8	23.6	37.6	27.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.8	0.1		11.1	0.0	7.7	11.0	0.1	3.9	1.3	
Delay (s)		43.7	35.2		42.5	17.7	45.5	40.8	23.7	41.6	28.7	
Level of Service		D	D		D	B	D	D	C	D	C	
Approach Delay (s)		39.0			33.5			38.6			32.5	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM Average Control Delay			36.0				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			91.1				Sum of lost time (s)			11.2		
Intersection Capacity Utilization			71.3%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 12: US 50 EB Ramps & Cambridge Road

Existing Plus Project
 PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	448	256	108	273	280	283
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	487	278	117	297	304	308
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)		4				
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					783	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	994	462	306			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	942	356	184			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	55	91			
cM capacity (veh/h)	239	622	1259			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	765	414	612			
Volume Left	487	117	0			
Volume Right	278	0	308			
cSH	312	1259	1700			
Volume to Capacity	2.45	0.09	0.36			
Queue Length 95th (ft)	1533	8	0			
Control Delay (s)	688.6	3.0	0.0			
Lane LOS	F	A				
Approach Delay (s)	688.6	3.0	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			294.9			
Intersection Capacity Utilization			87.3%	ICU Level of Service		E
Analysis Period (min)			15			










HCM Unsignalized Intersection Capacity Analysis
 13: Crazy Horse Road & Cambridge Road

Existing Plus Project
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	0	0	4	1	61	0	260	4	61	374	101
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.71	0.71	0.71	0.93	0.93	0.93	0.96	0.96	0.96
Hourly flow rate (vph)	76	0	0	6	1	86	0	280	4	64	390	105
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											1094	
pX, platoon unblocked												
vC, conflicting volume	889	805	394	802	908	286	497			286		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	889	805	394	802	908	286	497			286		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	66	100	100	98	99	89	100			95		
cM capacity (veh/h)	223	299	653	289	261	751	1065			1274		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	76	93	284	453	105							
Volume Left	76	6	0	64	0							
Volume Right	0	86	4	0	105							
cSH	223	667	1065	1274	1700							
Volume to Capacity	0.34	0.14	0.00	0.05	0.06							
Queue Length 95th (ft)	36	12	0	4	0							
Control Delay (s)	29.3	11.3	0.0	1.6	0.0							
Lane LOS	D	B		A								
Approach Delay (s)	29.3	11.3	0.0	1.3								
Approach LOS	D	B										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			57.2%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 14: Deer Creek Road & Flying C Road

Existing Plus Project
 PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	238	0	0	26	19	359
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	259	0	0	28	21	390
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	248	220	413			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	248	220	413			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	100	100			
cM capacity (veh/h)	738	817	1144			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	259	28	411			
Volume Left	259	0	0			
Volume Right	0	0	390			
cSH	738	1144	1700			
Volume to Capacity	0.35	0.00	0.24			
Queue Length 95th (ft)	39	0	0			
Control Delay (s)	12.5	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.5	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization		43.3%		ICU Level of Service		A
Analysis Period (min)			15			

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
PM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	994	921	92.6%	47.7	5.7	D
	Through	1,221	1,107	90.7%	18.9	0.9	B
	Right Turn	279	250	89.5%	15.0	1.1	B
	Subtotal	2,494	2,278	91.3%	30.1	2.3	C
SB	Left Turn	38	34	90.4%	83.2	7.9	F
	Through	571	542	95.0%	46.8	4.0	D
	Right Turn	330	314	95.2%	25.6	2.5	C
	Subtotal	939	891	94.9%	40.8	3.1	D
EB	Left Turn	181	175	96.7%	53.0	3.5	D
	Through	80	74	92.4%	55.5	4.4	E
	Right Turn	293	282	96.2%	4.0	0.8	A
	Subtotal	554	531	95.8%	27.3	2.5	C
WB	Left Turn	203	199	98.0%	60.5	3.2	E
	Through	60	63	105.0%	61.1	4.3	E
	Right Turn	74	67	90.0%	10.8	1.4	B
	Subtotal	337	329	97.5%	50.5	2.5	D
Total		4,324	4,028	93.2%	33.8	1.5	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
PM Peak Hour

Intersection 16




















Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	1,747	1,531	87.6%	26.6	2.2	C
	Right Turn	670	555	82.8%	38.8	3.2	D
	Subtotal	2,417	2,085	86.3%	29.9	2.4	C
SB	Left Turn	264	250	94.7%	43.2	1.6	D
	Through	804	776	96.5%	10.0	0.7	A
	Right Turn						
	Subtotal	1,068	1,026	96.1%	18.1	0.9	B
EB	Left Turn						
	Through						
	Right Turn	705	688	97.6%	27.6	2.9	C
	Subtotal	705	688	97.6%	27.6	2.9	C
WB	Left Turn						
	Through						
	Right Turn	746	719	96.4%	14.8	0.4	B
	Subtotal	746	719	96.4%	14.8	0.4	B
Total		4,936	4,519	91.5%	24.5	1.4	C

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US 50 WB Ramps

Existing Plus Project Conditions
 PM Peak Hour













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	290	0	189	52	890	0	0	233	170
Future Volume (veh/h)	0	0	0	290	0	189	52	890	0	0	233	170
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				322	0	76	56	957	0	0	268	25
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.90	0.90	0.90	0.93	0.93	0.93	0.87	0.87	0.87
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				787	0	351	172	1564	0	0	800	358
Arrive On Green				0.22	0.00	0.22	0.10	0.43	0.00	0.00	0.22	0.22
Sat Flow, veh/h				3619	0	1615	1810	3705	0	0	3705	1615
Grp Volume(v), veh/h				322	0	76	56	957	0	0	268	25
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1805	1615
Q Serve(g_s), s				2.8	0.0	1.4	1.0	7.4	0.0	0.0	2.3	0.4
Cycle Q Clear(g_c), s				2.8	0.0	1.4	1.0	7.4	0.0	0.0	2.3	0.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				787	0	351	172	1564	0	0	800	358
V/C Ratio(X)				0.41	0.00	0.22	0.32	0.61	0.00	0.00	0.33	0.07
Avail Cap(c_a), veh/h				3008	0	1343	1254	5002	0	0	5002	2238
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				12.1	0.0	11.6	15.2	7.9	0.0	0.0	11.8	11.1
Incr Delay (d2), s/veh				0.1	0.0	0.1	0.4	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.4	0.0	0.6	0.5	3.6	0.0	0.0	1.1	0.2
LnGrp Delay(d),s/veh				12.3	0.0	11.7	15.6	8.0	0.0	0.0	11.9	11.1
LnGrp LOS				B		B	B	A			B	B
Approach Vol, veh/h					398			1013			293	
Approach Delay, s/veh					12.1			8.5			11.8	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		22.4			7.6	14.8		13.7				
Change Period (Y+Rc), s		6.8			* 4.2	6.8		5.8				
Max Green Setting (Gmax), s		50.0			* 25	50.0		30.0				
Max Q Clear Time (g_c+I1), s		9.4			3.0	4.3		4.8				
Green Ext Time (p_c), s		2.9			0.0	2.9		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				9.9								
HCM 2010 LOS				A								
Notes												

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US 50 EB Ramps

Existing Plus Project Conditions
 PM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	433	46	379	509	390	133		
Future Volume (veh/h)	433	46	379	509	390	133		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900		
Adj Flow Rate, veh/h	487	10	412	553	411	24		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.89	0.89	0.92	0.92	0.95	0.95		
Percent Heavy Veh, %	0	0	0	0	0	0		
Cap, veh/h	698	312	666	1825	777	348		
Arrive On Green	0.19	0.19	0.19	0.51	0.22	0.22		
Sat Flow, veh/h	3619	1615	3510	3705	3705	1615		
Grp Volume(v), veh/h	487	10	412	553	411	24		
Grp Sat Flow(s),veh/h/ln	1810	1615	1755	1805	1805	1615		
Q Serve(g_s), s	5.2	0.2	4.5	3.7	4.2	0.5		
Cycle Q Clear(g_c), s	5.2	0.2	4.5	3.7	4.2	0.5		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	698	312	666	1825	777	348		
V/C Ratio(X)	0.70	0.03	0.62	0.30	0.53	0.07		
Avail Cap(c_a), veh/h	2165	966	2520	4319	4319	1932		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	15.7	13.7	15.5	6.0	14.5	13.1		
Incr Delay (d2), s/veh	0.5	0.0	0.4	0.0	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.6	0.2	2.2	1.9	2.1	0.2		
LnGrp Delay(d),s/veh	16.2	13.7	15.9	6.1	14.7	13.1		
LnGrp LOS	B	B	B	A	B	B		
Approach Vol, veh/h	497			965	435			
Approach Delay, s/veh	16.2			10.3	14.6			
Approach LOS	B			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		27.9		13.9	12.1	15.8		
Change Period (Y+Rc), s		6.8		5.8	* 4.2	6.8		
Max Green Setting (Gmax), s		50.0		25.0	* 30	50.0		
Max Q Clear Time (g_c+I1), s		5.7		7.2	6.5	6.2		
Green Ext Time (p_c), s		2.1		0.8	0.7	2.1		
Intersection Summary								
HCM 2010 Ctrl Delay			12.8					
HCM 2010 LOS			B					
Notes								

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
PM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	133	122	92.0%	45.1	4.4	D
	Through	1,274	1,175	92.2%	17.5	1.0	B
	Right Turn	69	62	90.4%	13.5	1.9	B
	Subtotal	1,476	1,360	92.1%	19.8	1.1	B
SB	Left Turn	139	130	93.6%	42.2	3.4	D
	Through	784	751	95.8%	15.9	1.3	B
	Right Turn	26	25	95.3%	11.1	3.6	B
	Subtotal	949	906	95.5%	19.6	1.6	B
EB	Left Turn	46	44	96.6%	39.1	3.6	D
	Through	22	22	99.5%	39.8	2.6	D
	Right Turn	96	97	100.7%	7.3	0.9	A
	Subtotal	164	163	99.4%	20.3	1.1	C
WB	Left Turn	55	50	90.6%	32.5	5.5	C
	Through	19	18	92.5%	37.7	5.9	D
	Right Turn	260	251	96.6%	16.1	1.9	B
	Subtotal	334	319	95.4%	19.8	2.2	B
Total		2,923	2,748	94.0%	19.8	1.2	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
PM Peak Hour

Intersection 21

Latrobe Rd/Town Center Blvd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	4	3	69.6%	73.6	36.0	E
	Through	1,436	1,161	80.8%	162.1	9.7	F
	Right Turn	79	55	69.6%	24.5	4.7	C
	Subtotal	1,519	1,218	80.2%	155.7	9.0	F
SB	Left Turn	516	505	97.9%	81.0	16.0	F
	Through	966	936	96.9%	17.9	3.0	B
	Right Turn	27	27	99.2%	2.4	0.5	A
	Subtotal	1,509	1,468	97.3%	39.4	6.9	D
EB	Left Turn	336	309	92.1%	187.5	93.5	F
	Through	24	25	104.0%	47.4	8.9	D
	Right Turn	89	92	103.4%	16.1	2.6	B
	Subtotal	449	426	95.0%	141.0	63.6	F
WB	Left Turn	63	63	100.1%	52.3	6.0	D
	Through	3	3	92.8%	61.7	21.1	E
	Right Turn	639	616	96.4%	36.0	7.9	D
	Subtotal	705	682	96.7%	37.6	7.6	D
Total		4,182	3,794	90.7%	87.7	11.2	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
PM Peak Hour

Intersection 22

Latrobe Rd/White Rock Rd

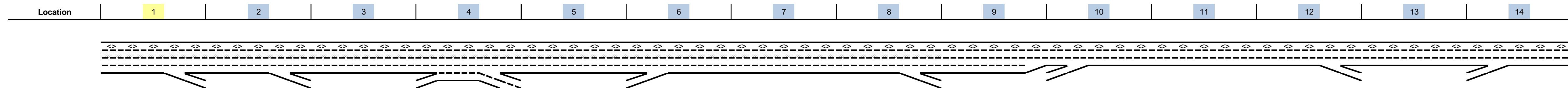
Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	63	48	76.5%	359.3	44.2	F
	Through	932	682	73.2%	413.7	49.5	F
	Right Turn	368	233	63.3%	389.8	45.6	F
	Subtotal	1,363	963	70.7%	405.2	48.3	F
SB	Left Turn	234	228	97.2%	43.8	4.4	D
	Through	648	632	97.6%	21.9	1.5	C
	Right Turn	235	231	98.2%	9.0	1.2	A
	Subtotal	1,117	1,091	97.6%	23.7	1.6	C
EB	Left Turn	374	347	92.7%	85.1	22.6	F
	Through	313	298	95.2%	32.8	2.1	C
	Right Turn	106	108	101.5%	21.5	1.6	C
	Subtotal	793	752	94.8%	55.2	10.8	E
WB	Left Turn	203	196	96.4%	40.5	2.9	D
	Through	146	137	93.6%	49.2	3.8	D
	Right Turn	210	205	97.6%	23.9	7.2	C
	Subtotal	559	537	96.1%	36.3	2.6	D
Total		3,832	3,343	87.2%	142.3	12.1	F

Existing Plus Project Roadway Segments Analysis			Note: County Website Counts are the average of the		Peak Hour Volume		LOS Thresholds			V/ C Ratio		LOS	
Marble Valley EIR													
Bass Lake Rd - Green Valley Rd to US 50 (2 segments) - 4 extra													
Green Valley Rd to Bridlewood Dr	County Website	2A	530	510	850	1540	1650	0.32	0.31	C or better	C or better		
Bridlewood Dr to Serrano Pkwy	Intersection Counts	2A	820	890	850	1540	1650	0.50	0.54	C or better	D		
Serrano Pkwy to Hollow Oak Dr	Intersection Counts	2A	1170	1090	850	1540	1650	0.71	0.66	D	D		
Hollow Oak Dr to Country Club	Intersection Counts	2A	1270	1160	850	1540	1650	0.77	0.70	D	D		
Country Club Dr to US 50	Intersection Counts	2A	1490	1470	850	1540	1650	0.90	0.89	D	D		
Cambridge Rd - Green Valley to US 50 (4 segments)													
Green Valley Rd to Oxford	County Website	2A	410	430	850	1540	1650	0.25	0.26	C or better	C or better		
Oxford to Knollwood Dr	Intersection Counts	2A	710	830	850	1540	1650	0.43	0.50	C or better	C or better		
Knollwood Dr to Country Club	Intersection Counts	2A	770	910	850	1540	1650	0.47	0.55	C or better	D		
Country Club to US 50	Intersection Counts	2A	1120	1130	850	1540	1650	0.68	0.68	D	D		
Cameron Park Dr - Green Valley to US 50 (4 Segments)													
Green Valley to Alhambra	County Website	2A	660	800	850	1540	1650	0.40	0.48	C or better	C or better		
Alhambra to Oxford	County Website	2A	1220	1450	850	1540	1650	0.74	0.88	D	D		
Oxford to Hacienda Dr	Roadway Counts	2A	1080	1615	850	1540	1650	0.65	0.98	D	E		
Hacienda Dr to US 50	County Website	4AU	1090	1670	1760	3070	3130	0.35	0.53	C or better	C or better		
Country Club - Bass Lake to Cameron Park Dr (4 Segments)													
Bass Lake to Merrychase Dr	Intersection Counts	2A	560	430	850	1540	1650	0.34	0.26	C or better	C or better		
Merrychase Dr to Knollwood	County Website	2A	520	410	850	1540	1650	0.32	0.25	C or better	C or better		
Knollwood to Cambridge	Intersection Counts	2A	350	350	850	1540	1650	0.21	0.21	C or better	C or better		
Cambridge to Royal	Intersection Counts	2A	300	320	850	1540	1650	0.18	0.19	C or better	C or better		
Royal to Cameron Park Dr	County Website	2A	220	365	850	1540	1650	0.13	0.22	C or better	C or better		
Durock Rd - US 50 to South Shingle (2 Segments)													
US to to Business Dr	County Website	2A	340	580	850	1540	1650	0.21	0.35	C or better	C or better		
Business Dr to S. Shingle	County Website	2A	330	560	850	1540	1650	0.20	0.34	C or better	C or better		

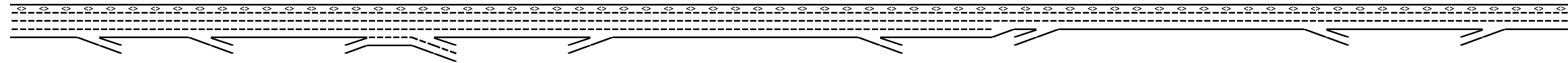
Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50
Alternative: Existing Plus Project Conditions
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

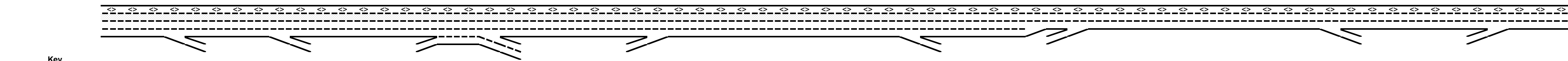


Key
 <-> Express Lane (HOV)
 No Trucks

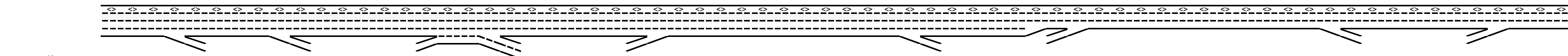
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Define Freeway Segment														
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge
Length (ft)	1,500	850	1,975	3,000	1,575	1,500	2,925	1,500	2,100	1,500	3,300	1,500	1,350	1,500
Accel Length						550				500				500
Decel Length	150	150						150				150		
Mainline Volume	2,838	1,765	1,478	1,478	1,850	1,850	2,149	2,149	1,543	1,543	1,951	1,951	1,702	1,702
On Ramp Volume				470		299				408				513
Off Ramp Volume	1,073	287		98				606				249		
Express Lane Volume	142	88	74	74	93	93	107	107	77	77	98	98	85	85
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,696	1,677	1,404	1,874	1,758	2,057	2,042	2,042	1,466	1,874	1,853	1,853	1,617	2,130
PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
GP Lanes	3	3	3	4	3	3	3	3	3	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.41	0.00	0.14	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	5.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.980	0.980	0.980	0.980	0.980	0.980	0.862	0.980	0.980	0.980	0.980	0.980	0.980	0.980
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	3,161	1,966	1,646	2,197	2,061	2,411	2,722	2,394	1,719	2,197	2,173	2,173	1,896	2,497
GP Flow (pcphpl)	1,054	655	549	549	687	804	907	798	573	1,098	1,087	1,087	948	1,249
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.45	0.28	0.23	0.23	0.29	0.34	0.39	0.34	0.24	0.47	0.46	0.46	0.40	0.53
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Density (pcphpl)	16.2	10.1	8.4	8.5	10.6	12.4	14.0	12.3	8.8	16.9	16.7	16.7	14.6	19.2
LOS	B	A	A	A	A	B	B	B	A	B	B	B	B	C
Calculate Operations for Entering GP Lanes														
GP _N Vol (pcph)				1,681		2,081				1,617				1,931
GP _N Cap (pcph)				7,050		7,050				4,700				4,700
GP _N v/c ratio				0.24		0.30				0.34				0.41
Calculate Operations for Exiting GP Lanes														
GP _{OUT} Vol (pcph)	1,983	1,651		2,090				1,566	1,719			1,897		
GP _{OUT} Cap (pcph)	7,050	7,050		7,050				7,050	4,700			4,700		
GP _{OUT} v/c ratio	0.28	0.23		0.30				0.22	0.37			0.40		



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	142	88	74	74	93	93	107	107	77	77	98	98	85	85
PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	184	114	96	96	120	120	150	139	100	100	126	126	110	110
EL Flow (pcphpl)	184	114	96	96	120	120	150	139	100	100	126	126	110	110
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{LW}														
f _{LC}														
Calc'd FFS														
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _{EX} v/c ratio	0.10	0.07	0.05	0.05	0.07	0.07	0.09	0.08	0.06	0.06	0.07	0.07	0.06	0.06
Calculate On Ramp Flow Rate														
On Volume (vph)				470		299				408				513
PHF				0.92		0.92				0.71				0.92
Total Lanes				1		1				1				1
Terrain				Level		Level				Level				Level
Grade %				0.0%		0.0%				0.0%				0.0%
Grade Length (mi)				0.00		0.00				0.00				0.00
Truck & Bus %				2.0%		3.0%				2.0%				3.0%
RV %				0.0%		0.0%				0.0%				0.0%
E _T				1.5		1.5				1.5				1.5
E _R				1.2		1.2				1.2				1.2
f _{RV}				0.990		0.985				0.990				0.985
f _p				1.00		1.00				1.00				1.00
On Flow (pcph)				516		330				580				566
On Flow (pcphpl)				516		330				580				566
Calculate On Ramp Roadway Operations														
On Ramp Type				Right		Right				Right				Right
On Ramp Speed (mph)				45		25				45				25
On Ramp Cap (pcph)				2,100		1,900				2,100				1,900
On Ramp v/c ratio				0.25		0.17				0.28				0.30

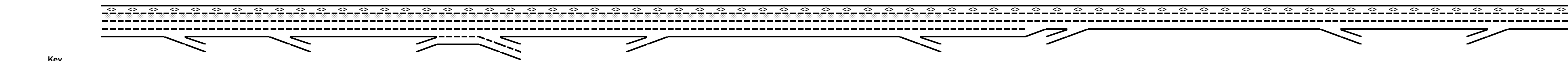


Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	1,073	287		98				606				249		
PHF	0.92	0.92		0.94				0.74				0.91		
Total Lanes	1	1		2				1				1		
Terrain	Level	Level		Level				Level				Level		
Grade %	0.0%	0.0%		0.0%				0.0%				0.0%		
Grade Length (mi)	0.00	0.00		0.00				0.00				0.00		
Truck & Bus %	2.0%	2.0%		5.0%				2.0%				2.0%		
RV %	0.0%	0.0%		0.0%				0.0%				0.0%		
E _T	1.5	1.5		1.5				1.5				1.5		
E _R	1.2	1.2		1.2				1.2				1.2		
f _{RV}	0.990	0.990		0.976				0.990				0.990		
f _p	1.00	1.00		1.00				1.00				1.00		
Off Flow (pcph)	1,178	315		107				827				276		
Off Flow (pcphpl)	1,178	315		53				827				276		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right	Right		Right				Right				Right		
Off Ramp Speed	45	25		45				45				45		
Off Ramp Cap (pcph)	2,100	1,900		4,200				2,100				2,100		
Off Ramp v/c ratio	0.56	0.17		0.03				0.39				0.13		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type		Off					No			No				
Up Distance		2,350												
Up Flow (pcph)		1,178												
Down Type	Off	On					On			On				
Down Distance	850	1,975					3,600			2,100				
Down Flow (pcph)	315	516					580			580				
Calculate Merge Influence Area Operations														
Effective v _p (pcph)							2,081			1,617				1,931
Up Ramp L _{EQ}							3,445							
Down Ramp L _{EQ}							0.593			0.592				0.592
P _{FM} (Eqn 13-3)														
P _{FM} (Eqn 13-4)		#VALUE!												
P _{FM} (Eqn 13-5)	0.646													
P _{FM}							0.593			1.000				1.000
v ₁₂ (pcph)							1,234			1,617				1,931
v ₃ (pcph)							847							
v ₃₄ (pcph)														
v _{12a} (pcph)							1,234			1,617				1,931
v _{R12a} (pcph)							1,564			2,197				2,497
Merge Speed Index							0.31			0.31				0.34
Merge Area Speed							57.8			57.8				57.1
Outer Lanes Volume							847							
Outer Lanes Speed							63.7							
Segment Speed							59.8			57.8				57.1
Merge v/c ratio							0.34			0.48				0.54
Merge Density							14.1			19.2				21.6
Merge LOS							B			B				C



Key
 <-> Express Lane (HOV)
 No Trucks

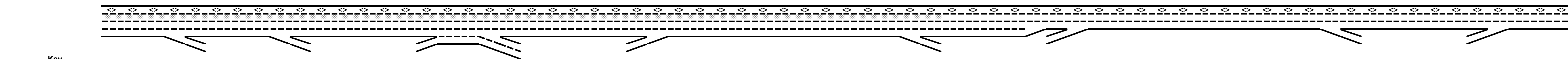
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	3,161	1,966						2,394				2,173		
Up Ramp L_{EQ}		12,767												
Down Ramp L_{EQ}	513	531						756						
P_{FD} (Eqn 13-9)	0.627	0.696						0.662				0.693		
P_{FD} (Eqn 13-10)														
P_{FD} (Eqn 13-11)	0.596													
P_{FD}	0.627	0.696						0.662				1.000		
v_{12} (pcph)	2,421	1,465						1,864				2,173		
v_3 (pcph)	740	501						529						
v_{34} (pcph)														
v_{123} (pcph)	2,421	1,465						1,864				2,173		
Diverge Speed Index	0.40	0.59						0.37				0.32		
Diverge Area Speed	55.7	51.5						56.4				57.6		
Outer Lanes Volume	740	501						529						
Outer Lanes Speed	71.3	71.3						71.3						
Segment Speed	58.7	55.4						59.2				57.6		
Diverge v/c ratio	0.55	0.33						0.42				0.49		
Diverge Density	23.7	15.5						18.9				21.6		
Diverge LOS	C	B						B				C		
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)				68										
PHF				0.87										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				3.5%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.983										
f_p				1.00										
On to Off Flow (pcph)				79										
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)				402										
PHF				0.92										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				2.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.990										
f_p				1.00										
On to ML Flow (pcph)				442										
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)				30										
PHF				0.94										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				5.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.976										
f_p				1.00										
ML to Off Flow (pcph)				33										



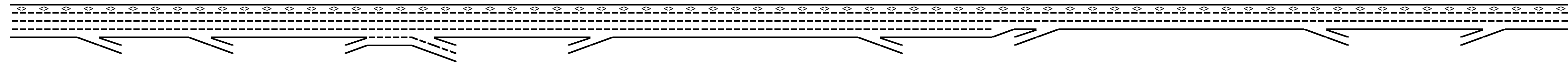
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Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)				1,374										
PHF				0.87										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				4.0%										
RV %				0.0%										
E _T				1.5										
E _R				1.2										
f _{RV}				0.980										
f _p				1.00										
GP to GP Flow (pcph)				1,611										
Calculate Weave Segment Operations														
Weave Type				One-sided										
Weave Length				2,000										
Segment Lanes				3										
Weave Lanes				2										
Weave Flow (pcph)				475										
Non-Weave Flow				1,690										
Segment Flow				2,165										
Max Weave Length				4,736										
Length Check				OK										
Ideal Weave Capacity				2,141										
f _{RV}				0.982										
f _p				0.998										
Capacity Condition 1				6,296										
Capacity Condition 2				10,724										
Weave v/c ratio				0.34										
Interchange Density				2										
Lane Changes On to ML				1										
Lane Changes ML to Off				0										
Lane Changes On to Off				0										
Min Lane Change Rate				442										
Weave LC Rate				1,075										
Non-Weave LC Rate 1				854										
Non-Weave LC Rate 2				2,066										
Non-Weave LC Rate 3				-309										
Segment LC Rate				1,930										
Weave Intensity Factor				0.220										
Weave Speed				56.0										
Non-Weave Speed				58.4										
Segment Speed				57.8										
Weave Density				12.5										
Weave LOS				B										
Summarize Segment Operations														
Segment v/c ratio	0.55	0.33	0.23	0.34	0.29	0.34	0.39	0.42	0.24	0.48	0.46	0.49	0.40	0.54
Segment Density	23.7	15.5	8.4	12.48	10.6	14.1	14.0	18.9	8.8	19.2	16.7	21.6	14.6	21.6
Segment LOS	C	B	A	B	A	B	B	B	A	B	B	C	B	C
Over Capacity														

Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50
Alternative: Existing Plus Project Conditions
Time Period: PM Peak Hour

Data Entry Value
Calculated Value

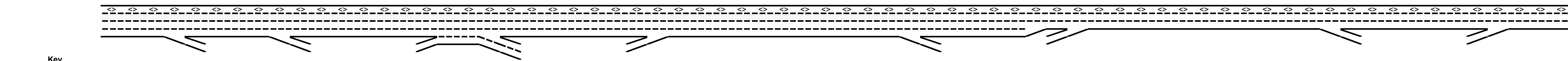


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Define Freeway Segment														
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge
Length (ft)	1,500	850	1,975	3,000	1,575	1,500	2,925	1,500	2,100	1,500	3,300	1,500	1,350	1,500
Accel Length						550				500				500
Decel Length	150	150						150				150		
Mainline Volume	5,662	4,957	4,211	4,211	4,665	4,665	5,177	5,177	3,534	3,534	3,942	3,942	3,238	3,238
On Ramp Volume				933		512				408				391
Off Ramp Volume	705	746		479				1,643				704		
Express Lane Volume	623	545	463	463	513	513	569	569	389	389	434	434	356	356
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	5,039	4,412	3,748	4,681	4,152	4,664	4,608	4,608	3,145	3,553	3,508	3,508	2,882	3,273
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
GP Lanes	3	3	3	4	3	3	3	3	3	2	2	2	2	2
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.41	0.00	0.14	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	6.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.995	0.995	0.995	0.995	0.995	0.995	0.952	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	5,221	4,571	3,883	4,850	4,302	4,832	4,988	4,774	3,259	3,681	3,635	3,635	2,986	3,391
GP Flow (pcphpl)	1,740	1,524	1,294	1,212	1,434	1,611	1,663	1,591	1,086	1,841	1,817	1,817	1,493	1,695
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.74	0.65	0.55	0.52	0.61	0.69	0.71	0.68	0.46	0.78	0.77	0.77	0.64	0.72
Speed (mph)	63.4	64.8	65.0	65.0	65.0	64.4	64.0	64.5	65.0	62.2	62.5	62.5	64.9	63.8
Density (pcphpl)	27.5	23.5	19.9	18.7	22.1	25.0	26.0	24.7	16.7	29.6	29.1	29.1	23.0	26.6
LOS	D	C	C	C	C	C	C	C	B	D	D	D	C	D
Calculate Operations for Entering GP Lanes														
GP _N Vol (pcph)				3,883		4,155				3,185				2,962
GP _N Cap (pcph)				7,050		7,050				4,700				4,700
GP _N v/c ratio				0.55		0.59				0.68				0.63
Calculate Operations for Exiting GP Lanes														
GP _{OUT} Vol (pcph)	4,491	3,798		4,311				3,063	3,259			2,862		
GP _{OUT} Cap (pcph)	7,050	7,050		7,050				7,050	4,700			4,700		
GP _{OUT} v/c ratio	0.64	0.54		0.61				0.43	0.69			0.61		

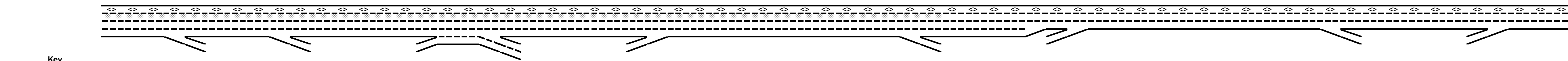


Key
 <-> Express Lane (HOV)
 No Trucks

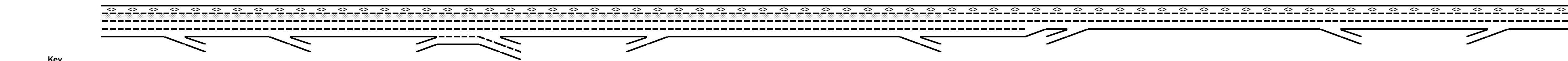
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Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	623	545	463	463	513	513	569	569	389	389	434	434	356	356
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	699	612	520	520	576	576	690	639	436	436	487	487	400	400
EL Flow (pcphpl)	699	612	520	520	576	576	690	639	436	436	487	487	400	400
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{lw}														
f _{lc}														
Calc'd FFS														
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _{sv} v/c ratio	0.40	0.35	0.30	0.30	0.33	0.33	0.39	0.37	0.25	0.25	0.28	0.28	0.23	0.23
Calculate On Ramp Flow Rate														
On Volume (vph)				933		512				408				391
PHF				0.97		0.76				0.83				0.92
Total Lanes				1		1				1				1
Terrain				Level		Level				Level				Level
Grade %				0.0%		0.0%				0.0%				0.0%
Grade Length (mi)				0.00		0.00				0.00				0.00
Truck & Bus %				1.0%		1.0%				2.0%				2.0%
RV %				0.0%		0.0%				0.0%				0.0%
E _T				1.5		1.5				1.5				1.5
E _R				1.2		1.2				1.2				1.2
f _{sv}				0.995		0.995				0.990				0.990
f _p				1.00		1.00				1.00				1.00
On Flow (pcph)				967		677				496				429
On Flow (pcphpl)				967		677				496				429
Calculate On Ramp Roadway Operations														
On Ramp Type				Right		Right				Right				Right
On Ramp Speed (mph)				45		25				45				25
On Ramp Cap (pcph)				2,100		1,900				2,100				1,900
On Ramp v/c ratio				0.46		0.36				0.24				0.23



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	705	746		479				1,643				704		
PHF	0.97	0.97		0.89				0.97				0.92		
Total Lanes	1	1		2				1				1		
Terrain	Level	Level		Level				Level				Level		
Grade %	0.0%	0.0%		0.0%				0.0%				0.0%		
Grade Length (mi)	0.00	0.00		0.00				0.00				0.00		
Truck & Bus %	1.0%	1.0%		0.0%				2.0%				2.0%		
RV %	0.0%	0.0%		0.0%				0.0%				0.0%		
E _T	1.5	1.5		1.5				1.5				1.5		
E _R	1.2	1.2		1.2				1.2				1.2		
f _{RV}	0.995	0.995		1.000				0.990				0.990		
f _p	1.00	1.00		1.00				1.00				1.00		
Off Flow (pcph)	730	773		538				1,711				773		
Off Flow (pcphpl)	730	773		269				1,711				773		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right	Right		Right				Right				Right		
Off Ramp Speed	45	25		45				45				45		
Off Ramp Cap (pcph)	2,100	1,900		4,200				2,100				2,100		
Off Ramp v/c ratio	0.35	0.41		0.13				0.81				0.37		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type		Off					No		No					
Up Distance		2,350												
Up Flow (pcph)		730												
Down Type	Off	On					On		On					
Down Distance	850	1,975					3,600		2,100					
Down Flow (pcph)	773	967					496		496					
Calculate Merge Influence Area Operations														
Effective v _p (pcph)							4,155				3,185			2,962
Up Ramp L _{EQ}							2,947							
Down Ramp L _{EQ}							0.593				0.592			0.592
P _{FM} (Eqn 13-3)														
P _{FM} (Eqn 13-4)		#VALUE!												
P _{FM} (Eqn 13-5)	0.788													
P _{FM}							0.593				1.000			1.000
v ₁₂ (pcph)							2,464				3,185			2,962
v ₃ (pcph)							1,692							
v ₃₄ (pcph)														
v _{12a} (pcph)							2,464				3,185			2,962
v _{R12a} (pcph)							3,141				3,681			3,391
Merge Speed Index							0.38				0.43			0.41
Merge Area Speed							56.2				55.1			55.5
Outer Lanes Volume							1,692							
Outer Lanes Speed							60.7							
Segment Speed							57.7				55.1			55.5
Merge v/c ratio							0.68				0.80			0.74
Merge Density							26.2				30.8			28.6
Merge LOS							C				D			D



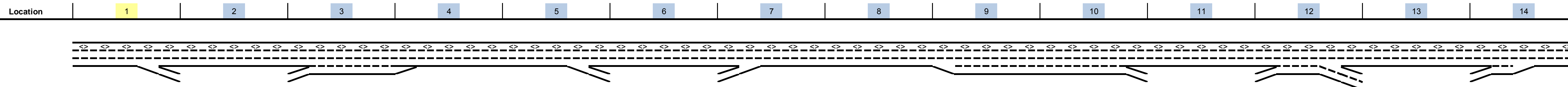
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	5,221	4,571						4,774				3,635		
Up Ramp L_{EQ}		6,222												
Down Ramp L_{EQ}	1,083	1,345						1,357						
P_{FD} (Eqn 13-9)	0.596	0.610						0.562				0.634		
P_{FD} (Eqn 13-10)														
P_{FD} (Eqn 13-11)	0.620													
P_{FD}	0.620	0.610						0.562				1.000		
v_{12} (pcph)	3,514	3,090						3,432				3,635		
v_3 (pcph)	1,707	1,481						1,342						
v_{34} (pcph)														
v_{123} (pcph)	3,514	3,090						3,432				3,635		
Diverge Speed Index	0.36	0.63						0.45				0.37		
Diverge Area Speed	56.6	50.6						54.6				56.5		
Outer Lanes Volume	1,707	1,481						1,342						
Outer Lanes Speed	68.5	69.4						70.0						
Segment Speed	60.0	55.4						58.2				56.5		
Diverge v/c ratio	0.80	0.70						0.78				0.83		
Diverge Density	33.1	29.5						32.4				34.2		
Diverge LOS	D	D						D				D		
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)				174										
PHF				0.97										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				0.5%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.998										
f_p				1.00										
On to Off Flow (pcph)				180										
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)				759										
PHF				0.97										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				1.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				0.995										
f_p				1.00										
On to ML Flow (pcph)				786										
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)				305										
PHF				0.89										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				0.0%										
RV %				0.0%										
E_T				1.5										
E_R				1.2										
f_{HV}				1.000										
f_p				1.00										
ML to Off Flow (pcph)				342										



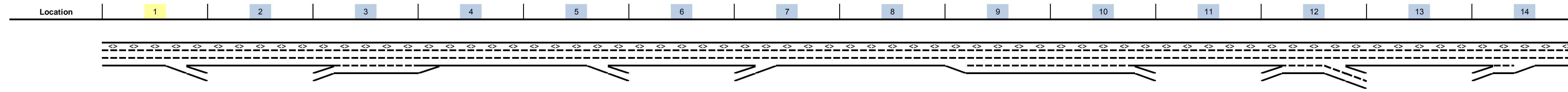
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy on-ramp (loop)	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)				3,443										
PHF				0.97										
Terrain				Level										
Grade %				0.0%										
Grade Length (mi)				0.00										
Truck & Bus %				1.0%										
RV %				0.0%										
E _T				1.5										
E _R				1.2										
f _{RV}				0.995										
f _p				1.00										
GP to GP Flow (pcph)				3,568										
Calculate Weave Segment Operations														
Weave Type				One-sided										
Weave Length				2,000										
Segment Lanes				3										
Weave Lanes				2										
Weave Flow (pcph)				1,128										
Non-Weave Flow				3,748										
Segment Flow				4,876										
Max Weave Length				4,859										
Length Check				OK										
Ideal Weave Capacity				2,131										
f _{RV}				0.995										
f _p				0.999										
Capacity Condition 1				6,360										
Capacity Condition 2				10,318										
Weave v/c ratio				0.76										
Interchange Density				2										
Lane Changes On to ML				1										
Lane Changes ML to Off				0										
Lane Changes On to Off				0										
Min Lane Change Rate				786										
Weave LC Rate				1,419										
Non-Weave LC Rate 1				1,278										
Non-Weave LC Rate 2				2,525										
Non-Weave LC Rate 3				1,660										
Segment LC Rate				3,080										
Weave Intensity Factor				0.318										
Weave Speed				52.9										
Non-Weave Speed				51.5										
Segment Speed				51.9										
Weave Density				31.3										
Weave LOS				D										
Summarize Segment Operations														
Segment v/c ratio	0.80	0.70	0.55	0.76	0.61	0.68	0.71	0.78	0.46	0.80	0.77	0.83	0.64	0.74
Segment Density	33.1	29.5	19.9	31.3	22.1	26.2	26.0	32.4	16.7	30.8	29.1	34.2	23.0	28.6
Segment LOS	D	D	C	D	C	C	C	D	B	D	D	D	C	D
Over Capacity														

Project: Marble Valley EIR
Freeway Corridor: Westbound US 50
Alternative: Existing Plus Project Conditions
Time Period: AM Peak Hour

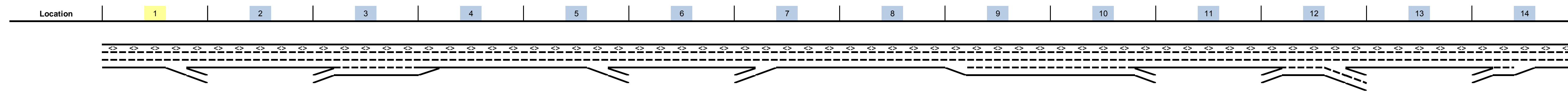
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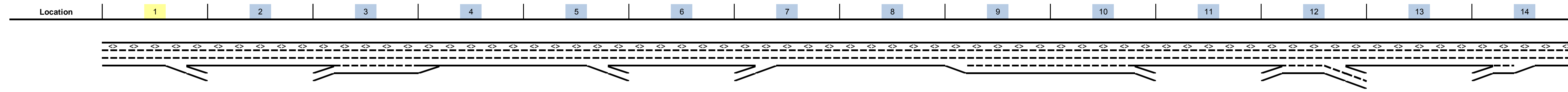
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Define Freeway Segment														
Type	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Basic	Diverge	Basic	Weave	Basic	Merge
Length (ft)	1,500	1,250	1,500	4,900	1,500	2,350	1,500	1,700	500	1,500	2,550	2,800	2,300	1,500
Accel Length			1,500				375							880
Decel Length	150				150					1,500				
Mainline Volume	3,282	2,801	2,801	3,555	3,555	3,240	3,240	4,902	4,902	4,902	4,331	4,331	4,053	4,053
On Ramp Volume			754				1,662					489		1,223
Off Ramp Volume	481				315					571		767		
Express Lane Volume	361	308	308	391	391	356	356	539	539	539	476	476	446	446
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,921	2,493	3,247	3,164	3,164	2,884	4,546	4,363	4,363	4,363	3,855	4,344	3,607	4,830
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
GP Lanes	2	2	3	2	2	2	2	2	3	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _t	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _r	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _w	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	3,123	2,665	3,471	3,383	3,383	3,083	4,860	4,664	4,664	4,664	4,121	4,644	3,857	5,164
GP Flow (pcphpl)	1,561	1,333	1,157	1,691	1,691	1,541	2,430	2,332	1,555	1,555	2,061	1,548	1,928	2,582
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.66	0.57	0.49	0.72	0.72	0.66	1.03	0.99	0.66	0.66	0.88	0.66	0.82	1.10
Speed (mph)	64.6	65.0	65.0	63.8	63.8	64.7	-	52.7	64.7	64.7	58.8	64.7	61.0	-
Density (pcphpl)	24.2	20.5	17.8	26.5	26.5	23.8	-	44.3	24.0	24.0	35.0	23.9	31.6	-
LOS	C	C	B	D	D	C	F	E	C	C	E	C	D	F
Calculate Operations for Entering GP Lanes														
GP _{in} Vol (pcph)			2,678				2,974		4,664			4,118		3,822
GP _{in} Cap (pcph)			4,700				4,700		4,700			4,700		4,700
GP _{in} v/c ratio			0.57				0.63		0.99			0.88		0.81
Calculate Operations for Exiting GP Lanes														
GP _{out} Vol (pcph)	2,387				2,861					4,002			3,802	
GP _{out} Cap (pcph)	4,700				4,700					4,700			4,700	
GP _{out} v/c ratio	0.51				0.61					0.85			0.81	



Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	361	308	308	391	391	356	356	539	539	539	476	476	446	446
PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	410	350	350	444	444	404	404	612	612	612	541	541	506	506
EL Flow (pcphpl)	410	350	350	444	444	404	404	612	612	612	541	541	506	506
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{LW}														
f _{LC}														
Calcd FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Measured FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _N v/c ratio	0.23	0.20	0.20	0.25	0.25	0.23	0.23	0.35	0.35	0.35	0.31	0.31	0.29	0.29
Calculate On Ramp Flow Rate														
On Volume (vph)			754				1,662					489		1,223
PHF			0.96				0.89					0.93		0.92
Total Lanes			1				1					1		1
Terrain			Level				Level					Level		Level
Grade %			0.0%				0.0%					0.0%		0.0%
Grade Length (mi)			0.00				0.00					0.00		0.00
Truck & Bus %			2.0%				2.0%					2.0%		2.0%
RV %			0.0%				0.0%					0.0%		0.0%
E _T			1.5				1.5					1.5		1.5
E _R			1.2				1.2					1.2		1.2
f _{RV}			0.990				0.990					1.000		0.990
f _p			1.00				1.00					1.00		1.00
On Flow (pcph)			793				1,886					526		1,343
On Flow (pcphpl)			793				1,886					526		1,343
Calculate On Ramp Roadway Operations														
On Ramp Type			Right				Right					Right		Right
On Ramp Speed (mph)			25				45					45		45
On Ramp Cap (pcph)			1,900				2,100					2,100		2,100
On Ramp v/c ratio			0.42				0.90					0.25		0.64

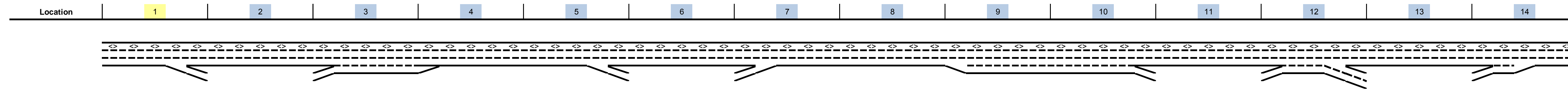


Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	481				315					571		767		
PHF	0.66				0.61					0.87		0.92		
Total Lanes	1				1					1		2		
Terrain	Level				Level					Level		Level		
Grade %	0.0%				0.0%					0.0%		0.0%		
Grade Length (mi)	0.00				0.00					0.00		0.00		
Truck & Bus %	2.0%				2.0%					2.0%		2.0%		
RV %	0.0%				0.0%					0.0%		0.0%		
E_T	1.5				1.5					1.5		1.5		
E_R	1.2				1.2					1.2		1.2		
f_{HV}	0.990				0.990					0.990		0.990		
f_p	1.00				1.00					1.00		1.00		
Off Flow (pcph)	736				522					663		842		
Off Flow (pcphpl)	736				522					663		421		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right				Right					Right		Right		
Off Ramp Speed	45				45					45		25		
Off Ramp Cap (pcph)	2,100				2,100					2,100		3,800		
Off Ramp v/c ratio	0.35				0.25					0.32		0.22		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type			Off							On		Off		
Up Distance			1,250							5,200		2,550		
Up Flow (pcph)			736							1,886		663		
Down Type			Off							On		No		
Down Distance			7,900							1,500				
Down Flow (pcph)			522							1,343				
Calculate Merge Influence Area Operations														
Effective V_p (pcph)			2,678											3,822
Up Ramp L_{EQ}			314											
Down Ramp L_{EQ}			1,931											
P_{FM} (Eqn 13-3)			0.620							0.588				0.602
P_{FM} (Eqn 13-4)			0.678											
P_{FM} (Eqn 13-5)			0.566											
P_{FM}			1.000							1.000				1.000
V_{12} (pcph)			2,678							2,974				3,822
V_3 (pcph)														
V_4 (pcph)														
V_{12a} (pcph)			2,678							2,974				3,822
V_{12b} (pcph)			3,471							4,860				5,164
Merge Speed Index			0.37							-				-
Merge Area Speed			56.5							-				-
Outer Lanes Volume														
Outer Lanes Speed														
Segment Speed			56.5											
Merge v/c ratio			0.75							1.06				1.12
Merge Density			22.8							-				-
Merge LOS			C							F				F



Key
 <-> Express Lane (HOV)
 No Trucks

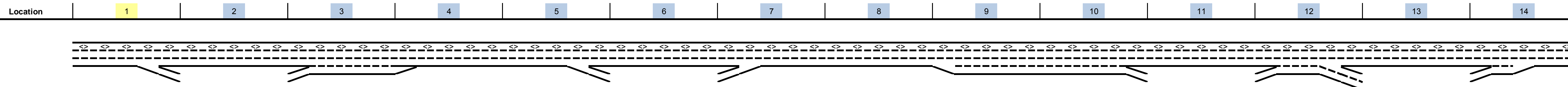
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	3,123				3,383					4,664				
Up Ramp L_{EO}										14,746				
Down Ramp L_{EO}										1,776				
P_{FD} (Eqn 13-9)	0.648				0.651					0.613				
P_{FD} (Eqn 13-10)										0.613				
P_{FD} (Eqn 13-11)			#VALUE!											
P_{FD}	1.000				1.000					0.613				
v_{12} (pcph)	3,123				3,383					3,115				
v_2 (pcph)										1,549				
v_{2s} (pcph)														
v_{2sa} (pcph)	3,123				3,383					3,115				
Diverge Speed Index	0.36				0.34					0.36				
Diverge Area Speed	56.6				57.1					56.8				
Outer Lanes Volume										1,549				
Outer Lanes Speed										69.2				
Segment Speed	56.6				57.1					60.4				
Diverge v/c ratio	0.71				0.77					0.71				
Diverge Density	29.8				32.0					17.5				
Diverge LOS	D				D					B				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)													91	
PHF													0.94	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													1.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.995	
f_p													1.00	
On to Off Flow (pcph)													98	
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)													398	
PHF													0.93	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													0.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													1.000	
f_p													1.00	
On to ML Flow (pcph)													427	
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)													676	
PHF													0.92	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													2.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.990	
f_p													1.00	
ML to Off Flow (pcph)													742	
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)													3,179	
PHF													0.94	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													1.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.995	
f_p													1.00	
GP to GP Flow (pcph)													3,399	



Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Weave Segment Operations														
Weave Type												One-sided		
Weave Length												1,800		
Segment Lanes												2		
Weave Lanes												2		
Weave Flow (pcph)												1,169		
Non-Weave Flow												3,497		
Segment Flow												4,666		
Max Weave Length												5,060		
Length Check												OK		
Ideal Weave Capacity												2,101		
f_{wv}												0.995		
f_p												1.000		
Capacity Condition 1												4,179		
Capacity Condition 2												9,527		
Weave v/c ratio												1.11		
Interchange Density												1		
Lane Changes On to ML												1		
Lane Changes ML to Off												0		
Lane Changes On to Off												0		
Min Lane Change Rate												427		
Weave LC Rate												1,082		
Non-Weave LC Rate 1												1,311		
Non-Weave LC Rate 2												2,469		
Non-Weave LC Rate 3												116		
Segment LC Rate												2,393		
Weave Intensity Factor												0.283		
Weave Speed												54.0		
Non-Weave Speed												50.7		
Segment Speed												51.5		
Weave Density												-		
Weave LOS												F		
Summarize Segment Operations														
Segment v/c ratio	0.71	0.57	0.75	0.72	0.77	0.66	1.06	0.99	0.66	0.71	0.88	1.11	0.82	1.12
Segment Density	29.8	20.5	22.8	26.5	32.0	23.8	-	44.3	24.0	17.5	35.0	-	31.6	-
Segment LOS	D	C	C	D	D	C	F	E	C	B	E	F	D	F
Over Capacity							Segment GP Lanes Merge					Weave		Segment GP Lanes Merge

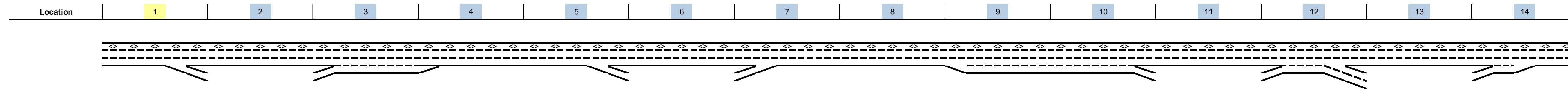
Project: Marble Valley EIR
Freeway Corridor: Westbound US 50
Alternative: Existing Plus Project Conditions
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

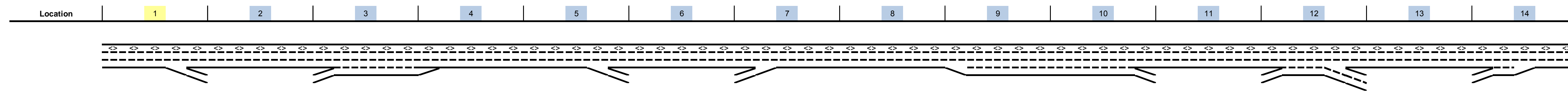


Key
 <-> Express Lane (HOV)
 No Trucks

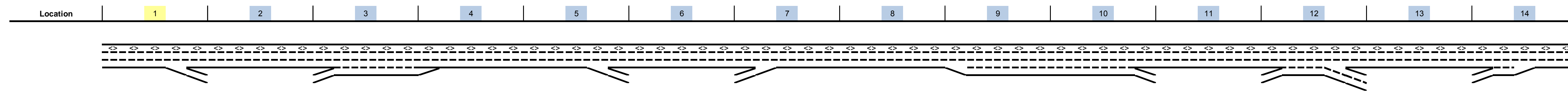
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd on-ramp
Define Freeway Segment														
Type	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Basic	Diverge	Basic	Weave	Basic	Merge
Length (ft)	1,500	1,250	1,500	4,900	1,500	2,350	1,500	1,700	500	1,500	2,550	2,800	2,300	1,500
Accel Length			1,500				375							880
Decel Length	150				150					1,500				
Mainline Volume	3,282	2,801	2,801	3,555	3,555	3,240	3,240	4,902	4,902	4,902	4,331	4,331	4,053	4,053
On Ramp Volume			754				1,662					489		1,223
Off Ramp Volume	481				315					571		767		
Express Lane Volume	361	308	308	391	391	356	356	539	539	539	476	476	446	446
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,921	2,493	3,247	3,164	3,164	2,884	4,546	4,363	4,363	4,363	3,855	4,344	3,607	4,830
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
GP Lanes	2	2	3	2	2	2	2	2	3	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _t	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _r	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _w	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	3,123	2,665	3,471	3,383	3,383	3,083	4,860	4,664	4,664	4,664	4,121	4,644	3,857	5,164
GP Flow (pcphpl)	1,561	1,333	1,157	1,691	1,691	1,541	2,430	2,332	1,555	1,555	2,061	1,548	1,928	2,582
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.66	0.57	0.49	0.72	0.72	0.66	1.03	0.99	0.66	0.66	0.88	0.66	0.82	1.10
Speed (mph)	64.6	65.0	65.0	63.8	63.8	64.7	-	52.7	64.7	64.7	58.8	64.7	61.0	-
Density (pcphpl)	24.2	20.5	17.8	26.5	26.5	23.8	-	44.3	24.0	24.0	35.0	23.9	31.6	-
LOS	C	C	B	D	D	C	F	E	C	C	E	C	D	F
Calculate Operations for Entering GP Lanes														
GP _{in} Vol (pcph)			2,678				2,974		4,664			4,118		3,822
GP _{in} Cap (pcph)			4,700				4,700		4,700			4,700		4,700
GP _{in} v/c ratio			0.57				0.63		0.99			0.88		0.81
Calculate Operations for Exiting GP Lanes														
GP _{out} Vol (pcph)	2,387				2,861					4,002			3,802	
GP _{out} Cap (pcph)	4,700				4,700					4,700			4,700	
GP _{out} v/c ratio	0.51				0.61					0.85			0.81	



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Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	361	308	308	391	391	356	356	539	539	539	476	476	446	446
PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	410	350	350	444	444	404	404	612	612	612	541	541	506	506
EL Flow (pcphpl)	410	350	350	444	444	404	404	612	612	612	541	541	506	506
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{LW}														
f _{LC}														
Calcd FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Measured FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _N v/c ratio	0.23	0.20	0.20	0.25	0.25	0.23	0.23	0.35	0.35	0.35	0.31	0.31	0.29	0.29
Calculate On Ramp Flow Rate														
On Volume (vph)			754				1,662					489		1,223
PHF			0.96				0.89					0.93		0.92
Total Lanes			1				1					1		1
Terrain			Level				Level					Level		Level
Grade %			0.0%				0.0%					0.0%		0.0%
Grade Length (mi)			0.00				0.00					0.00		0.00
Truck & Bus %			2.0%				2.0%					2.0%		2.0%
RV %			0.0%				0.0%					0.0%		0.0%
E _T			1.5				1.5					1.5		1.5
E _R			1.2				1.2					1.2		1.2
f _{RV}			0.990				0.990					1.000		0.990
f _p			1.00				1.00					1.00		1.00
On Flow (pcph)			793				1,886					526		1,343
On Flow (pcphpl)			793				1,886					526		1,343
Calculate On Ramp Roadway Operations														
On Ramp Type			Right				Right					Right		Right
On Ramp Speed (mph)			25				45					45		45
On Ramp Cap (pcph)			1,900				2,100					2,100		2,100
On Ramp v/c ratio			0.42				0.90					0.25		0.64

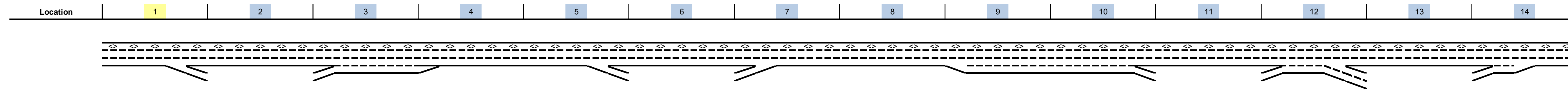


Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	481				315					571		767		
PHF	0.66				0.61					0.87		0.92		
Total Lanes	1				1					1		2		
Terrain	Level				Level					Level		Level		
Grade %	0.0%				0.0%					0.0%		0.0%		
Grade Length (mi)	0.00				0.00					0.00		0.00		
Truck & Bus %	2.0%				2.0%					2.0%		2.0%		
RV %	0.0%				0.0%					0.0%		0.0%		
E_T	1.5				1.5					1.5		1.5		
E_R	1.2				1.2					1.2		1.2		
f_{HV}	0.990				0.990					0.990		0.990		
f_p	1.00				1.00					1.00		1.00		
Off Flow (pcph)	736				522					663		842		
Off Flow (pcphpl)	736				522					663		421		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right				Right					Right		Right		
Off Ramp Speed	45				45					45		25		
Off Ramp Cap (pcph)	2,100				2,100					2,100		3,800		
Off Ramp v/c ratio	0.35				0.25					0.32		0.22		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type			Off							On		Off		
Up Distance			1,250							5,200		2,550		
Up Flow (pcph)			736							1,886		663		
Down Type			Off							On		No		
Down Distance			7,900							1,500				
Down Flow (pcph)			522							1,343				
Calculate Merge Influence Area Operations														
Effective V_p (pcph)			2,678											3,822
Up Ramp L_{EQ}			314											
Down Ramp L_{EQ}			1,931											
P_{FM} (Eqn 13-3)			0.620							0.588				0.602
P_{FM} (Eqn 13-4)			0.678											
P_{FM} (Eqn 13-5)			0.566											
P_{FM}			1.000							1.000				1.000
V_{12} (pcph)			2,678							2,974				3,822
V_3 (pcph)														
V_4 (pcph)														
V_{12a} (pcph)			2,678							2,974				3,822
V_{12b} (pcph)			3,471							4,860				5,164
Merge Speed Index			0.37							-				-
Merge Area Speed			56.5							-				-
Outer Lanes Volume														
Outer Lanes Speed														
Segment Speed			56.5											
Merge v/c ratio			0.75							1.06				1.12
Merge Density			22.8							-				-
Merge LOS			C							F				F



Key
 <-> Express Lane (HOV)
 No Trucks

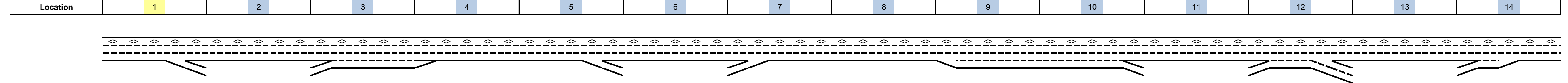
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	3,123				3,383					4,664				
Up Ramp L_{EO}										14,746				
Down Ramp L_{EO}										1,776				
P_{FD} (Eqn 13-9)	0.648				0.651					0.613				
P_{FD} (Eqn 13-10)										0.613				
P_{FD} (Eqn 13-11)			#VALUE!											
P_{FD}	1.000				1.000					0.613				
v_{12} (pcph)	3,123				3,383					3,115				
v_2 (pcph)										1,549				
v_{24} (pcph)														
v_{24} (pcph)	3,123				3,383					3,115				
Diverge Speed Index	0.36				0.34					0.36				
Diverge Area Speed	56.6				57.1					56.8				
Outer Lanes Volume										1,549				
Outer Lanes Speed										69.2				
Segment Speed	56.6				57.1					60.4				
Diverge v/c ratio	0.71				0.77					0.71				
Diverge Density	29.8				32.0					17.5				
Diverge LOS	D				D					B				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)													91	
PHF													0.94	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													1.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.995	
f_p													1.00	
On to Off Flow (pcph)													98	
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)													398	
PHF													0.93	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													0.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													1.000	
f_p													1.00	
On to ML Flow (pcph)													427	
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)													676	
PHF													0.92	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													2.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.990	
f_p													1.00	
ML to Off Flow (pcph)													742	
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)													3,179	
PHF													0.94	
Terrain													Level	
Grade %													0.0%	
Grade Length (mi)													0.00	
Truck & Bus %													1.0%	
RV %													0.0%	
E_T													1.5	
E_R													1.2	
f_{RV}													0.995	
f_p													1.00	
GP to GP Flow (pcph)													3,399	



Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Weave Segment Operations														
Weave Type												One-sided		
Weave Length												1,800		
Segment Lanes												2		
Weave Lanes												2		
Weave Flow (pcph)												1,169		
Non-Weave Flow												3,497		
Segment Flow												4,666		
Max Weave Length												5,060		
Length Check												OK		
Ideal Weave Capacity												2,101		
f_{wv}												0.995		
f_p												1.000		
Capacity Condition 1												4,179		
Capacity Condition 2												9,527		
Weave v/c ratio												1.11		
Interchange Density												1		
Lane Changes On to ML												1		
Lane Changes ML to Off												0		
Lane Changes On to Off												0		
Min Lane Change Rate												427		
Weave LC Rate												1,082		
Non-Weave LC Rate 1												1,311		
Non-Weave LC Rate 2												2,469		
Non-Weave LC Rate 3												116		
Segment LC Rate												2,393		
Weave Intensity Factor												0.283		
Weave Speed												54.0		
Non-Weave Speed												50.7		
Segment Speed												51.5		
Weave Density												-		
Weave LOS												F		
Summarize Segment Operations														
Segment v/c ratio	0.71	0.57	0.75	0.72	0.77	0.66	1.06	0.99	0.66	0.71	0.88	1.11	0.82	1.12
Segment Density	29.8	20.5	22.8	26.5	32.0	23.8	-	44.3	24.0	17.5	35.0	-	31.6	-
Segment LOS	D	C	C	D	D	C	F	E	C	B	E	F	D	F
Over Capacity							Segment GP Lanes Merge					Weave		Segment GP Lanes Merge

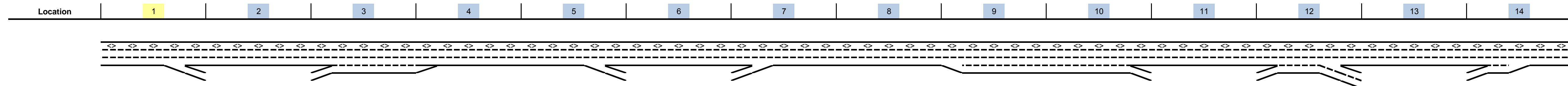
Project: Marble Valley EIR
Freeway Corridor: Westbound US 50
Alternative: Existing Plus Project Conditions
Time Period: PM Peak Hour

Data Entry Value
Calculated Value

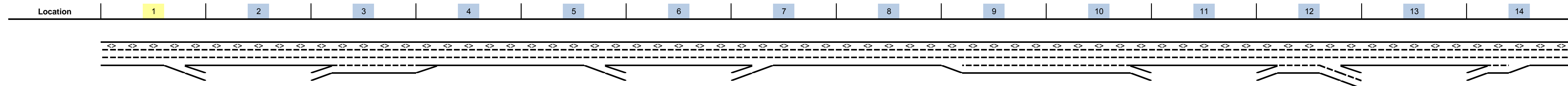


Key
 <-> Express Lane (HOV)
 No Trucks

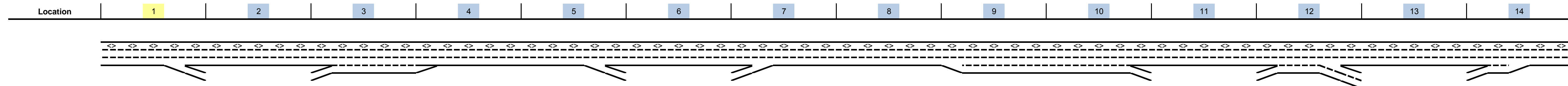
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Define Freeway Segment														
Type	Diverge	Basic	Merge	Basic	Diverge	Basic	Merge	Basic	Basic	Diverge	Basic	Weave	Basic	Merge
Length (ft)	1,500	1,250	1,500	4,900	1,500	2,350	1,500	1,700	500	1,500	2,550	2,800	2,300	1,500
Accel Length			1,500					375						880
Decel Length	150				150					1,500				
Mainline Volume	2,865	2,299	2,299	2,638	2,638	2,177	2,177	3,131	3,131	3,131	2,652	2,652	2,320	2,320
On Ramp Volume			339				954					222		1,384
Off Ramp Volume	566				461					479		554		
Express Lane Volume	229	184	184	211	211	174	174	250	250	250	212	212	186	186
EL On Ramp Volume														
EL Off Ramp Volume														
Calculate Flow Rate in General Purpose Lanes (GP)														
GP Volume (vph)	2,636	2,115	2,454	2,427	2,427	2,003	2,957	2,881	2,881	2,881	2,440	2,662	2,134	3,518
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
GP Lanes	2	2	3	2	2	2	2	2	3	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	2,773	2,225	2,582	2,553	2,553	2,107	3,111	3,031	3,031	3,031	2,567	2,800	2,246	3,702
GP Flow (pcphpl)	1,387	1,113	861	1,277	1,277	1,054	1,555	1,515	1,010	1,010	1,283	933	1,123	1,851
Calculate Speed in General Purpose Lanes														
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes														
v/c ratio	0.59	0.47	0.37	0.54	0.54	0.45	0.66	0.64	0.43	0.43	0.55	0.40	0.48	0.79
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	64.7	64.8	65.0	65.0	65.0	65.0	65.0	62.1
Density (pcphpl)	21.3	17.1	13.2	19.6	19.6	16.2	24.1	23.4	15.5	15.5	19.7	14.4	17.3	29.8
LOS	C	B	B	C	C	B	C	C	B	B	C	B	B	D
Calculate Operations for Entering GP Lanes														
GP _{IN} Vol (pcph)			2,201				2,107		3,031			2,554		2,268
GP _{IN} Cap (pcph)			4,700				4,700		4,700			4,700		4,700
GP _{IN} v/c ratio			0.47				0.45		0.64			0.54		0.48
Calculate Operations for Exiting GP Lanes														
GP _{OUT} Vol (pcph)	2,131				1,949					2,498			2,226	
GP _{OUT} Cap (pcph)	4,700				4,700					4,700			4,700	
GP _{OUT} v/c ratio	0.45				0.41					0.53			0.47	



Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate Flow Rate in Express Lanes (EL)														
EL Volume (vph)	229	184	184	211	211	174	174	250	250	250	212	212	186	186
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	257	206	206	237	237	195	195	281	281	281	238	238	208	208
EL Flow (pcphpl)	257	206	206	237	237	195	195	281	281	281	238	238	208	208
Calculate Speed in Express Lanes														
Lane Width (ft)														
Shoulder Width														
TRD														
f _{LW}														
f _{LC}														
Calc'd FFS														
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes														
EL _{EX} v/c ratio	0.15	0.12	0.12	0.14	0.14	0.11	0.11	0.16	0.16	0.16	0.14	0.14	0.12	0.12
Calculate On Ramp Flow Rate														
On Volume (vph)			339				954					222		1,384
PHF			0.9				0.96					0.9		0.97
Total Lanes			1				1					1		1
Terrain			Level				Level					Level		Level
Grade %			0.0%				0.0%					0.0%		0.0%
Grade Length (mi)			0.00				0.00					0.00		0.00
Truck & Bus %			2.0%				2.0%					0.0%		1.0%
RV %			0.0%				0.0%					0.0%		0.0%
E _T			1.5				1.5					1.5		1.5
E _R			1.2				1.2					1.2		1.2
f _{RV}			0.990				0.990					1.000		0.995
f _p			1.00				1.00					1.00		1.00
On Flow (pcph)			380				1,004					247		1,434
On Flow (pcphpl)			380				1,004					247		1,434
Calculate On Ramp Roadway Operations														
On Ramp Type			Right				Right					Right		Right
On Ramp Speed (mph)			25				45					45		45
On Ramp Cap (pcph)			1,900				2,100					2,100		2,100
On Ramp v/c ratio			0.20				0.48					0.12		0.68

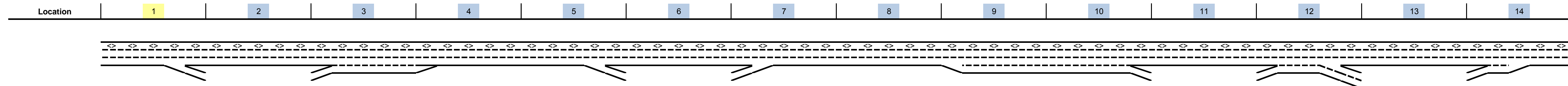


Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Key														
\leftrightarrow Express Lane (HOV)														
No Trucks														
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate Off Ramp Flow Rate														
Off Volume (vph)	566				461					479		554		
PHF	0.89				0.77					0.9		0.97		
Total Lanes	1				1					1		2		
Terrain	Level				Level					Level		Level		
Grade %	0.0%				0.0%					0.0%		0.0%		
Grade Length (mi)	0.00				0.00					0.00		0.00		
Truck & Bus %	2.0%				2.0%					0.0%		1.0%		
RV %	0.0%				0.0%					0.0%		0.0%		
E_T	1.5				1.5					1.5		1.5		
E_R	1.2				1.2					1.2		1.2		
f_{wv}	0.990				0.990					1.000		0.995		
f_p	1.00				1.00					1.00		1.00		
Off Flow (pcph)	642				605					532		574		
Off Flow (pcphpl)	642				605					532		287		
Calculate Off Ramp Roadway Operations														
Off Ramp Type	Right				Right					Right		Right		
Off Ramp Speed	45				45					45		25		
Off Ramp Cap (pcph)	2,100				2,100					2,100		3,800		
Off Ramp v/c ratio	0.31				0.29					0.25		0.15		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps														
Up Type			Off							On		Off		
Up Distance			1,250							5,200		2,550		
Up Flow (pcph)			642							1,004		532		
Down Type			Off							On		No		
Down Distance			7,900							1,500				
Down Flow (pcph)			605							1,434				
Calculate Merge Influence Area Operations														
Effective v_p (pcph)			2,201					2,107						2,268
Up Ramp L_{EO}			124											
Down Ramp L_{EO}			2,239											
P_{FM} (Eqn 13-3)			0.620					0.588						0.602
P_{EM} (Eqn 13-4)			0.690									#VALUE!		
P_{FM} (Eqn 13-5)			0.569											
P_{EM}			1.000					1.000						1.000
v_{12} (pcph)			2,201					2,107						2,268
v_3 (pcph)														
v_{34} (pcph)														
v_{12a} (pcph)			2,201					2,107						2,268
v_{R12a} (pcph)			2,582					3,111						3,702
Merge Speed Index			0.30					0.37						0.40
Merge Area Speed			58.2					56.4						55.8
Outer Lanes Volume														
Outer Lanes Speed														
Segment Speed			58.2					56.4						55.8
Merge v/c ratio			0.56					0.68						0.80
Merge Density			16.0					26.9						28.2
Merge LOS			B					C						D



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate Diverge Influence Area Operations														
Effective v_p (pcph)	2,773				2,553					3,031				
Up Ramp L_{EQ}										10,011				
Down Ramp L_{EQ}										1,674				
P_{FD} (Eqn 13-9)	0.661				0.668					0.660				
P_{FD} (Eqn 13-10)										0.715				
P_{FD} (Eqn 13-11)			#VALUE!											
P_{FD}	1.000				1.000					0.715				
v_{12} (pcph)	2,773				2,553					2,320				
v_3 (pcph)										711				
v_{34} (pcph)														
v_{123} (pcph)	2,773				2,553					2,320				
Diverge Speed Index	0.36				0.35					0.35				
Diverge Area Speed	56.8				56.9					57.0				
Outer Lanes Volume										711				
Outer Lanes Speed										71.3				
Segment Speed	56.8				56.9					59.9				
Diverge v/c ratio	0.63				0.58					0.53				
Diverge Density	26.8				24.9					10.7				
Diverge LOS	C				C					B				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments														
On to Off Volume (vph)												93		
PHF												0.96		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												0.5%		
RV %												0.0%		
E_T												1.5		
E_R												1.2		
f_{HV}												0.998		
f_p												1.00		
On to Off Flow (pcph)												97		
Calculate On Ramp to Mainline Flow Rate for Weave Segments														
On to ML Volume (vph)												129		
PHF												0.9		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												0.0%		
RV %												0.0%		
E_T												1.5		
E_R												1.2		
f_{HV}												1.000		
f_p												1.00		
On to ML Flow (pcph)												144		
Calculate Mainline to Off Ramp Flow Rate for Weave Segments														
ML to Off Volume (vph)												461		
PHF												0.97		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												1.0%		
RV %												0.0%		
E_T												1.5		
E_R												1.2		
f_{HV}												0.995		
f_p												1.00		
ML to Off Flow (pcph)												478		



Location	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Key														
<> Express Lane (HOV)														
No Trucks														
Name	Cambridge Rd off-ramp	Cambridge Rd off to on-ramp	Cambridge Rd on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp	Bass Lake Rd to lane add	Lane add to Silva Valley Pkwy	Silva Valley Pkwy off-ramp	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments														
GP to GP Volume (vph)												1,978		
PHF												0.96		
Terrain												Level		
Grade %												0.0%		
Grade Length (mi)												0.00		
Truck & Bus %												2.0%		
RV %												0.0%		
E _T												1.5		
E _R												1.2		
f _{RV}												0.990		
f _p												1.00		
GP to GP Flow (pcph)												2,081		
Calculate Weave Segment Operations														
Weave Type												One-sided		
Weave Length												1,800		
Segment Lanes												2		
Weave Lanes												2		
Weave Flow (pcph)												622		
Non-Weave Flow												2,178		
Segment Flow												2,800		
Max Weave Length												4,763		
Length Check												OK		
Ideal Weave Capacity												2,123		
f _{RV}												0.992		
f _p												1.000		
Capacity Condition 1												4,211		
Capacity Condition 2												10,716		
Weave v/c ratio												0.66		
Interchange Density												2		
Lane Changes On to ML												1		
Lane Changes ML to Off												0		
Lane Changes On to Off												0		
Min Lane Change Rate												144		
Weave LC Rate												781		
Non-Weave LC Rate 1												1,039		
Non-Weave LC Rate 2												2,175		
Non-Weave LC Rate 3												138		
Segment LC Rate												1,820		
Weave Intensity Factor												0.228		
Weave Speed												55.7		
Non-Weave Speed												57.2		
Segment Speed												56.9		
Weave Density												24.6		
Weave LOS												C		
Summarize Segment Operations														
Segment v/c ratio	0.63	0.47	0.56	0.54	0.58	0.45	0.68	0.64	0.43	0.53	0.55	0.66	0.48	0.80
Segment Density	26.8	17.1	16.0	19.6	24.9	16.2	26.9	23.4	15.5	10.7	19.7	24.6	17.3	28.2
Segment LOS	C	B	B	C	C	B	C	C	B	B	C	C	B	D
Over Capacity														

Leisch Method for Weaving Analysis

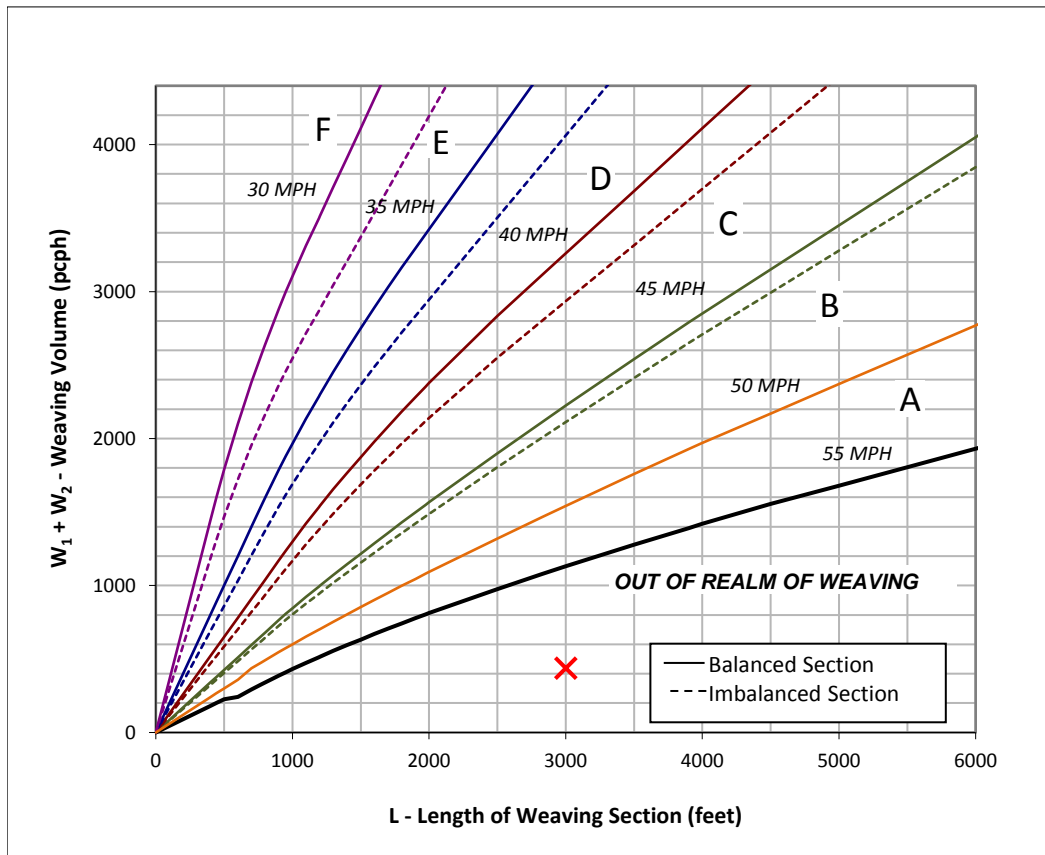
Data Input

Number of Entering Mainline Lanes	N_b	4
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	3,000

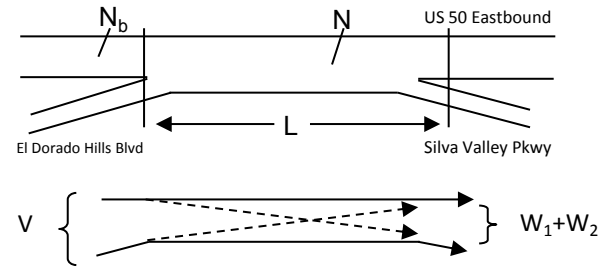
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project AM Peak Hour
Freeway	US 50 Eastbound
On-ramp	El Dorado Hills Blvd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	1,948	Volume (vph)*	402	Volume (vph)*	30
Truck Percentage	4%	Truck Percentage	2%	Truck Percentage	5%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	1,987	Volume (pcph)	406	Volume (pcph)	31



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

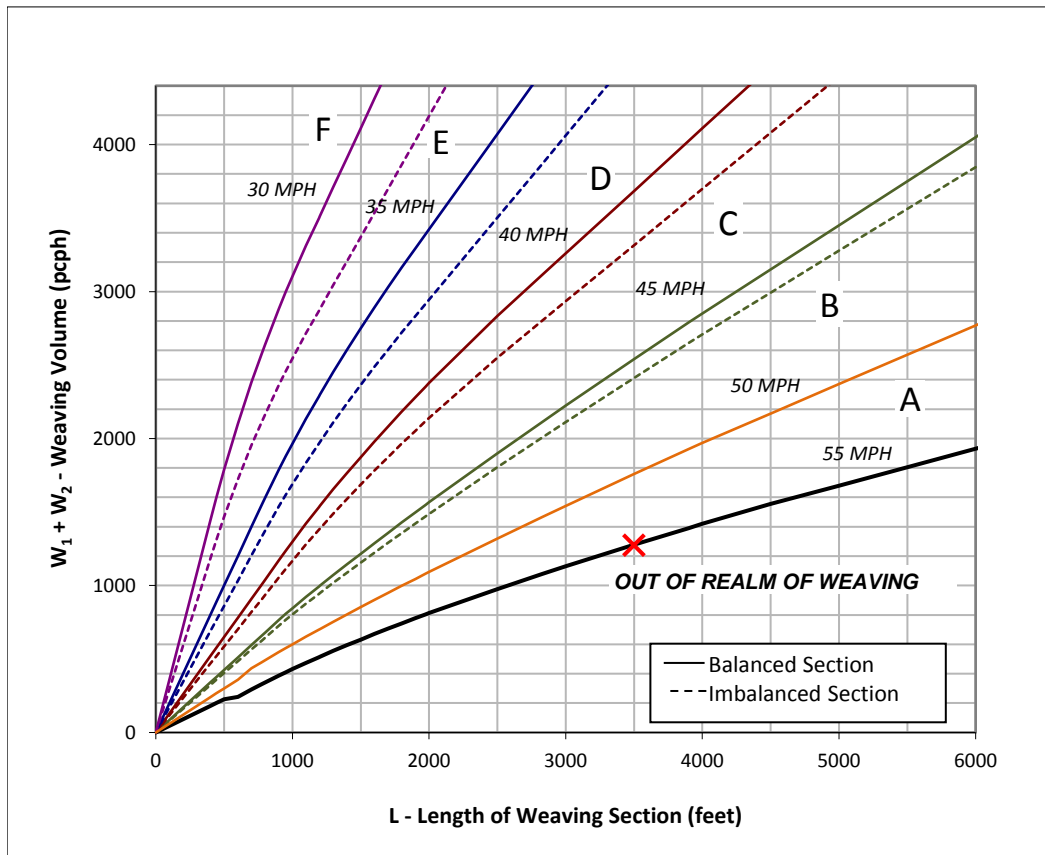
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,500

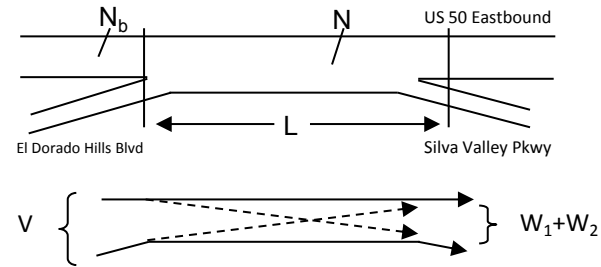
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project PM Peak Hour
Freeway	US 50 Eastbound
On-ramp	El Dorado Hills Blvd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,144	Volume (vph)*	862	Volume (vph)*	408
Truck Percentage	1%	Truck Percentage	1%	Truck Percentage	0%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,170	Volume (pcph)	866	Volume (pcph)	408



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
50 MPH and 55 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 55.0
- Weaving Intensity Factor (k) 1.00
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,292
- Level of Service (LOS) C

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and
Highway Design Manual, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

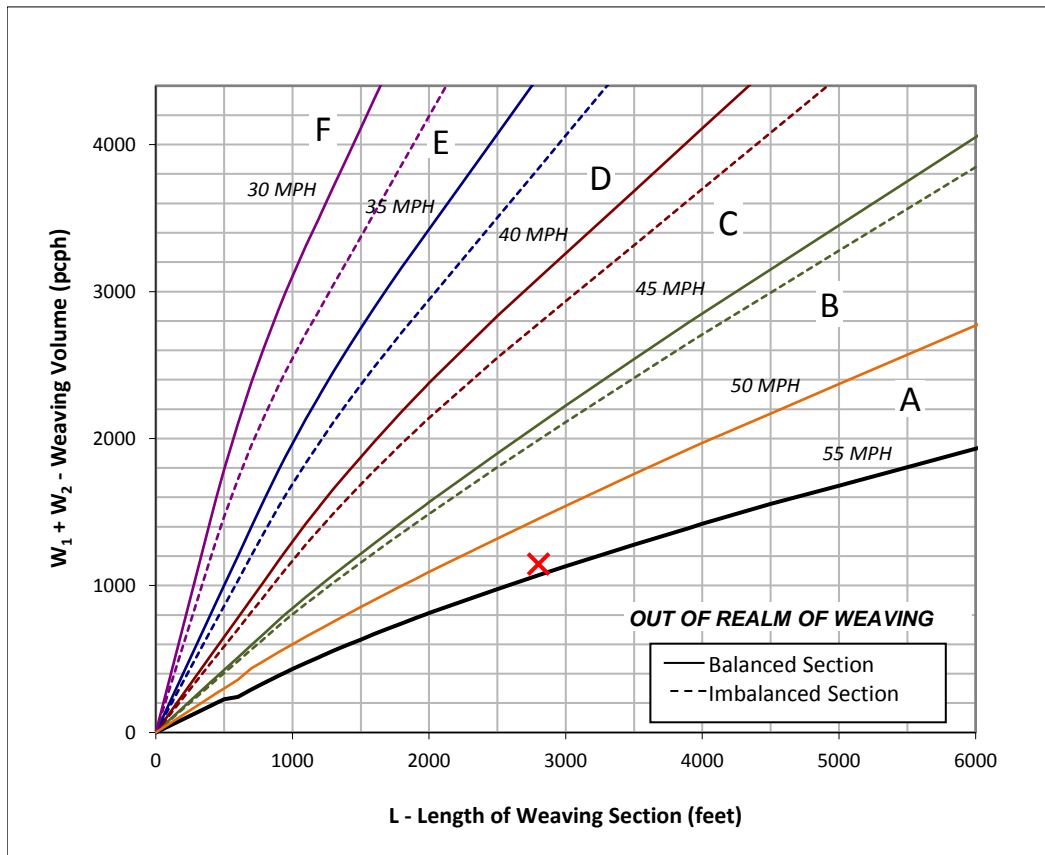
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	2,800

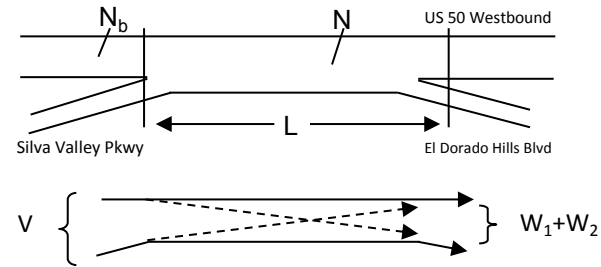
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project AM Peak Hour
Freeway	US 50 Westbound
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,820	Volume (vph)*	430	Volume (vph)*	708
Truck Percentage	2%	Truck Percentage	0%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,868	Volume (pcph)	430	Volume (pcph)	715



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
50 MPH and 55 MPH
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) 54.0
- Weaving Intensity Factor (k) 1.00
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,623
- Level of Service (LOS) E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and
Highway Design Manual, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

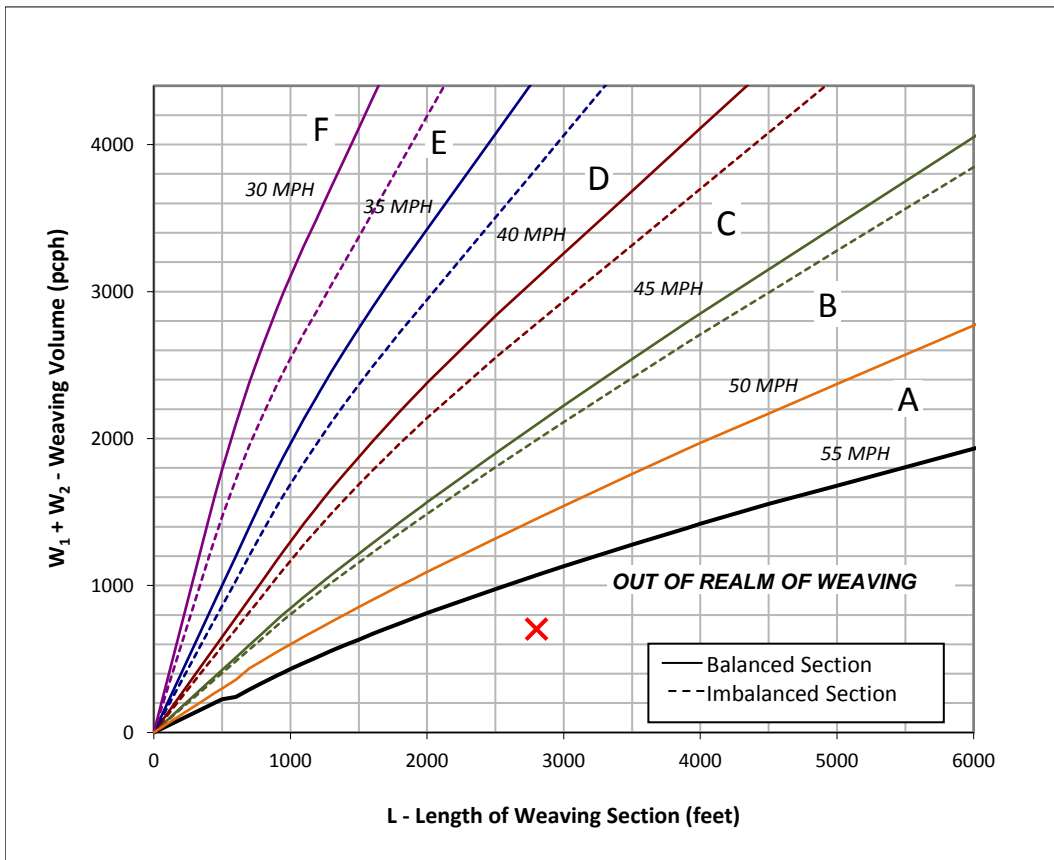
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	2
Length of Weaving Section (feet)	L	2,800

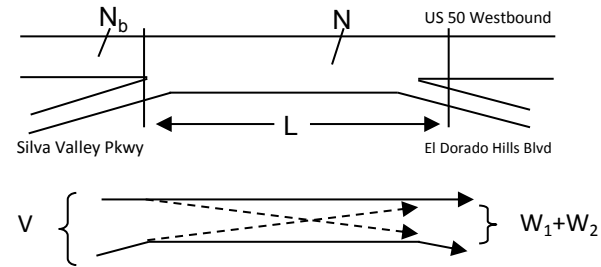
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project PM Peak Hour
Freeway	US 50 Westbound
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	2,874	Volume (vph)*	184	Volume (vph)*	516
Truck Percentage	2%	Truck Percentage	0%	Truck Percentage	1%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	2,903	Volume (pcph)	184	Volume (pcph)	519



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.























Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

APPENDIX A:
Cumulative Technical Calculations

DRAFT

HCM 2010 Signalized Intersection Summary
 1: Bass Lake Road & Serrano Parkway

Cumulative No Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	200	10	10	360	400	10	10	10	130	10	290
Future Volume (veh/h)	180	200	10	10	360	400	10	10	10	130	10	290
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1810	1810	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	228	253	6	11	419	208	11	11	0	151	11	11
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.79	0.79	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Percent Heavy Veh, %	5	5	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	290	869	759	20	603	511	133	139	0	238	115	115
Arrive On Green	0.17	0.48	0.48	0.01	0.32	0.32	0.07	0.07	0.00	0.13	0.13	0.13
Sat Flow, veh/h	1723	1810	1580	1774	1863	1578	1774	1863	0	1774	852	852
Grp Volume(v), veh/h	228	253	6	11	419	208	11	11	0	151	0	22
Grp Sat Flow(s),veh/h/ln	1723	1810	1580	1774	1863	1578	1774	1863	0	1774	0	1705
Q Serve(g_s), s	6.8	4.5	0.1	0.3	10.5	5.5	0.3	0.3	0.0	4.3	0.0	0.6
Cycle Q Clear(g_c), s	6.8	4.5	0.1	0.3	10.5	5.5	0.3	0.3	0.0	4.3	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.50
Lane Grp Cap(c), veh/h	290	869	759	20	603	511	133	139	0	238	0	229
V/C Ratio(X)	0.79	0.29	0.01	0.55	0.69	0.41	0.08	0.08	0.00	0.63	0.00	0.10
Avail Cap(c_a), veh/h	773	1995	1742	133	1358	1151	1094	1149	0	1094	0	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	8.4	7.2	26.3	15.8	14.1	23.0	23.0	0.0	21.9	0.0	20.3
Incr Delay (d2), s/veh	4.7	0.2	0.0	21.5	1.5	0.5	0.3	0.2	0.0	2.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	2.3	0.0	0.3	5.6	2.4	0.2	0.2	0.0	2.3	0.0	0.3
LnGrp Delay(d),s/veh	26.1	8.6	7.3	47.8	17.2	14.6	23.3	23.3	0.0	24.7	0.0	20.5
LnGrp LOS	C	A	A	D	B	B	C	C		C		C
Approach Vol, veh/h		487			638			22				173
Approach Delay, s/veh		16.8			16.9			23.3				24.1
Approach LOS		B			B			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	29.7		11.2	13.0	21.3		8.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	59.0		33.0	24.0	39.0		33.0				
Max Q Clear Time (g_c+I1), s	2.3	6.5		6.3	8.8	12.5		2.3				
Green Ext Time (p_c), s	0.0	4.8		0.5	0.5	4.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			17.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary
 2: Bass Lake Road & Driveway/Hollow Oak Drive

Cumulative No Project Conditions
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	0	0	0	220	0	70	0	430	90	40	940	0
Future Volume (veh/h)	0	0	0	220	0	70	0	430	90	40	940	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1810	1810	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	278	0	4	0	566	111	49	1146	0
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.76	0.76	0.76	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	2	2	2
Cap, veh/h	0	2	0	326	0	5	2	912	179	62	1318	0
Arrive On Green	0.00	0.00	0.00	0.19	0.00	0.19	0.00	0.62	0.62	0.03	0.71	0.00
Sat Flow, veh/h	0	1863	0	1740	0	25	1723	1470	288	1774	1863	0
Grp Volume(v), veh/h	0	0	0	282	0	0	0	0	677	49	1146	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1765	0	0	1723	0	1758	1774	1863	0
Q Serve(g_s), s	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	18.1	2.1	35.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	18.1	2.1	35.7	0.0
Prop In Lane	0.00		0.00	0.99		0.01	1.00		0.16	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	331	0	0	2	0	1090	62	1318	0
V/C Ratio(X)	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.62	0.79	0.87	0.00
Avail Cap(c_a), veh/h	0	415	0	393	0	0	90	0	1429	186	1612	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	30.0	0.0	0.0	0.0	0.0	8.9	36.5	8.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.6	19.9	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	8.8	1.4	19.5	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	44.2	0.0	0.0	0.0	0.0	9.5	56.4	13.1	0.0
LnGrp LOS				D					A	E	B	
Approach Vol, veh/h		0			282			677			1195	
Approach Delay, s/veh		0.0			44.2			9.5			14.9	
Approach LOS					D			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	51.3		0.0	0.0	58.0		18.3				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	62.0	62.0		17.0	4.0	66.0		17.0				
Max Q Clear Time (g_c+14), s	20.1	20.1		0.0	0.0	37.7		13.8				
Green Ext Time (p_c), s	0.0	20.0		0.0	0.0	16.3		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				17.0								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary
4: Bass Lake Road & Country Club Drive

Cumulative No Project Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑	↗	↖	↗	
Traffic Volume (veh/h)	30	50	60	130	110	100	140	410	180	170	910	100
Future Volume (veh/h)	30	50	60	130	110	100	140	410	180	170	910	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1827	1827	1863	1863	1900
Adj Flow Rate, veh/h	32	53	6	137	116	60	147	432	62	179	958	105
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	2	2
Cap, veh/h	49	149	17	200	203	105	187	710	602	225	1320	145
Arrive On Green	0.03	0.09	0.09	0.11	0.18	0.18	0.11	0.39	0.39	0.13	0.41	0.41
Sat Flow, veh/h	1774	1644	186	1774	1157	598	1774	1827	1549	1774	3217	352
Grp Volume(v), veh/h	32	0	59	137	0	176	147	432	62	179	527	536
Grp Sat Flow(s),veh/h/ln	1774	0	1830	1774	0	1755	1774	1827	1549	1774	1770	1800
Q Serve(g_s), s	1.0	0.0	1.7	4.2	0.0	5.2	4.6	10.8	1.5	5.6	14.2	14.2
Cycle Q Clear(g_c), s	1.0	0.0	1.7	4.2	0.0	5.2	4.6	10.8	1.5	5.6	14.2	14.2
Prop In Lane	1.00		0.10	1.00		0.34	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	49	0	165	200	0	308	187	710	602	225	726	739
V/C Ratio(X)	0.65	0.00	0.36	0.68	0.00	0.57	0.79	0.61	0.10	0.79	0.73	0.73
Avail Cap(c_a), veh/h	156	0	707	498	0	1017	249	834	707	312	870	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	24.3	24.3	0.0	21.5	24.8	13.9	11.1	24.1	14.1	14.1
Incr Delay (d2), s/veh	13.3	0.0	1.3	4.1	0.0	1.7	11.3	1.0	0.1	9.3	2.4	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.9	2.3	0.0	2.7	2.8	5.6	0.6	3.3	7.4	7.5
LnGrp Delay(d),s/veh	40.7	0.0	25.6	28.4	0.0	23.2	36.2	14.9	11.2	33.4	16.5	16.5
LnGrp LOS	D		C	C		C	D	B	B	C	B	B
Approach Vol, veh/h		91			313			641			1242	
Approach Delay, s/veh		30.9			25.5			19.4			19.0	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.2	26.1	10.4	9.1	10.0	27.4	5.6	14.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	1.0	26.0	16.0	22.0	8.0	28.0	5.0	33.0				
Max Q Clear Time (g_c+1), s	1.0	12.8	6.2	3.7	6.6	16.2	3.0	7.2				
Green Ext Time (p_c), s	0.1	7.7	0.2	1.2	0.0	7.1	0.0	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay				20.5								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
5: Bass Lake Road & US 50 WB Ramps

Cumulative No Project Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↕		↕			↕	↕
Traffic Volume (veh/h)	0	0	0	10	0	260	510	460	0	0	360	760
Future Volume (veh/h)	0	0	0	10	0	260	510	460	0	0	360	760
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1827	1827	1900	1845	0	0	1863	1863
Adj Flow Rate, veh/h				11	0	0	537	484	0	0	379	0
Adj No. of Lanes				0	1	1	0	2	0	0	1	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				4	4	4	3	3	0	0	2	2
Cap, veh/h				18	0	16	0	3235	0	0	1720	1462
Arrive On Green				0.01	0.00	0.00	0.00	1.00	0.00	0.00	0.92	0.00
Sat Flow, veh/h				1740	0	1553	0	3597	0	0	1863	1583
Grp Volume(v), veh/h				11	0	0	0	484	0	0	379	0
Grp Sat Flow(s),veh/h/ln				1740	0	1553	0	1752	0	0	1863	1583
Q Serve(g_s), s				0.8	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
Cycle Q Clear(g_c), s				0.8	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				18	0	16	0	3235	0	0	1720	1462
V/C Ratio(X)				0.62	0.00	0.00	0.00	0.15	0.00	0.00	0.22	0.00
Avail Cap(c_a), veh/h				406	0	362	0	3235	0	0	1720	1462
HCM Platoon Ratio				1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.67	0.00	0.00	0.61	0.00
Uniform Delay (d), s/veh				59.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Incr Delay (d2), s/veh				30.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
LnGrp Delay(d),s/veh				89.2	0.0	0.0	0.0	0.1	0.0	0.0	0.6	0.0
LnGrp LOS				F				A			A	
Approach Vol, veh/h					11			484			379	
Approach Delay, s/veh					89.2			0.1			0.6	
Approach LOS					F			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		114.8			0.0	114.8		5.2				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		84.0			4.0	76.0		28.0				
Max Q Clear Time (g_c+I1), s		2.0			0.0	4.4		2.8				
Green Ext Time (p_c), s		6.2			0.0	6.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				1.4								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary
 6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps

Cumulative No Project Conditions
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	10	120	0	0	0	0	570	10	330	40	0
Future Volume (veh/h)	400	10	120	0	0	0	0	570	10	330	40	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900				0	1827	1900	1900	1863	0
Adj Flow Rate, veh/h	495	0	0				0	600	10	347	42	0
Adj No. of Lanes	2	1	0				0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	2	2	0
Cap, veh/h	675	354	0				0	478	8	0	1253	0
Arrive On Green	0.19	0.00	0.00				0.00	0.27	0.27	0.34	0.67	0.00
Sat Flow, veh/h	3480	1827	0				0	1792	30	0	1863	0
Grp Volume(v), veh/h	495	0	0				0	0	610	0	42	0
Grp Sat Flow(s),veh/h/ln	1740	1827	0				0	0	1822	0	1863	0
Q Serve(g_s), s	8.0	0.0	0.0				0.0	0.0	16.0	0.0	0.5	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0				0.0	0.0	16.0	0.0	0.5	0.0
Prop In Lane	1.00		0.00				0.00		0.02	0.00		0.00
Lane Grp Cap(c), veh/h	675	354	0				0	0	486	0	1253	0
V/C Ratio(X)	0.73	0.00	0.00				0.00	0.00	1.26	0.00	0.03	0.00
Avail Cap(c_a), veh/h	1624	853	0				0	0	486	0	1253	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.00	1.00	0.00	0.97	0.00
Uniform Delay (d), s/veh	22.7	0.0	0.0				0.0	0.0	22.0	0.0	3.3	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0				0.0	0.0	131.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0				0.0	0.0	25.6	0.0	0.3	0.0
LnGrp Delay(d),s/veh	24.3	0.0	0.0				0.0	0.0	153.1	0.0	3.3	0.0
LnGrp LOS	C						F			A		
Approach Vol, veh/h	495						610			42		
Approach Delay, s/veh	24.3						153.1			3.3		
Approach LOS	C						F			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	24.4	20.0	15.6		44.4							
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0							
Max Green Setting (Gmax), s	16.0	16.0	28.0		24.0							
Max Q Clear Time (g_c+10), s	18.0	18.0	10.0		2.5							
Green Ext Time (p_c), s	0.0	0.0	1.6		0.1							
Intersection Summary												
HCM 2010 Ctrl Delay			92.0									
HCM 2010 LOS			F									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑↑	↑↑	
Traffic Vol, veh/h	30	10	10	540	150	10
Future Vol, veh/h	30	10	10	540	150	10
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	12	12	8	8
Mvmt Flow	32	11	11	568	158	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	472	88	170	0	-	0
Stage 1	165	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.34	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.32	-	-	-
Pot Cap-1 Maneuver	521	953	1335	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	513	950	1333	-	-	-
Mov Cap-2 Maneuver	513	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	709	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1333	-	580	-	-
HCM Lane V/C Ratio	0.008	-	0.073	-	-
HCM Control Delay (s)	7.7	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Traffic Vol, veh/h	140	10	10	530	10	10
Future Vol, veh/h	140	10	10	530	10	10
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	147	11	11	558	11	11

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	160	457
Stage 1	-	-	155
Stage 2	-	-	302
Critical Hdwy	-	4.14	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	2.22	3.52
Pot Cap-1 Maneuver	-	1417	532
Stage 1	-	-	857
Stage 2	-	-	724
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1415	524
Mov Cap-2 Maneuver	-	-	524
Stage 1	-	-	856
Stage 2	-	-	715

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	677	-	-	1415	-
HCM Lane V/C Ratio	0.031	-	-	0.007	-
HCM Control Delay (s)	10.5	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	153.7
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	80	10	30	0	80	20	10	0	20	300	30
Future Vol, veh/h	0	80	10	30	0	80	20	10	0	20	300	30
Peak Hour Factor	0.92	0.56	0.56	0.56	0.92	0.58	0.58	0.58	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	143	18	54	0	138	34	17	0	26	385	38
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	19.6	18.9	40.4
HCM LOS	C	C	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	67%	73%	1%
Vol Thru, %	86%	8%	18%	77%
Vol Right, %	9%	25%	9%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	350	120	110	710
LT Vol	20	80	80	10
Through Vol	300	10	20	550
RT Vol	30	30	10	150
Lane Flow Rate	449	214	190	855
Geometry Grp	1	1	1	1
Degree of Util (X)	0.847	0.464	0.422	1.555
Departure Headway (Hd)	7.683	9.042	9.287	6.545
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	476	401	391	556
Service Time	5.683	7.042	7.287	4.601
HCM Lane V/C Ratio	0.943	0.534	0.486	1.538
HCM Control Delay	40.4	19.6	18.9	276.6
HCM Lane LOS	E	C	C	F
HCM 95th-tile Q	8.5	2.4	2	44.9

Intersection


















Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	10	550	150
Future Vol, veh/h	0	10	550	150
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	12	663	181
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	276.6
HCM LOS	F























HCM Unsignalized Intersection Capacity Analysis
 10: Cambridge Road & Knollwood Drive

Cumulative No Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	60	420	200	40	40	260	290	230	80	600	10
Future Volume (Veh/h)	10	60	420	200	40	40	260	290	230	80	600	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.50	0.50	0.50	0.81	0.81	0.81	0.83	0.83	0.83
Hourly flow rate (vph)	13	75	525	400	80	80	321	358	284	96	723	12
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	2045	2209	733	2630	2073	504	737			644		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2154	2351	733	2856	2188	304	737			472		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	0	0	0	87	63			89		
cM capacity (veh/h)	0	17	419	0	21	611	867			906		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	613	560	321	642	831							
Volume Left	13	400	321	0	96							
Volume Right	525	80	0	284	12							
cSH	0	0	867	1700	906							
Volume to Capacity	Err	Err	0.37	0.38	0.11							
Queue Length 95th (ft)	Err	Err	43	0	9							
Control Delay (s)	Err	Err	11.6	0.0	2.7							
Lane LOS	F	F	B		A							
Approach Delay (s)	Err	Err	3.9		2.7							
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			124.8%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary
 11: Cambridge Road & Merrychase Drive/US 50 WB Ramps

Cumulative No Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	190	220	210	270	320	120	420	60	480	620	100
Future Volume (veh/h)	50	190	220	210	270	320	120	420	60	480	620	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	69	264	0	318	409	174	169	592	0	500	646	94
Adj No. of Lanes	0	1	1	0	1	2	1	2	1	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.66	0.66	0.66	0.71	0.71	0.71	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	214	231	264	339	1528	183	626	280	396	921	134
Arrive On Green	0.15	0.15	0.00	0.33	0.33	0.33	0.10	0.18	0.00	0.22	0.30	0.29
Sat Flow, veh/h	382	1462	1583	797	1026	2778	1774	3539	1583	1774	3101	451
Grp Volume(v), veh/h	333	0	0	727	0	174	169	592	0	500	368	372
Grp Sat Flow(s),veh/h/ln	1844	0	1583	1823	0	1389	1774	1770	1583	1774	1770	1781
Q Serve(g_s), s	19.0	0.0	0.0	43.0	0.0	3.9	12.3	21.5	0.0	29.0	24.0	24.1
Cycle Q Clear(g_c), s	19.0	0.0	0.0	43.0	0.0	3.9	12.3	21.5	0.0	29.0	24.0	24.1
Prop In Lane	0.21		1.00	0.44		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	269	0	231	603	0	1528	183	626	280	396	525	529
V/C Ratio(X)	1.24	0.00	0.00	1.21	0.00	0.11	0.92	0.95	0.00	1.26	0.70	0.70
Avail Cap(c_a), veh/h	269	0	231	603	0	1528	183	626	280	396	525	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	0.0	0.0	43.5	0.0	14.1	57.8	52.9	0.0	50.5	40.6	40.7
Incr Delay (d2), s/veh	133.9	0.0	0.0	107.6	0.0	0.0	44.7	23.1	0.0	137.4	3.5	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.7	0.0	0.0	39.6	0.0	1.5	8.3	12.5	0.0	29.3	12.3	12.4
LnGrp Delay(d),s/veh	189.4	0.0	0.0	151.1	0.0	14.1	102.5	76.0	0.0	187.9	44.1	44.2
LnGrp LOS	F			F		B	F	E		F	D	D
Approach Vol, veh/h		333			901			761			1240	
Approach Delay, s/veh		189.4			124.7			81.9			102.1	
Approach LOS		F			F			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	33.0	27.0		23.0	17.4	42.6		47.0				
Change Period (Y+Rc), s	3.5	4.4		4.1	3.5	4.4		4.1				
Max Green Setting (Gmax), s	29.5	22.6		18.9	13.9	38.2		42.9				
Max Q Clear Time (g_c+I1), s	31.0	23.5		21.0	14.3	26.1		45.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	4.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			112.6									
HCM 2010 LOS			F									

HCM 2010 Signalized Intersection Summary
 12: Cambridge Road & US 50 EB Ramps

Cumulative No Project Conditions
 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	↶↶	↷	↶	↶	↶↶	↷		
Traffic Volume (veh/h)	350	30	190	250	370	680		
Future Volume (veh/h)	350	30	190	250	370	680		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	385	4	238	312	402	0		
Adj No. of Lanes	2	1	1	1	2	1		
Peak Hour Factor	0.91	0.91	0.80	0.80	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	627	288	319	1081	997	446		
Arrive On Green	0.18	0.18	0.18	0.58	0.28	0.00		
Sat Flow, veh/h	3442	1583	1774	1863	3632	1583		
Grp Volume(v), veh/h	385	4	238	312	402	0		
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1863	1770	1583		
Q Serve(g_s), s	3.5	0.1	4.3	2.8	3.1	0.0		
Cycle Q Clear(g_c), s	3.5	0.1	4.3	2.8	3.1	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	627	288	319	1081	997	446		
V/C Ratio(X)	0.61	0.01	0.75	0.29	0.40	0.00		
Avail Cap(c_a), veh/h	1329	611	896	2435	2418	1082		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	12.7	11.3	13.1	3.6	9.8	0.0		
Incr Delay (d2), s/veh	1.0	0.0	3.5	0.1	0.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.7	0.1	2.4	1.4	1.5	0.0		
LnGrp Delay(d),s/veh	13.7	11.3	16.6	3.7	10.1	0.0		
LnGrp LOS	B	B	B	A	B			
Approach Vol, veh/h	389			550	402			
Approach Delay, s/veh	13.6			9.3	10.1			
Approach LOS	B			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		23.5		10.1	10.0	13.5		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		44.0		13.0	17.0	23.0		
Max Q Clear Time (g_c+I1), s		4.8		5.5	6.3	5.1		
Green Ext Time (p_c), s		5.1		0.8	0.5	4.3		
Intersection Summary								
HCM 2010 Ctrl Delay			10.8					
HCM 2010 LOS			B					

HCM 2010 TWSC
 13: Flying C Road & Crazy Horse Road & Cambridge Road

Cumulative No Project Conditions
 AM Peak Hour

Intersection												
Int Delay, s/veh	12.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	↕
Traffic Vol, veh/h	90	10	10	70	10	110	10	170	10	120	190	50
Future Vol, veh/h	90	10	10	70	10	110	10	170	10	120	190	50
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	71	71	71	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	134	15	15	99	14	155	11	179	11	126	200	53
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	747	668	204	677	662	188	202	0	0	191	0	0
Stage 1	455	455	-	207	207	-	-	-	-	-	-	-
Stage 2	292	213	-	470	455	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	329	379	837	367	382	854	1370	-	-	1383	-	-
Stage 1	585	569	-	795	731	-	-	-	-	-	-	-
Stage 2	716	726	-	574	569	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	240	340	834	321	343	851	1368	-	-	1381	-	-
Mov Cap-2 Maneuver	240	340	-	321	343	-	-	-	-	-	-	-
Stage 1	579	516	-	787	723	-	-	-	-	-	-	-
Stage 2	568	718	-	497	516	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	38.7			19.9			0.4			2.6		
HCM LOS	E			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1368	-	-	264	505	1381	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.622	0.53	0.091	-	-				
HCM Control Delay (s)	7.7	0	-	38.7	19.9	7.9	-	-				
HCM Lane LOS	A	A	-	E	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	3.8	3.1	0.3	-	-				

Intersection

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	30	170	10	30	250
Future Vol, veh/h	10	30	170	10	30	250
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	32	179	11	32	263

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	514	188	0	0	191	0
Stage 1	186	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	521	854	-	-	1383	-
Stage 1	846	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	505	851	-	-	1381	-
Mov Cap-2 Maneuver	505	-	-	-	-	-
Stage 1	845	-	-	-	-	-
Stage 2	709	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.3		0		0.8
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 727	1381	-
HCM Lane V/C Ratio	-	- 0.058	0.023	-
HCM Control Delay (s)	-	- 10.3	7.7	0
HCM Lane LOS	-	- B	A	A
HCM 95th %tile Q(veh)	-	- 0.2	0.1	-

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative No Project Conditions
AM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1,020	1,035	101.5%	37.6	9.9	D
	Through	670	691	103.1%	5.1	0.7	A
	Right Turn	50	51	102.0%	3.3	1.6	A
	Subtotal	1,740	1,777	102.1%	23.8	5.6	C
SB	Left Turn	50	50	99.4%	95.5	18.5	F
	Through	1,100	1,127	102.4%	29.9	6.3	C
	Right Turn	520	532	102.2%	10.0	2.9	B
	Subtotal	1,670	1,708	102.3%	25.8	4.5	C
EB	Left Turn	140	133	95.0%	53.3	4.4	D
	Through	10	10	95.0%	46.7	23.3	D
	Right Turn	330	324	98.2%	3.2	0.4	A
	Subtotal	480	467	97.2%	18.5	2.5	B
WB	Left Turn	90	91	101.2%	67.4	15.8	E
	Through	20	18	88.5%	64.6	17.2	E
	Right Turn	40	42	105.0%	7.6	4.6	A
	Subtotal	150	151	100.5%	53.4	12.2	D
Total		4,040	4,102	101.5%	25.2	3.0	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative No Project Conditions
AM Peak Hour

Intersection 16




















Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	1,550	1,586	102.3%	7.9	1.3	A
	Right Turn	200	207	103.6%	6.0	0.5	A
	Subtotal	1,750	1,793	102.4%	7.7	1.2	A
SB	Left Turn	290	294	101.5%	31.8	3.7	C
	Through	1,230	1,240	100.8%	27.4	17.2	C
	Right Turn						
	Subtotal	1,520	1,534	100.9%	28.3	13.9	C
EB	Left Turn						
	Through						
	Right Turn	1,190	1,177	98.9%	24.8	6.4	C
	Subtotal	1,190	1,177	98.9%	24.8	6.4	C
WB	Left Turn						
	Through						
	Right Turn	190	196	103.3%	0.6	0.2	A
	Subtotal	190	196	103.3%	0.6	0.2	A
Total		4,650	4,700	101.1%	18.4	5.9	B

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US-50 WB Ramps






















Cumulative No Project Conditions
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	730	0	550	0	960	80	0	400	220
Future Volume (veh/h)	0	0	0	730	0	550	0	960	80	0	400	220
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h				768	0	559	0	1011	0	0	421	86
Adj No. of Lanes				2	0	1	0	2	1	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	2	2	0	2	2	0	2	2
Cap, veh/h				1656	0	739	0	1416	633	0	1416	633
Arrive On Green				0.47	0.00	0.47	0.00	0.13	0.00	0.00	0.40	0.40
Sat Flow, veh/h				3548	0	1583	0	3632	1583	0	3632	1583
Grp Volume(v), veh/h				768	0	559	0	1011	0	0	421	86
Grp Sat Flow(s),veh/h/ln				1774	0	1583	0	1770	1583	0	1770	1583
Q Serve(g_s), s				8.8	0.0	17.5	0.0	16.4	0.0	0.0	4.9	2.1
Cycle Q Clear(g_c), s				8.8	0.0	17.5	0.0	16.4	0.0	0.0	4.9	2.1
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1656	0	739	0	1416	633	0	1416	633
V/C Ratio(X)				0.46	0.00	0.76	0.00	0.71	0.00	0.00	0.30	0.14
Avail Cap(c_a), veh/h				1656	0	739	0	1416	633	0	1416	633
HCM Platoon Ratio				1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	0.93	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				10.9	0.0	13.2	0.0	22.8	0.0	0.0	12.3	11.4
Incr Delay (d2), s/veh				0.9	0.0	7.1	0.0	2.9	0.0	0.0	0.5	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.5	0.0	8.9	0.0	8.6	0.0	0.0	2.4	1.0
LnGrp Delay(d),s/veh				11.8	0.0	20.3	0.0	25.6	0.0	0.0	12.8	11.9
LnGrp LOS				B		C		C			B	B
Approach Vol, veh/h					1327			1011			507	
Approach Delay, s/veh					15.4			25.6			12.6	
Approach LOS					B			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		28.0				28.0		32.0				
Change Period (Y+Rc), s		4.0				4.0		4.0				
Max Green Setting (Gmax), s		24.0				24.0		28.0				
Max Q Clear Time (g_c+I1), s		18.4				6.9		19.5				
Green Ext Time (p_c), s		3.9				8.8		3.5				
Intersection Summary												
HCM 2010 Ctrl Delay				18.5								
HCM 2010 LOS				B								
Notes												

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US-50 EB Ramps

Cumulative No Project Conditions
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	310	0	80	0	0	0	0	730	630	0	950	180
Future Volume (veh/h)	310	0	80	0	0	0	0	730	630	0	950	180
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h	326	0	11				0	768	0	0	1000	0
Adj No. of Lanes	2	0	1				0	2	1	0	2	1
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	461	0	212				0	2593	1160	0	2593	1160
Arrive On Green	0.13	0.00	0.13				0.00	0.73	0.00	0.00	0.24	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	0	3632	1583
Grp Volume(v), veh/h	326	0	11				0	768	0	0	1000	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	0	1770	1583
Q Serve(g_s), s	5.4	0.0	0.4				0.0	4.4	0.0	0.0	14.2	0.0
Cycle Q Clear(g_c), s	5.4	0.0	0.4				0.0	4.4	0.0	0.0	14.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	461	0	212				0	2593	1160	0	2593	1160
V/C Ratio(X)	0.71	0.00	0.05				0.00	0.30	0.00	0.00	0.39	0.00
Avail Cap(c_a), veh/h	803	0	369				0	2593	1160	0	2593	1160
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.93	0.00
Uniform Delay (d), s/veh	24.9	0.0	22.7				0.0	2.7	0.0	0.0	11.5	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.1				0.0	0.3	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.2				0.0	2.2	0.0	0.0	7.1	0.0
LnGrp Delay(d),s/veh	26.9	0.0	22.8				0.0	3.0	0.0	0.0	11.9	0.0
LnGrp LOS	C		C					A			B	
Approach Vol, veh/h		337						768			1000	
Approach Delay, s/veh		26.7						3.0			11.9	
Approach LOS		C						A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		48.0		12.0		48.0						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		38.0		14.0		38.0						
Max Q Clear Time (g_c+I1), s		6.4		7.4		16.2						
Green Ext Time (p_c), s		14.8		0.6		12.2						
Intersection Summary												
HCM 2010 Ctrl Delay			11.0									
HCM 2010 LOS			B									

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative No Project Conditions
AM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	70	74	105.7%	68.9	11.5	E
	Through	710	721	101.6%	13.8	1.9	B
	Right Turn	70	70	99.7%	2.3	0.2	A
	Subtotal	850	865	101.8%	17.1	2.8	B
SB	Left Turn	40	42	104.5%	98.6	21.5	F
	Through	1,510	1,548	102.5%	25.3	3.1	C
	Right Turn	620	624	100.6%	31.2	9.3	C
	Subtotal	2,170	2,213	102.0%	28.3	4.3	C
EB	Left Turn	160	164	102.4%	66.4	11.1	E
	Through	100	99	99.2%	64.6	8.1	E
	Right Turn	40	43	107.0%	7.9	3.1	A
	Subtotal	300	306	101.9%	56.0	6.4	E
WB	Left Turn	120	120	100.3%	56.1	6.3	E
	Through	230	221	96.1%	57.6	6.3	E
	Right Turn	60	61	101.2%	5.5	1.4	A
	Subtotal	410	402	98.0%	49.5	3.6	D
Total		3,730	3,786	101.5%	30.3	3.6	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative No Project Conditions
AM Peak Hour

Intersection 21 Latrobe Rd/Town Center Blvd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	70	68	97.6%	43.2	17.4	D
	Through	1,460	1,497	102.6%	16.2	2.3	B
	Right Turn	50	50	99.2%	2.2	0.6	A
	Subtotal	1,580	1,615	102.2%	16.7	2.5	B
SB	Left Turn	470	463	98.4%	54.7	6.1	D
	Through	1,890	1,875	99.2%	42.2	10.8	D
	Right Turn	60	64	106.0%	9.8	7.2	A
	Subtotal	2,420	2,401	99.2%	43.6	9.4	D
EB	Left Turn	10	8	84.0%	42.6	37.5	D
	Through	10	11	109.0%	55.1	26.9	E
	Right Turn	10	12	122.0%	33.5	19.9	C
	Subtotal	30	32	105.0%	46.0	15.5	D
WB	Left Turn	120	125	103.9%	80.5	23.8	F
	Through	30	31	103.3%	79.7	21.0	E
	Right Turn	280	286	102.3%	35.4	16.6	D
	Subtotal	430	442	102.8%	50.9	18.1	D
Total		4,460	4,490	100.7%	34.6	5.9	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement























Marble Valley EIR
Cumulative No Project Conditions
AM Peak Hour

Intersection 22 Latrobe Rd/White Rock Rd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	160	135	84.3%	275.3	29.6	F
	Through	1,140	1,170	102.6%	50.2	13.4	D
	Right Turn	210	212	100.9%	31.6	14.2	C
	Subtotal	1,510	1,517	100.4%	67.5	14.8	E
SB	Left Turn	120	125	104.4%	54.4	7.8	D
	Through	1,080	1,100	101.8%	22.6	2.1	C
	Right Turn	820	771	94.0%	100.7	11.7	F
	Subtotal	2,020	1,996	98.8%	54.7	4.8	D
EB	Left Turn	260	262	100.7%	75.2	11.1	E
	Through	160	163	102.0%	42.0	3.8	D
	Right Turn	110	114	103.7%	24.7	3.9	C
	Subtotal	530	539	101.7%	53.6	5.6	D
WB	Left Turn	330	318	96.3%	156.9	66.8	F
	Through	550	561	101.9%	59.4	11.3	E
	Right Turn	180	185	102.9%	5.0	1.4	A
	Subtotal	1,060	1,064	100.3%	79.2	24.0	E
Total		5,120	5,115	99.9%	63.5	6.4	E

HCM 2010 Signalized Intersection Summary
 1: Bass Lake Road & Serrano Parkway

Cumulative No Project
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	120	10	10	280	200	10	10	10	580	10	180
Future Volume (veh/h)	210	120	10	10	280	200	10	10	10	580	10	180
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1810	1810	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	219	125	3	11	298	49	11	11	0	630	11	71
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.92	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	628	548	19	386	326	89	93	0	695	85	547
Arrive On Green	0.15	0.35	0.35	0.01	0.21	0.21	0.05	0.05	0.00	0.39	0.39	0.39
Sat Flow, veh/h	1723	1810	1579	1774	1863	1576	1774	1863	0	1774	216	1396
Grp Volume(v), veh/h	219	125	3	11	298	49	11	11	0	630	0	82
Grp Sat Flow(s),veh/h/ln	1723	1810	1579	1774	1863	1576	1774	1863	0	1774	0	1612
Q Serve(g_s), s	9.9	3.9	0.1	0.5	12.1	2.0	0.5	0.5	0.0	26.8	0.0	2.6
Cycle Q Clear(g_c), s	9.9	3.9	0.1	0.5	12.1	2.0	0.5	0.5	0.0	26.8	0.0	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.87
Lane Grp Cap(c), veh/h	260	628	548	19	386	326	89	93	0	695	0	632
V/C Ratio(X)	0.84	0.20	0.01	0.57	0.77	0.15	0.12	0.12	0.00	0.91	0.00	0.13
Avail Cap(c_a), veh/h	388	951	830	89	653	552	732	769	0	1110	0	1008
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	18.3	17.1	39.3	29.9	25.9	36.3	36.3	0.0	22.9	0.0	15.6
Incr Delay (d2), s/veh	10.2	0.2	0.0	24.0	3.3	0.2	0.6	0.6	0.0	6.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	1.9	0.0	0.4	6.6	0.9	0.2	0.2	0.0	14.3	0.0	1.2
LnGrp Delay(d),s/veh	43.1	18.4	17.1	63.3	33.3	26.2	36.9	36.8	0.0	29.9	0.0	15.7
LnGrp LOS	D	B	B	E	C	C	D	D		C		B
Approach Vol, veh/h		347			358			22			712	
Approach Delay, s/veh		34.0			33.2			36.9			28.2	
Approach LOS		C			C			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	31.8		35.3	16.1	20.5		8.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	42.0		50.0	18.0	28.0		33.0				
Max Q Clear Time (g_c+I1), s	2.5	5.9		28.8	11.9	14.1		2.5				
Green Ext Time (p_c), s	0.0	2.4		2.5	0.3	1.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			31.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
 2: Bass Lake Road & Driveway/Hollow Oak Drive

Cumulative No Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	0	0	0	110	0	50	0	660	190	60	590	0
Future Volume (veh/h)	0	0	0	110	0	50	0	660	190	60	590	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.87	1.00		0.97	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1810	1810	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	147	0	67	0	688	198	62	608	0
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.96	0.96	0.96	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	2	2	2
Cap, veh/h	0	3	0	186	0	85	3	804	231	78	1315	0
Arrive On Green	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.60	0.60	0.04	0.71	0.00
Sat Flow, veh/h	0	1863	0	1117	0	509	1723	1343	386	1774	1863	0
Grp Volume(v), veh/h	0	0	0	214	0	0	0	0	886	62	608	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1626	0	0	1723	0	1729	1774	1863	0
Q Serve(g_s), s	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	26.6	2.2	9.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	26.6	2.2	9.0	0.0
Prop In Lane	0.00		0.00	0.69		0.31	1.00		0.22	1.00		0.00
Lane Grp Cap(c), veh/h	0	3	0	271	0	0	3	0	1035	78	1315	0
V/C Ratio(X)	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.86	0.80	0.46	0.00
Avail Cap(c_a), veh/h	0	503	0	439	0	0	109	0	1262	113	1360	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	25.2	0.0	0.0	0.0	0.0	10.4	29.8	4.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	5.1	21.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	13.8	1.5	4.7	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	30.3	0.0	0.0	0.0	0.0	15.5	51.3	4.3	0.0
LnGrp LOS				C					B	D	A	
Approach Vol, veh/h		0			214			886			670	
Approach Delay, s/veh		0.0			30.3			15.5			8.6	
Approach LOS					C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.8	41.7		0.0	0.0	48.5		14.5				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	46.0	46.0		17.0	4.0	46.0		17.0				
Max Q Clear Time (g_c+14), s	28.6	28.6		0.0	0.0	11.0		10.0				
Green Ext Time (p_c), s	0.0	9.2		0.0	0.0	12.7		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				14.7								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary
 4: Bass Lake Road & Country Club Drive

Cumulative No Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↖↗		↖	↖↗	
Traffic Volume (veh/h)	20	80	140	200	10	80	10	840	310	70	680	10
Future Volume (veh/h)	20	80	140	200	10	80	10	840	310	70	680	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.95	1.00		0.94	1.00		0.98
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1827	1900	1863	1863	1900
Adj Flow Rate, veh/h	21	84	147	211	11	84	10	875	323	73	708	10
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	2	2
Cap, veh/h	33	107	187	258	56	427	18	980	360	93	1586	22
Arrive On Green	0.02	0.19	0.19	0.15	0.32	0.32	0.01	0.40	0.40	0.05	0.44	0.44
Sat Flow, veh/h	1774	565	989	1774	177	1355	1774	2442	897	1774	3572	50
Grp Volume(v), veh/h	21	0	231	211	0	95	10	621	577	73	351	367
Grp Sat Flow(s),veh/h/ln	1774	0	1555	1774	0	1533	1774	1736	1604	1774	1770	1852
Q Serve(g_s), s	0.9	0.0	10.7	8.7	0.0	3.4	0.4	25.1	25.4	3.1	10.4	10.4
Cycle Q Clear(g_c), s	0.9	0.0	10.7	8.7	0.0	3.4	0.4	25.1	25.4	3.1	10.4	10.4
Prop In Lane	1.00		0.64	1.00		0.88	1.00		0.56	1.00		0.03
Lane Grp Cap(c), veh/h	33	0	293	258	0	483	18	697	644	93	786	823
V/C Ratio(X)	0.63	0.00	0.79	0.82	0.00	0.20	0.56	0.89	0.90	0.78	0.45	0.45
Avail Cap(c_a), veh/h	118	0	453	376	0	670	94	736	680	94	786	823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	0.0	29.2	31.3	0.0	18.9	37.2	21.0	21.1	35.3	14.5	14.5
Incr Delay (d2), s/veh	17.7	0.0	5.0	8.9	0.0	0.2	24.9	12.6	14.2	33.5	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	5.0	4.9	0.0	1.5	0.3	14.3	13.8	2.4	5.2	5.4
LnGrp Delay(d),s/veh	54.4	0.0	34.2	40.1	0.0	19.1	62.1	33.7	35.3	68.8	14.9	14.9
LnGrp LOS	D		C	D		B	E	C	D	E	B	B
Approach Vol, veh/h		252			306			1208			791	
Approach Delay, s/veh		35.9			33.6			34.7			19.9	
Approach LOS		D			C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	34.3	15.0	18.2	4.8	37.5	5.4	27.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	32.0	16.0	22.0	4.0	32.0	5.0	33.0				
Max Q Clear Time (g_c+15), s	4.0	27.4	10.7	12.7	2.4	12.4	2.9	5.4				
Green Ext Time (p_c), s	0.0	2.9	0.3	1.4	0.0	12.0	0.0	2.3				
Intersection Summary												
HCM 2010 Ctrl Delay				30.1								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
5: Bass Lake Road & US 50 WB Ramps

Cumulative No Project
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↕		↕			↕	↕
Traffic Volume (veh/h)	0	0	0	20	10	380	270	780	0	0	450	570
Future Volume (veh/h)	0	0	0	20	10	380	270	780	0	0	450	570
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1827	1827	1900	1845	0	0	1863	1863
Adj Flow Rate, veh/h				21	11	0	281	812	0	0	469	0
Adj No. of Lanes				0	1	1	0	2	0	0	1	1
Peak Hour Factor				0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				4	4	4	3	3	0	0	2	2
Cap, veh/h				27	14	37	0	3235	0	0	1720	1462
Arrive On Green				0.02	0.02	0.00	0.00	1.00	0.00	0.00	0.92	0.00
Sat Flow, veh/h				1161	608	1553	0	3597	0	0	1863	1583
Grp Volume(v), veh/h				32	0	0	0	812	0	0	469	0
Grp Sat Flow(s),veh/h/ln				1769	0	1553	0	1752	0	0	1863	1583
Q Serve(g_s), s				2.7	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
Cycle Q Clear(g_c), s				2.7	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
Prop In Lane				0.66		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				42	0	37	0	3235	0	0	1720	1462
V/C Ratio(X)				0.77	0.00	0.00	0.00	0.25	0.00	0.00	0.27	0.00
Avail Cap(c_a), veh/h				330	0	290	0	3235	0	0	1720	1462
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.66	0.00	0.00	0.88	0.00
Uniform Delay (d), s/veh				72.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Incr Delay (d2), s/veh				25.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.6	0.0	0.0	0.0	0.1	0.0	0.0	2.1	0.0
LnGrp Delay(d),s/veh				97.8	0.0	0.0	0.0	0.1	0.0	0.0	0.9	0.0
LnGrp LOS				F				A			A	
Approach Vol, veh/h					32			812			469	
Approach Delay, s/veh					97.8			0.1			0.9	
Approach LOS					F			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		142.5			0.0	142.5		7.5				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		114.0			4.0	106.0		28.0				
Max Q Clear Time (g_c+I1), s		2.0			0.0	5.9		4.7				
Green Ext Time (p_c), s		11.0			0.0	11.0		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				2.8								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary
 6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps

Cumulative No Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	740	10	470	0	0	0	0	310	10	390	80	0
Future Volume (veh/h)	740	10	470	0	0	0	0	310	10	390	80	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900				0	1827	1900	1900	1863	0
Adj Flow Rate, veh/h	519	351	265				0	326	10	411	84	0
Adj No. of Lanes	1	1	0				0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	2	2	0
Cap, veh/h	728	405	306				0	837	26	0	884	0
Arrive On Green	0.42	0.42	0.42				0.00	0.47	0.47	0.00	0.16	0.00
Sat Flow, veh/h	1740	967	730				0	1763	54	0	1863	0
Grp Volume(v), veh/h	519	0	616				0	0	336	0	84	0
Grp Sat Flow(s),veh/h/ln	1740	0	1697				0	0	1817	0	1863	0
Q Serve(g_s), s	18.5	0.0	24.9				0.0	0.0	8.9	0.0	2.9	0.0
Cycle Q Clear(g_c), s	18.5	0.0	24.9				0.0	0.0	8.9	0.0	2.9	0.0
Prop In Lane	1.00		0.43				0.00		0.03	0.00		0.00
Lane Grp Cap(c), veh/h	728	0	710				0	0	863	0	884	0
V/C Ratio(X)	0.71	0.00	0.87				0.00	0.00	0.39	0.00	0.09	0.00
Avail Cap(c_a), veh/h	905	0	882				0	0	863	0	884	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.00	1.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	18.1	0.0	19.9				0.0	0.0	12.7	0.0	17.8	0.0
Incr Delay (d2), s/veh	2.0	0.0	7.7				0.0	0.0	1.3	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	0.0	13.2				0.0	0.0	4.8	0.0	1.5	0.0
LnGrp Delay(d),s/veh	20.1	0.0	27.6				0.0	0.0	14.0	0.0	18.0	0.0
LnGrp LOS	C		C						B		B	
Approach Vol, veh/h		1135						336			84	
Approach Delay, s/veh		24.2						14.0			18.0	
Approach LOS		C						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	0.0	39.6		35.4		39.6						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	4.0	20.0		39.0		28.0						
Max Q Clear Time (g_c+10), s	4.0	10.9		26.9		4.9						
Green Ext Time (p_c), s	0.0	1.6		4.5		2.4						
Intersection Summary												
HCM 2010 Ctrl Delay			21.6									
HCM 2010 LOS			C									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑↑	↑↑	
Traffic Vol, veh/h	10	10	10	300	510	30
Future Vol, veh/h	10	10	10	300	510	30
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	12	12	8	8
Mvmt Flow	11	11	11	316	537	32

Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	736	288	570	0
Stage 1	555	-	-	-
Stage 2	181	-	-	-
Critical Hdwy	6.84	6.94	4.34	-
Critical Hdwy Stg 1	5.84	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-
Follow-up Hdwy	3.52	3.32	2.32	-
Pot Cap-1 Maneuver	354	709	933	-
Stage 1	539	-	-	-
Stage 2	832	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	348	707	931	-
Mov Cap-2 Maneuver	348	-	-	-
Stage 1	538	-	-	-
Stage 2	819	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	931	-	466	-	-
HCM Lane V/C Ratio	0.011	-	0.045	-	-
HCM Control Delay (s)	8.9	0.1	13.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Traffic Vol, veh/h	510	10	10	290	10	10
Future Vol, veh/h	510	10	10	290	10	10
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	537	11	11	305	11	11

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	549
Stage 1	-	-	544
Stage 2	-	-	176
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	1017
Stage 1	-	-	546
Stage 2	-	-	837
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1015
Mov Cap-2 Maneuver	-	-	357
Stage 1	-	-	545
Stage 2	-	-	825

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	477	-	-	1015	-
HCM Lane V/C Ratio	0.044	-	-	0.01	-
HCM Control Delay (s)	12.9	-	-	8.6	0.1
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	98.9
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	260	10	20	0	20	10	10	0	20	430	60
Future Vol, veh/h	0	260	10	20	0	20	10	10	0	20	430	60
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.81	0.81	0.81	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	302	12	23	0	25	12	12	0	21	453	63
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	27.1	13.9	59
HCM LOS	D	B	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	90%	50%	2%
Vol Thru, %	84%	3%	25%	73%
Vol Right, %	12%	7%	25%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	510	290	40	630
LT Vol	20	260	20	10
Through Vol	430	10	10	460
RT Vol	60	20	10	160
Lane Flow Rate	537	337	49	716
Geometry Grp	1	1	1	1
Degree of Util (X)	0.969	0.691	0.12	1.3
Departure Headway (Hd)	7.049	8.02	9.553	6.536
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	521	455	378	558
Service Time	5.049	6.02	7.553	4.541
HCM Lane V/C Ratio	1.031	0.741	0.13	1.283
HCM Control Delay	59	27.1	13.9	168.6
HCM Lane LOS	F	D	B	F
HCM 95th-tile Q	12.7	5.2	0.4	29.7

Intersection


















Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	10	460	160
Future Vol, veh/h	0	10	460	160
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	11	523	182
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	168.6
HCM LOS	F























HCM Unsignalized Intersection Capacity Analysis
 10: Cambridge Road & Knollwood Drive

Cumulative No Project
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	60	280	350	90	100	430	420	320	80	430	10
Future Volume (Veh/h)	10	60	280	350	90	100	430	420	320	80	430	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.90	0.90	0.90	0.91	0.91	0.91
Hourly flow rate (vph)	11	65	304	467	120	133	478	467	356	88	473	11
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	2274	2438	482	2596	2265	649	486			825		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2486	2694	482	2896	2474	416	486			640		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	48	0	0	73	56			88		
cM capacity (veh/h)	0	8	582	0	11	498	1075			740		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	380	720	478	823	572							
Volume Left	11	467	478	0	88							
Volume Right	304	133	0	356	11							
cSH	0	0	1075	1700	740							
Volume to Capacity	Err	Err	0.44	0.48	0.12							
Queue Length 95th (ft)	Err	Err	58	0	10							
Control Delay (s)	Err	Err	11.0	0.0	3.1							
Lane LOS	F	F	B		A							
Approach Delay (s)	Err	Err	4.0		3.1							
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			134.1%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary
 11: Cambridge Road & Merrychase Drive/US 50 WB Ramps

Cumulative No Project
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	80	180	280	210	540	160	690	10	390	740	70
Future Volume (veh/h)	70	80	180	280	210	540	160	690	10	390	740	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	80	91	0	315	236	495	176	758	0	433	822	70
Adj No. of Lanes	0	1	1	0	1	2	1	2	1	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	96	157	299	224	1457	207	764	342	417	1103	94
Arrive On Green	0.10	0.10	0.00	0.29	0.29	0.29	0.12	0.22	0.00	0.23	0.33	0.33
Sat Flow, veh/h	852	969	1583	1035	776	2777	1774	3539	1583	1774	3301	281
Grp Volume(v), veh/h	171	0	0	551	0	495	176	758	0	433	441	451
Grp Sat Flow(s),veh/h/ln	1820	0	1583	1811	0	1389	1774	1770	1583	1774	1770	1812
Q Serve(g_s), s	9.3	0.0	0.0	28.9	0.0	10.3	9.7	21.4	0.0	23.5	22.1	22.1
Cycle Q Clear(g_c), s	9.3	0.0	0.0	28.9	0.0	10.3	9.7	21.4	0.0	23.5	22.1	22.1
Prop In Lane	0.47		1.00	0.57		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	180	0	157	523	0	1457	207	764	342	417	592	606
V/C Ratio(X)	0.95	0.00	0.00	1.05	0.00	0.34	0.85	0.99	0.00	1.04	0.74	0.74
Avail Cap(c_a), veh/h	180	0	157	523	0	1457	239	764	342	417	592	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	0.0	0.0	35.6	0.0	13.8	43.3	39.1	0.0	38.3	29.5	29.5
Incr Delay (d2), s/veh	51.7	0.0	0.0	54.0	0.0	0.1	19.6	30.3	0.0	54.4	4.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.0	0.0	22.2	0.0	4.0	5.9	13.6	0.0	17.8	11.5	11.8
LnGrp Delay(d),s/veh	96.5	0.0	0.0	89.5	0.0	13.8	62.9	69.4	0.0	92.7	34.0	33.9
LnGrp LOS	F			F		B	E	E		F	C	C
Approach Vol, veh/h		171			1046			934			1325	
Approach Delay, s/veh		96.5			53.7			68.2			53.2	
Approach LOS		F			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	27.0	26.0		14.0	15.2	37.8		33.0				
Change Period (Y+Rc), s	3.5	4.4		4.1	3.5	4.4		4.1				
Max Green Setting (Gmax), s	23.5	21.6		9.9	13.5	31.6		28.9				
Max Q Clear Time (g_c+I1), s	25.5	23.4		11.3	11.7	24.1		30.9				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	3.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			59.5									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary
 12: Cambridge Road & US 50 EB Ramps

Cumulative No Project
 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	590	40	190	270	490	710		
Future Volume (veh/h)	590	40	190	270	490	710		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	641	0	207	293	533	0		
Adj No. of Lanes	2	1	1	1	2	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	816	375	260	1031	1069	478		
Arrive On Green	0.24	0.00	0.15	0.55	0.30	0.00		
Sat Flow, veh/h	3442	1583	1774	1863	3632	1583		
Grp Volume(v), veh/h	641	0	207	293	533	0		
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1863	1770	1583		
Q Serve(g_s), s	6.7	0.0	4.3	3.2	4.7	0.0		
Cycle Q Clear(g_c), s	6.7	0.0	4.3	3.2	4.7	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	816	375	260	1031	1069	478		
V/C Ratio(X)	0.79	0.00	0.80	0.28	0.50	0.00		
Avail Cap(c_a), veh/h	901	415	279	1561	2039	912		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	13.7	0.0	15.7	4.5	10.9	0.0		
Incr Delay (d2), s/veh	4.2	0.0	13.9	0.1	0.4	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.6	0.0	3.1	1.7	2.3	0.0		
LnGrp Delay(d),s/veh	17.9	0.0	29.7	4.7	11.3	0.0		
LnGrp LOS	B		C	A	B			
Approach Vol, veh/h	641			500	533			
Approach Delay, s/veh	17.9			15.0	11.3			
Approach LOS	B			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		25.1		13.0	9.6	15.5		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		32.0		10.0	6.0	22.0		
Max Q Clear Time (g_c+I1), s		5.2		8.7	6.3	6.7		
Green Ext Time (p_c), s		5.8		0.4	0.0	4.7		
Intersection Summary								
HCM 2010 Ctrl Delay			14.9					
HCM 2010 LOS			B					

HCM 2010 TWSC
 13: Flying C Road & Crazy Horse Road & Cambridge Road

Cumulative No Project
 PM Peak Hour

Intersection												
Int Delay, s/veh	13.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	↕
Traffic Vol, veh/h	70	10	10	50	10	120	10	280	50	150	270	120
Future Vol, veh/h	70	10	10	50	10	120	10	280	50	150	270	120
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	71	71	71	95	95	95	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	89	13	13	70	14	169	11	295	53	156	281	125
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1032	966	285	952	940	325	283	0	0	349	0	0
Stage 1	596	596	-	344	344	-	-	-	-	-	-	-
Stage 2	436	370	-	608	596	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	211	255	754	239	264	716	1279	-	-	1210	-	-
Stage 1	490	492	-	671	637	-	-	-	-	-	-	-
Stage 2	599	620	-	483	492	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	137	219	751	200	227	714	1277	-	-	1208	-	-
Mov Cap-2 Maneuver	137	219	-	200	227	-	-	-	-	-	-	-
Stage 1	484	428	-	663	629	-	-	-	-	-	-	-
Stage 2	441	612	-	401	428	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	71.5			29.8			0.2			2.3		
HCM LOS	F			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1277	-	-	158	390	1208	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.721	0.65	0.129	-	-				
HCM Control Delay (s)	7.8	0	-	71.5	29.8	8.4	-	-				
HCM Lane LOS	A	A	-	F	D	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	4.3	4.4	0.4	-	-				

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	10	40	330	10	30	310
Future Vol, veh/h	10	40	330	10	30	310
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	42	347	11	32	326
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	746	357	0	0	360	0
Stage 1	355	-	-	-	-	-
Stage 2	391	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	381	687	-	-	1199	-
Stage 1	710	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	367	685	-	-	1197	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0.7		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	584	1197	-	
HCM Lane V/C Ratio	-	-	0.09	0.026	-	
HCM Control Delay (s)	-	-	11.8	8.1	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley TIA
Cumulative No Project Conditions
PM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1,210	1,177	97.2%	72.1	19.0	E
	Through	1,540	1,553	100.9%	21.2	2.9	C
	Right Turn	200	194	97.1%	6.4	0.7	A
	Subtotal	2,950	2,924	99.1%	40.9	8.0	D
SB	Left Turn	40	39	97.5%	67.9	12.1	E
	Through	1,170	1,182	101.0%	39.3	4.1	D
	Right Turn	260	254	97.7%	6.0	1.1	A
	Subtotal	1,470	1,475	100.4%	34.1	3.7	C
EB	Left Turn	210	205	97.8%	63.9	10.7	E
	Through	40	37	93.3%	67.0	13.4	E
	Right Turn	240	244	101.7%	3.4	0.5	A
	Subtotal	490	487	99.3%	33.5	7.0	C
WB	Left Turn	130	132	101.4%	65.2	7.8	E
	Through	10	9	91.0%	57.0	36.2	E
	Right Turn	80	76	95.4%	19.6	8.0	B
	Subtotal	220	217	98.7%	49.0	5.6	D
Total		5,130	5,103	99.5%	38.7	4.2	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley TIA
Cumulative No Project Conditions
PM Peak Hour

Intersection 16




















Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	2,210	2,189	99.0%	9.5	1.5	A
	Right Turn	350	341	97.3%	9.7	0.8	A
	Subtotal	2,560	2,529	98.8%	9.5	1.3	A
SB	Left Turn	190	185	97.4%	36.1	4.6	D
	Through	1,350	1,371	101.5%	26.0	11.3	C
	Right Turn						
	Subtotal	1,540	1,556	101.0%	27.3	10.1	C
EB	Left Turn						
	Through						
	Right Turn	730	714	97.7%	12.5	2.7	B
	Subtotal	730	714	97.7%	12.5	2.7	B
WB	Left Turn						
	Through						
	Right Turn	740	750	101.4%	2.1	0.3	A
	Subtotal	740	750	101.4%	2.1	0.3	A
Total		5,570	5,549	99.6%	14.0	2.4	B

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US-50 WB Ramps






















Cumulative No Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	690	10	360	0	540	80	0	590	670
Future Volume (veh/h)	0	0	0	690	10	360	0	540	80	0	590	670
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h				734	0	255	0	568	0	0	621	279
Adj No. of Lanes				2	0	1	0	2	1	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	2	2	0	2	2	0	2	2
Cap, veh/h				1331	0	594	0	1504	673	0	1504	673
Arrive On Green				0.38	0.00	0.38	0.00	0.85	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3548	0	1583	0	3632	1583	0	3632	1583
Grp Volume(v), veh/h				734	0	255	0	568	0	0	621	279
Grp Sat Flow(s),veh/h/ln				1774	0	1583	0	1770	1583	0	1770	1583
Q Serve(g_s), s				6.5	0.0	4.8	0.0	1.4	0.0	0.0	4.9	4.9
Cycle Q Clear(g_c), s				6.5	0.0	4.8	0.0	1.4	0.0	0.0	4.9	4.9
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1331	0	594	0	1504	673	0	1504	673
V/C Ratio(X)				0.55	0.00	0.43	0.00	0.38	0.00	0.00	0.41	0.41
Avail Cap(c_a), veh/h				1331	0	594	0	1504	673	0	1504	673
HCM Platoon Ratio				1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	0.98	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				9.9	0.0	9.3	0.0	1.8	0.0	0.0	8.0	8.0
Incr Delay (d2), s/veh				1.7	0.0	2.3	0.0	0.7	0.0	0.0	0.8	1.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.5	0.0	2.4	0.0	0.6	0.0	0.0	2.5	2.4
LnGrp Delay(d),s/veh				11.5	0.0	11.6	0.0	2.5	0.0	0.0	8.9	9.9
LnGrp LOS				B		B		A			A	A
Approach Vol, veh/h					989			568			900	
Approach Delay, s/veh					11.5			2.5			9.2	
Approach LOS					B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		21.0				21.0		19.0				
Change Period (Y+Rc), s		4.0				4.0		4.0				
Max Green Setting (Gmax), s		17.0				17.0		15.0				
Max Q Clear Time (g_c+I1), s		3.4				6.9		8.5				
Green Ext Time (p_c), s		6.9				5.7		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay				8.6								
HCM 2010 LOS				A								
Notes												

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US-50 EB Ramps

Cumulative No Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	160	0	50	0	0	0	0	460	360	0	960	320
Future Volume (veh/h)	160	0	50	0	0	0	0	460	360	0	960	320
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h	168	0	5				0	484	0	0	1011	0
Adj No. of Lanes	2	0	1				0	2	1	0	2	1
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	295	0	136				0	2528	1131	0	2528	1131
Arrive On Green	0.09	0.00	0.09				0.00	0.71	0.00	0.00	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	0	3632	1583
Grp Volume(v), veh/h	168	0	5				0	484	0	0	1011	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	0	1770	1583
Q Serve(g_s), s	1.9	0.0	0.1				0.0	1.8	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.1				0.0	1.8	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	295	0	136				0	2528	1131	0	2528	1131
V/C Ratio(X)	0.57	0.00	0.04				0.00	0.19	0.00	0.00	0.40	0.00
Avail Cap(c_a), veh/h	602	0	277				0	2528	1131	0	2528	1131
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.87	0.00
Uniform Delay (d), s/veh	17.6	0.0	16.8				0.0	1.9	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.1				0.0	0.2	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1				0.0	0.9	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	19.3	0.0	16.9				0.0	2.1	0.0	0.0	0.4	0.0
LnGrp LOS	B		B					A			A	
Approach Vol, veh/h		173						484			1011	
Approach Delay, s/veh		19.2						2.1			0.4	
Approach LOS		B						A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		32.6		7.4		32.6						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		25.0		7.0		25.0						
Max Q Clear Time (g_c+I1), s		3.8		3.9		2.0						
Green Ext Time (p_c), s		10.0		0.1		10.5						
Intersection Summary												
HCM 2010 Ctrl Delay			2.8									
HCM 2010 LOS			A									

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley TIA
Cumulative No Project Conditions
PM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	50	54	108.6%	73.6	18.0	E
	Through	1,610	1,607	99.8%	47.3	3.1	D
	Right Turn	170	170	99.9%	7.1	0.9	A
	Subtotal	1,830	1,831	100.1%	44.4	3.2	D
SB	Left Turn	100	104	103.6%	60.0	12.8	E
	Through	900	912	101.3%	26.6	4.2	C
	Right Turn	190	200	105.3%	6.2	1.3	A
	Subtotal	1,190	1,216	102.1%	26.2	3.2	C
EB	Left Turn	570	565	99.2%	92.3	25.7	F
	Through	180	183	101.4%	42.0	7.6	D
	Right Turn	460	451	98.0%	16.7	3.1	B
	Subtotal	1,210	1,199	99.1%	56.8	12.3	E
WB	Left Turn	110	115	104.1%	74.3	14.7	E
	Through	170	171	100.8%	59.2	7.9	E
	Right Turn	200	203	101.4%	18.8	4.8	B
	Subtotal	480	489	101.8%	46.2	7.1	D
Total		4,710	4,734	100.5%	43.2	3.5	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley TIA
Cumulative No Project Conditions
PM Peak Hour

Intersection 21

Latrobe Rd/Town Center Blvd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	10	9	92.0%	125.9	40.1	F
	Through	1,730	1,699	98.2%	119.4	24.7	F
	Right Turn	40	40	100.0%	5.0	1.7	A
	Subtotal	1,780	1,748	98.2%	116.9	24.3	F
SB	Left Turn	510	508	99.6%	104.4	33.4	F
	Through	1,560	1,567	100.4%	22.8	4.4	C
	Right Turn	10	9	88.0%	1.4	1.2	A
	Subtotal	2,080	2,083	100.1%	42.7	10.2	D
EB	Left Turn	190	188	98.8%	53.2	3.8	D
	Through	30	27	91.0%	47.1	13.1	D
	Right Turn	90	90	99.6%	25.1	7.8	C
	Subtotal	310	305	98.3%	44.5	4.0	D
WB	Left Turn	60	58	96.7%	81.9	27.3	F
	Through	10	11	110.0%	83.6	37.7	F
	Right Turn	640	646	101.0%	45.7	26.7	D
	Subtotal	710	715	100.7%	50.0	26.0	D
Total		4,880	4,851	99.4%	71.5	9.8	E

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement























Marble Valley TIA
Cumulative No Project Conditions
PM Peak Hour

Intersection 22 Latrobe Rd/White Rock Rd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	170	160	94.1%	86.2	26.4	F
	Through	860	854	99.3%	69.0	42.1	E
	Right Turn	430	433	100.8%	35.4	29.1	D
	Subtotal	1,460	1,447	99.1%	61.3	37.9	E
SB	Left Turn	260	256	98.3%	43.6	5.8	D
	Through	1,020	1,035	101.5%	23.5	1.9	C
	Right Turn	430	426	99.1%	15.2	2.2	B
	Subtotal	1,710	1,717	100.4%	24.4	1.8	C
EB	Left Turn	710	724	102.0%	98.7	40.9	F
	Through	540	535	99.1%	40.2	2.9	D
	Right Turn	240	242	100.9%	34.3	6.6	C
	Subtotal	1,490	1,502	100.8%	68.1	20.7	E
WB	Left Turn	280	278	99.3%	66.8	6.3	E
	Through	390	398	102.0%	58.5	5.1	E
	Right Turn	210	216	102.9%	6.0	1.8	A
	Subtotal	880	892	101.3%	48.2	4.7	D
Total		5,540	5,558	100.3%	49.3	10.7	D

HCM 2010 Signalized Intersection Summary
 1: Bass Lake Road & Serrano Parkway

Cumulative Plus Project
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	200	10	10	340	430	10	10	10	120	10	310
Future Volume (veh/h)	200	200	10	10	340	430	10	10	10	120	10	310
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1810	1810	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	253	253	6	11	395	178	11	11	0	140	11	10
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.79	0.79	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Percent Heavy Veh, %	5	5	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	312	858	749	20	566	480	137	144	0	229	116	105
Arrive On Green	0.18	0.47	0.47	0.01	0.30	0.30	0.08	0.08	0.00	0.13	0.13	0.13
Sat Flow, veh/h	1723	1810	1580	1774	1863	1578	1774	1863	0	1774	896	815
Grp Volume(v), veh/h	253	253	6	11	395	178	11	11	0	140	0	21
Grp Sat Flow(s),veh/h/ln	1723	1810	1580	1774	1863	1578	1774	1863	0	1774	0	1711
Q Serve(g_s), s	7.3	4.4	0.1	0.3	9.7	4.6	0.3	0.3	0.0	3.9	0.0	0.6
Cycle Q Clear(g_c), s	7.3	4.4	0.1	0.3	9.7	4.6	0.3	0.3	0.0	3.9	0.0	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.48
Lane Grp Cap(c), veh/h	312	858	749	20	566	480	137	144	0	229	0	221
V/C Ratio(X)	0.81	0.30	0.01	0.55	0.70	0.37	0.08	0.08	0.00	0.61	0.00	0.09
Avail Cap(c_a), veh/h	498	1360	1187	137	1005	852	1128	1185	0	1128	0	1088
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.4	8.3	7.2	25.5	15.9	14.2	22.2	22.2	0.0	21.4	0.0	19.9
Incr Delay (d2), s/veh	5.3	0.2	0.0	21.3	1.6	0.5	0.2	0.2	0.0	2.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	2.2	0.0	0.3	5.2	2.0	0.2	0.2	0.0	2.0	0.0	0.3
LnGrp Delay(d),s/veh	25.7	8.5	7.2	46.9	17.5	14.6	22.5	22.5	0.0	24.0	0.0	20.1
LnGrp LOS	C	A	A	D	B	B	C	C		C		C
Approach Vol, veh/h		512			584			22				161
Approach Delay, s/veh		17.0			17.2			22.5				23.5
Approach LOS		B			B			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	28.6		10.7	13.4	19.8		8.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	39.0		33.0	15.0	28.0		33.0				
Max Q Clear Time (g_c+I1), s	2.3	6.4		5.9	9.3	11.7		2.3				
Green Ext Time (p_c), s	0.0	4.3		0.5	0.3	3.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			18.0									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary
 2: Bass Lake Road & Driveway/Hollow Oak Drive

Cumulative Plus Project
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	0	0	0	220	0	70	0	470	100	40	940	0
Future Volume (veh/h)	0	0	0	220	0	70	0	470	100	40	940	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1810	1810	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	278	0	4	0	618	125	49	1146	0
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.79	0.79	0.79	0.76	0.76	0.76	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	2	2	2
Cap, veh/h	0	2	0	325	0	5	2	910	184	62	1321	0
Arrive On Green	0.00	0.00	0.00	0.19	0.00	0.19	0.00	0.62	0.62	0.03	0.71	0.00
Sat Flow, veh/h	0	1863	0	1740	0	25	1723	1461	296	1774	1863	0
Grp Volume(v), veh/h	0	0	0	282	0	0	0	0	743	49	1146	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1765	0	0	1723	0	1757	1774	1863	0
Q Serve(g_s), s	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	21.3	2.1	35.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	21.3	2.1	35.9	0.0
Prop In Lane	0.00		0.00	0.99		0.01	1.00		0.17	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	330	0	0	2	0	1094	62	1321	0
V/C Ratio(X)	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.68	0.79	0.87	0.00
Avail Cap(c_a), veh/h	0	410	0	389	0	0	89	0	1456	138	1592	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	30.4	0.0	0.0	0.0	0.0	9.5	37.0	8.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	14.8	0.0	0.0	0.0	0.0	0.8	20.0	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	10.4	1.4	19.5	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	45.2	0.0	0.0	0.0	0.0	10.3	57.0	13.1	0.0
LnGrp LOS				D					B	E	B	
Approach Vol, veh/h		0			282			743			1195	
Approach Delay, s/veh		0.0			45.2			10.3			14.9	
Approach LOS					D			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	52.1		0.0	0.0	58.8		18.4				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	64.0		17.0	4.0	66.0		17.0				
Max Q Clear Time (g_c+14), s	14.0	23.3		0.0	0.0	37.9		13.9				
Green Ext Time (p_c), s	0.0	20.7		0.0	0.0	16.9		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				17.2								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary
 4: Bass Lake Road & Country Club Drive

Cumulative Plus Project
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	50	130	60	160	100	360	450	180	160	910	140
Future Volume (veh/h)	30	50	130	60	160	100	360	450	180	160	910	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1827	1827	1863	1863	1900
Adj Flow Rate, veh/h	32	53	43	63	168	81	379	474	82	168	958	136
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	2	2
Cap, veh/h	44	142	115	105	218	105	419	889	754	205	1139	162
Arrive On Green	0.03	0.15	0.15	0.06	0.18	0.18	0.24	0.49	0.49	0.12	0.37	0.37
Sat Flow, veh/h	1774	953	773	1774	1187	572	1774	1827	1550	1774	3111	442
Grp Volume(v), veh/h	32	0	96	63	0	249	379	474	82	168	545	549
Grp Sat Flow(s),veh/h/ln	1774	0	1726	1774	0	1760	1774	1827	1550	1774	1770	1783
Q Serve(g_s), s	1.5	0.0	4.2	2.9	0.0	11.4	17.5	15.2	2.4	7.8	23.8	23.8
Cycle Q Clear(g_c), s	1.5	0.0	4.2	2.9	0.0	11.4	17.5	15.2	2.4	7.8	23.8	23.8
Prop In Lane	1.00		0.45	1.00		0.33	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	44	0	257	105	0	322	419	889	754	205	648	653
V/C Ratio(X)	0.72	0.00	0.37	0.60	0.00	0.77	0.91	0.53	0.11	0.82	0.84	0.84
Avail Cap(c_a), veh/h	126	0	450	336	0	667	483	909	771	294	692	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	0.0	32.4	38.7	0.0	32.8	31.3	15.0	11.8	36.4	24.5	24.5
Incr Delay (d2), s/veh	19.6	0.0	0.9	5.4	0.0	3.9	18.8	0.6	0.1	11.3	8.7	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	2.1	1.6	0.0	5.9	10.7	7.8	1.0	4.5	13.1	13.3
LnGrp Delay(d),s/veh	60.5	0.0	33.3	44.1	0.0	36.7	50.1	15.6	11.8	47.8	33.2	33.2
LnGrp LOS	E		C	D		D	D	B	B	D	C	C
Approach Vol, veh/h		128			312			935			1262	
Approach Delay, s/veh		40.1			38.2			29.3			35.1	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	3.8	45.1	9.0	16.6	23.9	34.9	6.1	19.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	42.0	16.0	22.0	23.0	33.0	6.0	32.0				
Max Q Clear Time (g_c+1.0), s	1.0	17.2	4.9	6.2	19.5	25.8	3.5	13.4				
Green Ext Time (p_c), s	0.2	11.9	0.1	1.8	0.4	5.1	0.0	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			33.7									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
5: Bass Lake Road & US 50 WB Ramps

Cumulative Plus Project
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↕		↕			↕	↕
Traffic Volume (veh/h)	0	0	0	20	10	250	980	730	0	0	550	550
Future Volume (veh/h)	0	0	0	20	10	250	980	730	0	0	550	550
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1827	1827	1900	1845	0	0	1863	1863
Adj Flow Rate, veh/h				21	11	0	1032	768	0	0	579	0
Adj No. of Lanes				0	1	1	0	2	0	0	1	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				4	4	4	3	3	0	0	2	2
Cap, veh/h				39	20	52	0	3014	0	0	770	654
Arrive On Green				0.03	0.03	0.00	0.66	1.00	0.00	0.00	0.41	0.00
Sat Flow, veh/h				1161	608	1553	0	3597	0	0	1863	1583
Grp Volume(v), veh/h				32	0	0	0	768	0	0	579	0
Grp Sat Flow(s),veh/h/ln				1769	0	1553	0	1752	0	0	1863	1583
Q Serve(g_s), s				1.3	0.0	0.0	0.0	0.0	0.0	0.0	19.8	0.0
Cycle Q Clear(g_c), s				1.3	0.0	0.0	0.0	0.0	0.0	0.0	19.8	0.0
Prop In Lane				0.66		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				59	0	52	0	3014	0	0	770	654
V/C Ratio(X)				0.54	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.00
Avail Cap(c_a), veh/h				660	0	580	0	3014	0	0	770	654
HCM Platoon Ratio				1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.39	0.00
Uniform Delay (d), s/veh				35.7	0.0	0.0	0.0	0.0	0.0	0.0	18.7	0.0
Incr Delay (d2), s/veh				7.6	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.0	0.0	0.0	0.0	10.7	0.0
LnGrp Delay(d),s/veh				43.3	0.0	0.0	0.0	0.0	0.0	0.0	21.4	0.0
LnGrp LOS				D				A			C	
Approach Vol, veh/h					32			768			579	
Approach Delay, s/veh					43.3			0.0			21.4	
Approach LOS					D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		68.5			33.5	35.0		6.5				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		39.0			4.0	31.0		28.0				
Max Q Clear Time (g_c+I1), s		2.0			0.0	21.8		3.3				
Green Ext Time (p_c), s		5.3			0.0	2.6		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				10.0								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary
 6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps

Cumulative Plus Project
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	10	470	0	0	0	0	1360	10	310	260	0
Future Volume (veh/h)	350	10	470	0	0	0	0	1360	10	310	260	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900				0	1827	1900	1900	1863	0
Adj Flow Rate, veh/h	256	168	133				0	1432	11	326	274	0
Adj No. of Lanes	1	1	0				0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	2	2	0
Cap, veh/h	325	176	140				0	893	7	236	199	0
Arrive On Green	0.19	0.19	0.19				0.00	0.49	0.49	0.40	0.40	0.00
Sat Flow, veh/h	1740	944	748				0	1811	14	985	828	0
Grp Volume(v), veh/h	256	0	301				0	0	1443	600	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1692				0	0	1824	1813	0	0
Q Serve(g_s), s	21.0	0.0	26.4				0.0	0.0	74.0	36.0	0.0	0.0
Cycle Q Clear(g_c), s	21.0	0.0	26.4				0.0	0.0	74.0	36.0	0.0	0.0
Prop In Lane	1.00		0.44				0.00		0.01	0.54		0.00
Lane Grp Cap(c), veh/h	325	0	316				0	0	900	435	0	0
V/C Ratio(X)	0.79	0.00	0.95				0.00	0.00	1.60	1.38	0.00	0.00
Avail Cap(c_a), veh/h	325	0	316				0	0	900	435	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	0.00	1.00	0.91	0.00	0.00
Uniform Delay (d), s/veh	58.2	0.0	60.3				0.0	0.0	38.0	44.9	0.0	0.0
Incr Delay (d2), s/veh	12.2	0.0	38.1				0.0	0.0	276.7	183.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	15.7				0.0	0.0	106.4	40.1	0.0	0.0
LnGrp Delay(d),s/veh	70.4	0.0	98.5				0.0	0.0	314.7	228.0	0.0	0.0
LnGrp LOS	E		F						F	F		
Approach Vol, veh/h		557						1443			600	
Approach Delay, s/veh		85.6						314.7			228.0	
Approach LOS		F						F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		78.0		32.0		40.0						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		74.0		28.0		36.0						
Max Q Clear Time (g_c+I1), s		76.0		28.4		38.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			245.6									
HCM 2010 LOS			F									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑↑	↑↑	
Traffic Vol, veh/h	30	10	10	1340	710	10
Future Vol, veh/h	30	10	10	1340	710	10
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	12	12	8	8
Mvmt Flow	32	11	11	1411	747	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1483	383	760	0	-	0
Stage 1	755	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.34	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.32	-	-	-
Pot Cap-1 Maneuver	116	615	785	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	439	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	108	613	784	-	-	-
Mov Cap-2 Maneuver	108	-	-	-	-	-
Stage 1	424	-	-	-	-	-
Stage 2	410	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.9	0.4	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	784	-	136	-	-
HCM Lane V/C Ratio	0.013	-	0.31	-	-
HCM Control Delay (s)	9.7	0.3	42.9	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

Intersection

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Traffic Vol, veh/h	710	10	10	1340	10	10
Future Vol, veh/h	710	10	10	1340	10	10
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	747	11	11	1411	11	11

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	760	1483
Stage 1	-	-	755
Stage 2	-	-	728
Critical Hdwy	-	4.14	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	2.22	3.52
Pot Cap-1 Maneuver	-	848	116
Stage 1	-	-	425
Stage 2	-	-	439
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	847	109
Mov Cap-2 Maneuver	-	-	109
Stage 1	-	-	424
Stage 2	-	-	412

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	26.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	185	-	-	847	-
HCM Lane V/C Ratio	0.114	-	-	0.012	-
HCM Control Delay (s)	26.9	-	-	9.3	0.3
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Intersection Delay, s/veh	196.6
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	90	10	30	0	80	30	10	0	20	360	30
Future Vol, veh/h	0	90	10	30	0	80	30	10	0	20	360	30
Peak Hour Factor	0.92	0.56	0.56	0.56	0.92	0.58	0.58	0.58	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	18	54	0	138	52	17	0	26	462	38
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	23.8	22.5	82.1
HCM LOS	C	C	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	69%	67%	3%
Vol Thru, %	88%	8%	25%	77%
Vol Right, %	7%	23%	8%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	410	130	120	730
LT Vol	20	90	80	20
Through Vol	360	10	30	560
RT Vol	30	30	10	150
Lane Flow Rate	526	232	207	880
Geometry Grp	1	1	1	1
Degree of Util (X)	1.035	0.534	0.487	1.722
Departure Headway (Hd)	8.352	9.931	10.194	7.216
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	442	367	356	510
Service Time	6.352	7.931	8.194	5.216
HCM Lane V/C Ratio	1.19	0.632	0.581	1.725
HCM Control Delay	82.1	23.8	22.5	351.5
HCM Lane LOS	F	C	C	F
HCM 95th-tile Q	13.9	3	2.6	51.3

Intersection


















Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	20	560	150
Future Vol, veh/h	0	20	560	150
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	24	675	181
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	351.5
HCM LOS	F

HCM Unsignalized Intersection Capacity Analysis
 10: Cambridge Road & Knollwood Drive

Cumulative Plus Project
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	50	470	210	40	40	320	370	250	70	630	10
Future Volume (Veh/h)	10	50	470	210	40	40	320	370	250	70	630	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.50	0.50	0.50	0.81	0.81	0.81	0.83	0.83	0.83
Hourly flow rate (vph)	13	63	588	420	80	80	395	457	309	84	759	12
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	2304	2493	769	2958	2344	616	773			768		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2513	2751	769	3337	2564	386	773			578		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	0	0	0	85	53			89		
cM capacity (veh/h)	0	7	400	0	10	524	841			789		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	664	580	395	766	855							
Volume Left	13	420	395	0	84							
Volume Right	588	80	0	309	12							
cSH	0	0	841	1700	789							
Volume to Capacity	Err	Err	0.47	0.45	0.11							
Queue Length 95th (ft)	Err	Err	64	0	9							
Control Delay (s)	Err	Err	13.0	0.0	2.8							
Lane LOS	F	F	B		A							
Approach Delay (s)	Err	Err	4.4		2.8							
Approach LOS	F	F										
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization			134.4%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary
 11: Cambridge Road & Merrychase Drive/US 50 WB Ramps

Cumulative Plus Project
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↗	↖	↗	
Traffic Volume (veh/h)	50	190	220	350	270	310	120	580	90	500	700	100
Future Volume (veh/h)	50	190	220	350	270	310	120	580	90	500	700	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	69	264	31	530	409	267	169	817	0	521	729	96
Adj No. of Lanes	0	1	1	0	1	2	1	2	1	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.66	0.66	0.66	0.71	0.71	0.71	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	185	200	382	295	1565	181	708	317	343	916	121
Arrive On Green	0.13	0.13	0.13	0.37	0.37	0.37	0.10	0.20	0.00	0.19	0.29	0.29
Sat Flow, veh/h	382	1462	1576	1023	789	2779	1774	3539	1583	1774	3144	414
Grp Volume(v), veh/h	333	0	31	939	0	267	169	817	0	521	410	415
Grp Sat Flow(s),veh/h/ln	1844	0	1576	1812	0	1390	1774	1770	1583	1774	1770	1788
Q Serve(g_s), s	19.0	0.0	2.6	56.0	0.0	7.0	14.2	30.0	0.0	29.0	32.1	32.1
Cycle Q Clear(g_c), s	19.0	0.0	2.6	56.0	0.0	7.0	14.2	30.0	0.0	29.0	32.1	32.1
Prop In Lane	0.21		1.00	0.56		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	234	0	200	676	0	1565	181	708	317	343	516	521
V/C Ratio(X)	1.43	0.00	0.16	1.39	0.00	0.17	0.93	1.15	0.00	1.52	0.80	0.80
Avail Cap(c_a), veh/h	234	0	200	676	0	1565	181	708	317	343	516	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.5	0.0	58.4	47.0	0.0	15.9	66.8	60.0	0.0	60.5	49.0	49.1
Incr Delay (d2), s/veh	214.7	0.0	0.1	183.8	0.0	0.0	47.5	84.9	0.0	248.0	7.8	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.6	0.0	1.2	62.5	0.0	2.7	9.3	23.0	0.0	37.8	16.8	17.0
LnGrp Delay(d),s/veh	280.2	0.0	58.5	230.8	0.0	15.9	114.4	144.9	0.0	308.5	56.8	56.9
LnGrp LOS	F		E	F		B	F	F		F	E	E
Approach Vol, veh/h		364			1206			986			1346	
Approach Delay, s/veh		261.3			183.2			139.7			154.3	
Approach LOS		F			F			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	33.0	34.0		23.0	19.3	47.7		60.0				
Change Period (Y+Rc), s	3.5	4.4		4.1	3.5	4.4		4.1				
Max Green Setting (Gmax), s	29.5	29.6		18.9	15.8	43.3		55.9				
Max Q Clear Time (g_c+1), s	31.0	32.0		21.0	16.2	34.1		58.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	4.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			169.5									
HCM 2010 LOS			F									

HCM 2010 Signalized Intersection Summary
 12: Cambridge Road & US 50 EB Ramps

Cumulative Plus Project
 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	↶↶	↷	↶	↶	↶↶	↷			
Traffic Volume (veh/h)	330	30	530	460	610	660			
Future Volume (veh/h)	330	30	530	460	610	660			
Number	7	14	5	2	6	16			
Initial Q (Qb), veh	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863			
Adj Flow Rate, veh/h	363	1	662	575	663	0			
Adj No. of Lanes	2	1	1	1	2	1			
Peak Hour Factor	0.91	0.91	0.80	0.80	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	2			
Cap, veh/h	459	211	721	1387	981	439			
Arrive On Green	0.13	0.13	0.41	0.74	0.28	0.00			
Sat Flow, veh/h	3442	1583	1774	1863	3632	1583			
Grp Volume(v), veh/h	363	1	662	575	663	0			
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1863	1770	1583			
Q Serve(g_s), s	6.7	0.0	23.2	7.5	10.9	0.0			
Cycle Q Clear(g_c), s	6.7	0.0	23.2	7.5	10.9	0.0			
Prop In Lane	1.00	1.00	1.00			1.00			
Lane Grp Cap(c), veh/h	459	211	721	1387	981	439			
V/C Ratio(X)	0.79	0.00	0.92	0.41	0.68	0.00			
Avail Cap(c_a), veh/h	473	217	866	1649	1188	532			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	27.5	24.6	18.4	3.1	21.1	0.0			
Incr Delay (d2), s/veh	8.7	0.0	13.0	0.2	1.2	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.7	0.0	13.8	3.8	5.5	0.0			
LnGrp Delay(d),s/veh	36.2	24.6	31.4	3.3	22.2	0.0			
LnGrp LOS	D	C	C	A	C				
Approach Vol, veh/h	364			1237	663				
Approach Delay, s/veh	36.2			18.4	22.2				
Approach LOS	D			B	C				
Timer	1	2	3	4	5	6	7	8	
Assigned Phs		2		4	5	6			
Phs Duration (G+Y+Rc), s		52.8		12.7	30.6	22.2			
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0			
Max Green Setting (Gmax), s		58.0		9.0	32.0	22.0			
Max Q Clear Time (g_c+I1), s		9.5		8.7	25.2	12.9			
Green Ext Time (p_c), s		11.1		0.0	1.5	5.2			
Intersection Summary									
HCM 2010 Ctrl Delay			22.4						
HCM 2010 LOS			C						

Intersection												
Int Delay, s/veh	163											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	↕
Traffic Vol, veh/h	90	10	10	30	10	140	10	710	20	110	450	40
Future Vol, veh/h	90	10	10	30	10	140	10	710	20	110	450	40
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	71	71	71	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	134	15	15	42	14	197	11	747	21	116	474	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1594	1498	478	1503	1488	762	476	0	0	770	0	0
Stage 1	707	707	-	781	781	-	-	-	-	-	-	-
Stage 2	887	791	-	722	707	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 86	122	587	100	124	405	1086	-	-	844	-	-
Stage 1	426	438	-	388	405	-	-	-	-	-	-	-
Stage 2	339	401	-	418	438	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 35	103	585	76	105	404	1084	-	-	843	-	-
Mov Cap-2 Maneuver	~ 35	103	-	76	105	-	-	-	-	-	-	-
Stage 1	418	377	-	380	397	-	-	-	-	-	-	-
Stage 2	164	393	-	337	377	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	\$ 1553.1	164.6	0.1	1.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1084	-	-	41	215	843	-
HCM Lane V/C Ratio	0.01	-	-	4.004	1.179	0.137	-
HCM Control Delay (s)	8.4	0	\$ 1553.1	164.6	9.9	-	-
HCM Lane LOS	A	A	-	F	F	A	-
HCM 95th %tile Q(veh)	0	-	-	18.7	12.5	0.5	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	30	720	10	30	480
Future Vol, veh/h	10	30	720	10	30	480
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	32	758	11	32	505

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1335	767	0	0	770	0
Stage 1	765	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	169	402	-	-	844	-
Stage 1	459	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	160	401	-	-	843	-
Mov Cap-2 Maneuver	160	-	-	-	-	-
Stage 1	458	-	-	-	-	-
Stage 2	535	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	19.5		0		0.6
HCM LOS	C				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 291	843	-
HCM Lane V/C Ratio	-	- 0.145	0.037	-
HCM Control Delay (s)	-	- 19.5	9.4	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 0.5	0.1	-

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
AM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	960	924	96.2%	133.5	23.4	F
	Through	680	695	102.2%	22.5	4.3	C
	Right Turn	40	43	107.0%	3.6	1.0	A
	Subtotal	1,680	1,662	98.9%	83.7	13.0	F
SB	Left Turn	50	49	98.8%	56.7	6.9	E
	Through	1,120	1,144	102.2%	20.8	4.4	C
	Right Turn	550	546	99.3%	8.0	2.2	A
	Subtotal	1,720	1,740	101.1%	17.8	3.5	B
EB	Left Turn	150	145	96.6%	56.2	8.9	E
	Through	60	60	100.0%	58.7	16.3	E
	Right Turn	400	406	101.5%	15.6	24.4	B
	Subtotal	610	611	100.1%	28.2	17.5	C
WB	Left Turn	90	91	101.1%	63.4	7.2	E
	Through	20	20	99.0%	67.0	14.4	E
	Right Turn	40	39	98.3%	6.6	2.2	A
	Subtotal	150	150	100.1%	49.6	5.0	D
Total		4,160	4,162	100.1%	46.8	7.6	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
AM Peak Hour

Intersection 16

Latrobe Rd/US 50 EB Ramps

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	1,490	1,494	100.3%	36.3	31.2	D
	Right Turn	220	234	106.2%	6.6	0.9	A
	Subtotal	1,710	1,728	101.0%	32.0	26.8	C
SB	Left Turn	310	310	100.1%	34.1	2.9	C
	Through	1,300	1,288	99.0%	98.8	46.3	F
	Right Turn						
	Subtotal	1,610	1,598	99.2%	85.7	37.7	F
EB	Left Turn						
	Through						
	Right Turn	1,150	1,165	101.3%	56.2	25.5	E
	Subtotal	1,150	1,165	101.3%	56.2	25.5	E
WB	Left Turn						
	Through						
	Right Turn	190	192	100.9%	0.6	0.2	A
	Subtotal	190	192	100.9%	0.6	0.2	A
Total		4,660	4,682	100.5%	54.1	22.1	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
AM Peak Hour

Intersection 19




















El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	90	94	103.9%	47.7	9.7	D
	Through	710	714	100.6%	8.7	1.9	A
	Right Turn	70	72	102.9%	2.9	0.4	A
	Subtotal	870	880	101.1%	12.0	2.1	B
SB	Left Turn	30	30	99.0%	98.1	18.9	F
	Through	1,550	1,568	101.2%	36.1	9.9	D
	Right Turn	630	639	101.4%	53.2	24.7	D
	Subtotal	2,210	2,237	101.2%	41.7	13.8	D
EB	Left Turn	160	160	99.9%	66.2	6.2	E
	Through	100	101	100.5%	59.5	8.6	E
	Right Turn	40	47	116.5%	7.9	1.5	A
	Subtotal	300	307	102.3%	55.0	5.5	E
WB	Left Turn	130	130	99.7%	43.9	4.1	D
	Through	310	314	101.3%	58.2	7.7	E
	Right Turn	60	62	103.7%	4.8	1.9	A
	Subtotal	500	506	101.2%	47.6	5.1	D
Total		3,880	3,929	101.3%	36.9	7.8	D

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US-50 WB Ramps



















Cumulative Plus Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	740	0	500	0	530	80	0	590	890
Future Volume (veh/h)	0	0	0	740	0	500	0	530	80	0	590	890
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h				779	0	412	0	558	0	0	621	384
Adj No. of Lanes				2	0	1	0	2	1	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	2	2	0	2	2	0	2	2
Cap, veh/h				1207	0	529	0	1628	728	0	1628	708
Arrive On Green				0.34	0.00	0.34	0.00	0.92	0.00	0.00	0.46	0.46
Sat Flow, veh/h				3548	0	1555	0	3632	1583	0	3632	1541
Grp Volume(v), veh/h				779	0	412	0	558	0	0	621	384
Grp Sat Flow(s),veh/h/ln				1774	0	1555	0	1770	1583	0	1770	1541
Q Serve(g_s), s				7.4	0.0	9.5	0.0	0.7	0.0	0.0	4.6	7.2
Cycle Q Clear(g_c), s				7.4	0.0	9.5	0.0	0.7	0.0	0.0	4.6	7.2
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1207	0	529	0	1628	728	0	1628	708
V/C Ratio(X)				0.65	0.00	0.78	0.00	0.34	0.00	0.00	0.38	0.54
Avail Cap(c_a), veh/h				1419	0	622	0	1628	728	0	1628	708
HCM Platoon Ratio				1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	0.99	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				11.2	0.0	11.8	0.0	0.9	0.0	0.0	7.1	7.8
Incr Delay (d2), s/veh				0.8	0.0	5.3	0.0	0.6	0.0	0.0	0.7	3.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.7	0.0	4.8	0.0	0.4	0.0	0.0	2.4	3.6
LnGrp Delay(d),s/veh				11.9	0.0	17.2	0.0	1.5	0.0	0.0	7.8	10.7
LnGrp LOS				B		B		A			A	B
Approach Vol, veh/h					1191			558			1005	
Approach Delay, s/veh					13.8			1.5			8.9	
Approach LOS					B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		22.4				22.4		17.6				
Change Period (Y+Rc), s		4.0				4.0		4.0				
Max Green Setting (Gmax), s		16.0				16.0		16.0				
Max Q Clear Time (g_c+I1), s		2.7				9.2		11.5				
Green Ext Time (p_c), s		7.1				4.4		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay				9.5								
HCM 2010 LOS				A								
Notes												

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US-50 EB Ramps

Cumulative Plus Project Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	0	40	0	0	0	0	470	380	0	1020	310
Future Volume (veh/h)	140	0	40	0	0	0	0	470	380	0	1020	310
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h	147	0	17				0	495	0	0	1074	0
Adj No. of Lanes	2	0	1				0	2	1	0	2	1
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	289	0	133				0	2535	1134	0	2535	1134
Arrive On Green	0.08	0.00	0.08				0.00	0.72	0.00	0.00	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	0	3632	1583
Grp Volume(v), veh/h	147	0	17				0	495	0	0	1074	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	0	1770	1583
Q Serve(g_s), s	1.6	0.0	0.4				0.0	1.8	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.4				0.0	1.8	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	289	0	133				0	2535	1134	0	2535	1134
V/C Ratio(X)	0.51	0.00	0.13				0.00	0.20	0.00	0.00	0.42	0.00
Avail Cap(c_a), veh/h	1377	0	633				0	2535	1134	0	2535	1134
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.86	0.00
Uniform Delay (d), s/veh	17.5	0.0	17.0				0.0	1.9	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.4				0.0	0.2	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.2				0.0	1.0	0.0	0.0	0.2	0.0
LnGrp Delay(d),s/veh	18.9	0.0	17.4				0.0	2.0	0.0	0.0	0.4	0.0
LnGrp LOS	B		B					A			A	
Approach Vol, veh/h		164						495			1074	
Approach Delay, s/veh		18.8						2.0			0.4	
Approach LOS		B						A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		32.6		7.4		32.6						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		16.0		16.0		16.0						
Max Q Clear Time (g_c+I1), s		3.8		3.6		2.0						
Green Ext Time (p_c), s		7.5		0.4		8.2						
Intersection Summary												
HCM 2010 Ctrl Delay			2.6									
HCM 2010 LOS			A									

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
AM Peak Hour

Intersection 21 Latrobe Rd/Town Center Blvd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	70	63	89.6%	34.0	8.0	C
	Through	1,420	1,449	102.0%	16.9	4.3	B
	Right Turn	50	50	100.8%	3.2	1.7	A
	Subtotal	1,540	1,562	101.4%	17.2	4.0	B
SB	Left Turn	470	486	103.4%	56.3	3.9	E
	Through	1,910	1,869	97.9%	56.5	4.1	E
	Right Turn	70	72	103.1%	20.2	7.1	C
	Subtotal	2,450	2,428	99.1%	55.3	3.6	E
EB	Left Turn	10	9	90.0%	65.2	39.0	E
	Through	10	11	107.0%	52.3	21.1	D
	Right Turn	10	12	122.0%	35.2	26.1	D
	Subtotal	30	32	106.3%	51.1	11.8	D
WB	Left Turn	120	121	100.8%	90.8	61.2	F
	Through	30	31	102.0%	89.1	67.2	F
	Right Turn	280	289	103.1%	39.9	40.4	D
	Subtotal	430	440	102.4%	57.0	48.8	E
Total		4,450	4,461	100.3%	41.5	4.6	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement























Marble Valley EIR
Cumulative Plus Project Conditions
AM Peak Hour

Intersection 22 Latrobe Rd/White Rock Rd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	160	134	83.6%	264.9	101.5	F
	Through	1,110	1,123	101.2%	29.7	0.8	C
	Right Turn	230	233	101.1%	10.2	3.5	B
	Subtotal	1,500	1,490	99.3%	48.0	9.5	D
SB	Left Turn	120	122	101.3%	55.4	6.0	E
	Through	1,090	1,092	100.2%	22.0	2.8	C
	Right Turn	830	777	93.6%	108.1	5.5	F
	Subtotal	2,040	1,991	97.6%	58.1	2.7	E
EB	Left Turn	250	261	104.4%	103.5	33.3	F
	Through	170	170	100.1%	45.1	3.6	D
	Right Turn	110	116	105.5%	27.6	4.1	C
	Subtotal	530	547	103.2%	69.7	17.7	E
WB	Left Turn	350	339	96.7%	237.7	50.6	F
	Through	580	594	102.4%	62.4	10.0	E
	Right Turn	180	180	100.2%	4.7	1.0	A
	Subtotal	1,110	1,113	100.3%	105.7	18.9	F
Total		5,180	5,141	99.2%	66.8	5.5	E

HCM 2010 Signalized Intersection Summary
 1: Bass Lake Road & Serrano Parkway

Cumulative Plus Project
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	90	10	10	270	210	10	10	10	630	10	180
Future Volume (veh/h)	230	90	10	10	270	210	10	10	10	630	10	180
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1810	1810	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	240	94	3	11	287	44	11	11	0	685	11	72
Adj No. of Lanes	1	1	1	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.92	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	624	544	19	363	307	80	84	0	741	89	584
Arrive On Green	0.16	0.34	0.34	0.01	0.19	0.19	0.05	0.05	0.00	0.42	0.42	0.42
Sat Flow, veh/h	1723	1810	1579	1774	1863	1575	1774	1863	0	1774	214	1398
Grp Volume(v), veh/h	240	94	3	11	287	44	11	11	0	685	0	83
Grp Sat Flow(s),veh/h/ln	1723	1810	1579	1774	1863	1575	1774	1863	0	1774	0	1612
Q Serve(g_s), s	12.0	3.2	0.1	0.5	12.9	2.0	0.5	0.5	0.0	32.3	0.0	2.8
Cycle Q Clear(g_c), s	12.0	3.2	0.1	0.5	12.9	2.0	0.5	0.5	0.0	32.3	0.0	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.87
Lane Grp Cap(c), veh/h	277	624	544	19	363	307	80	84	0	741	0	674
V/C Ratio(X)	0.87	0.15	0.01	0.58	0.79	0.14	0.14	0.13	0.00	0.92	0.00	0.12
Avail Cap(c_a), veh/h	352	861	752	80	591	500	664	697	0	1005	0	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.1	20.0	19.0	43.4	33.8	29.4	40.5	40.4	0.0	24.3	0.0	15.8
Incr Delay (d2), s/veh	16.6	0.1	0.0	24.9	3.9	0.2	0.8	0.7	0.0	11.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	1.6	0.0	0.4	7.0	0.9	0.3	0.3	0.0	18.1	0.0	1.3
LnGrp Delay(d),s/veh	52.7	20.1	19.0	68.3	37.7	29.6	41.2	41.1	0.0	35.5	0.0	15.8
LnGrp LOS	D	C	B	E	D	C	D	D		D		B
Approach Vol, veh/h		337			342			22				768
Approach Delay, s/veh		43.3			37.7			41.2				33.4
Approach LOS		D			D			D				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	34.4		40.9	18.2	21.2		8.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	42.0		50.0	18.0	28.0		33.0				
Max Q Clear Time (g_c+I1), s	2.5	5.2		34.3	14.0	14.9		2.5				
Green Ext Time (p_c), s	0.0	2.2		2.6	0.2	1.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.8									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
 2: Bass Lake Road & Driveway/Hollow Oak Drive

Cumulative Plus Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	0	0	0	100	0	50	0	640	190	60	600	0
Future Volume (veh/h)	0	0	0	100	0	50	0	640	190	60	600	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1810	1810	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	133	0	0	0	667	191	62	619	0
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.96	0.96	0.96	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	2	2	2
Cap, veh/h	0	4	0	187	0	0	3	835	239	81	1378	0
Arrive On Green	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.62	0.62	0.05	0.74	0.00
Sat Flow, veh/h	0	1863	0	1764	0	0	1723	1353	387	1774	1863	0
Grp Volume(v), veh/h	0	0	0	133	0	0	0	0	858	62	619	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1764	0	0	1723	0	1740	1774	1863	0
Q Serve(g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	19.3	1.8	6.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	19.3	1.8	6.7	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.22	1.00		0.00
Lane Grp Cap(c), veh/h	0	4	0	187	0	0	3	0	1074	81	1378	0
V/C Ratio(X)	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.80	0.77	0.45	0.00
Avail Cap(c_a), veh/h	0	609	0	577	0	0	133	0	1541	137	1649	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.5	0.0	0.0	0.0	0.0	7.5	24.5	2.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	2.0	14.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	9.6	1.2	3.4	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	27.3	0.0	0.0	0.0	0.0	9.5	38.6	2.9	0.0
LnGrp LOS				C					A	D	A	
Approach Vol, veh/h		0		133				858			681	
Approach Delay, s/veh		0.0		27.3				9.5			6.1	
Approach LOS				C				A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	36.1		0.0	0.0	42.4		9.5				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	46.0		17.0	4.0	46.0		17.0				
Max Q Clear Time (g_c+1/3), s	4.0	21.3		0.0	0.0	8.7		5.8				
Green Ext Time (p_c), s	0.0	10.7		0.0	0.0	12.5		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				9.5								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary
 4: Bass Lake Road & Country Club Drive

Cumulative Plus Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	190	280	160	10	70	100	740	180	50	660	20
Future Volume (veh/h)	90	190	280	160	10	70	100	740	180	50	660	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1827	1827	1863	1863	1900
Adj Flow Rate, veh/h	95	200	246	168	11	20	105	779	98	53	695	19
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	4	2	2	2
Cap, veh/h	120	195	240	201	179	325	132	804	682	67	1421	39
Arrive On Green	0.07	0.26	0.26	0.11	0.30	0.30	0.07	0.44	0.44	0.04	0.40	0.40
Sat Flow, veh/h	1774	761	936	1774	593	1077	1774	1827	1549	1774	3519	96
Grp Volume(v), veh/h	95	0	446	168	0	31	105	779	98	53	349	365
Grp Sat Flow(s),veh/h/ln	1774	0	1698	1774	0	1670	1774	1827	1549	1774	1770	1845
Q Serve(g_s), s	5.6	0.0	27.0	9.8	0.0	1.4	6.1	43.8	4.0	3.1	15.4	15.5
Cycle Q Clear(g_c), s	5.6	0.0	27.0	9.8	0.0	1.4	6.1	43.8	4.0	3.1	15.4	15.5
Prop In Lane	1.00		0.55	1.00		0.65	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	120	0	435	201	0	504	132	804	682	67	715	745
V/C Ratio(X)	0.79	0.00	1.02	0.84	0.00	0.06	0.80	0.97	0.14	0.79	0.49	0.49
Avail Cap(c_a), veh/h	202	0	435	270	0	504	219	816	692	67	715	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	0.0	39.1	45.7	0.0	26.1	47.9	28.7	17.6	50.2	23.3	23.3
Incr Delay (d2), s/veh	10.8	0.0	49.5	15.5	0.0	0.1	10.3	23.8	0.1	44.6	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	18.6	5.7	0.0	0.6	3.4	27.4	1.7	2.4	7.7	8.0
LnGrp Delay(d),s/veh	59.1	0.0	88.7	61.2	0.0	26.2	58.2	52.6	17.7	94.9	23.8	23.8
LnGrp LOS	E		F	E		C	E	D	B	F	C	C
Approach Vol, veh/h		541			199			982			767	
Approach Delay, s/veh		83.5			55.7			49.7			28.7	
Approach LOS		F			E			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	50.4	15.9	31.0	11.8	46.5	11.1	35.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	47.0	16.0	27.0	13.0	38.0	12.0	31.0				
Max Q Clear Time (g_c+1/3), s	4.0	45.8	11.8	29.0	8.1	17.5	7.6	3.4				
Green Ext Time (p_c), s	0.0	0.6	0.2	0.0	0.1	10.2	0.1	3.4				
Intersection Summary												
HCM 2010 Ctrl Delay			51.1									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
 5: Bass Lake Road & US 50 WB Ramps

Cumulative Plus Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↕		↕			↕	↕
Traffic Volume (veh/h)	0	0	0	120	10	390	710	640	0	0	640	450
Future Volume (veh/h)	0	0	0	120	10	390	710	640	0	0	640	450
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1827	1827	1900	1845	0	0	1863	1863
Adj Flow Rate, veh/h				126	11	0	740	667	0	0	667	0
Adj No. of Lanes				0	1	1	0	2	0	0	1	1
Peak Hour Factor				0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				4	4	4	3	3	0	0	2	2
Cap, veh/h				181	16	175	0	2678	0	0	1423	1210
Arrive On Green				0.11	0.11	0.00	0.00	1.00	0.00	0.00	0.76	0.00
Sat Flow, veh/h				1606	140	1553	0	3597	0	0	1863	1583
Grp Volume(v), veh/h				137	0	0	0	667	0	0	667	0
Grp Sat Flow(s),veh/h/ln				1747	0	1553	0	1752	0	0	1863	1583
Q Serve(g_s), s				4.9	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0
Cycle Q Clear(g_c), s				4.9	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0
Prop In Lane				0.92		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				197	0	175	0	2678	0	0	1423	1210
V/C Ratio(X)				0.70	0.00	0.00	0.00	0.25	0.00	0.00	0.47	0.00
Avail Cap(c_a), veh/h				752	0	669	0	2678	0	0	1423	1210
HCM Platoon Ratio				1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.78	0.00
Uniform Delay (d), s/veh				27.8	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh				4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.6	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0
LnGrp Delay(d),s/veh				32.1	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0
LnGrp LOS				C				A			A	
Approach Vol, veh/h					137			667			667	
Approach Delay, s/veh					32.1			0.0			3.7	
Approach LOS					C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		53.7			0.0	53.7		11.3				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		29.0			4.0	21.0		28.0				
Max Q Clear Time (g_c+I1), s		2.0			0.0	10.6		6.9				
Green Ext Time (p_c), s		10.1			0.0	6.0		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				4.7								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary
 6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps

Cumulative Plus Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	10	1000	0	0	0	0	890	10	350	410	0
Future Volume (veh/h)	460	10	1000	0	0	0	0	890	10	350	410	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900				0	1827	1900	1900	1863	0
Adj Flow Rate, veh/h	484	11	510				0	937	10	368	432	0
Adj No. of Lanes	1	1	0				0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	2	2	0
Cap, veh/h	375	7	328				0	666	7	271	318	0
Arrive On Green	0.22	0.22	0.22				0.00	0.37	0.37	0.65	0.65	0.00
Sat Flow, veh/h	1740	33	1521				0	1804	19	838	983	0
Grp Volume(v), veh/h	484	0	521				0	0	947	800	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1554				0	0	1823	1821	0	0
Q Serve(g_s), s	28.0	0.0	28.0				0.0	0.0	48.0	42.0	0.0	0.0
Cycle Q Clear(g_c), s	28.0	0.0	28.0				0.0	0.0	48.0	42.0	0.0	0.0
Prop In Lane	1.00		0.98				0.00		0.01	0.46		0.00
Lane Grp Cap(c), veh/h	375	0	335				0	0	673	588	0	0
V/C Ratio(X)	1.29	0.00	1.56				0.00	0.00	1.41	1.36	0.00	0.00
Avail Cap(c_a), veh/h	375	0	335				0	0	673	588	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.00	1.00	0.82	0.00	0.00
Uniform Delay (d), s/veh	51.0	0.0	51.0				0.0	0.0	41.0	23.0	0.0	0.0
Incr Delay (d2), s/veh	149.8	0.0	264.9				0.0	0.0	191.8	171.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.0	0.0	36.6				0.0	0.0	60.0	48.5	0.0	0.0
LnGrp Delay(d),s/veh	200.8	0.0	315.9				0.0	0.0	232.8	194.0	0.0	0.0
LnGrp LOS	F		F						F	F		
Approach Vol, veh/h		1005						947			800	
Approach Delay, s/veh		260.5						232.8			194.0	
Approach LOS		F						F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		52.0		32.0		46.0						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		48.0		28.0		42.0						
Max Q Clear Time (g_c+I1), s		50.0		30.0		44.0						
Green Ext Time (p_c), s		0.0		0.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			231.6									
HCM 2010 LOS			F									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		4↑		↑↓	
Traffic Vol, veh/h	10	10	10	890	1370	30
Future Vol, veh/h	10	10	10	890	1370	30
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	12	12	8	8
Mvmt Flow	11	11	11	937	1442	32
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1951	741	1476	0	-	0
Stage 1	1460	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.34	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.32	-	-	-
Pot Cap-1 Maneuver	56	359	406	-	-	-
Stage 1	180	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	53	358	405	-	-	-
Mov Cap-2 Maneuver	53	-	-	-	-	-
Stage 1	180	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	55.4		0.6		0	
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	405	-	92	-	-	
HCM Lane V/C Ratio	0.026	-	0.229	-	-	
HCM Control Delay (s)	14.1	0.4	55.4	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-	

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Traffic Vol, veh/h	1370	10	10	890	10	10
Future Vol, veh/h	1370	10	10	890	10	10
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1442	11	11	937	11	11

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	1455	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	2.22	-
Pot Cap-1 Maneuver	-	-	461	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	460	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	54
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	94	-	-	460	-
HCM Lane V/C Ratio	0.224	-	-	0.023	-
HCM Control Delay (s)	54	-	-	13	0.3
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	163.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	230	40	20	0	30	70	10	0	20	480	70
Future Vol, veh/h	0	230	40	20	0	30	70	10	0	20	480	70
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.81	0.81	0.81	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	267	47	23	0	37	86	12	0	21	505	74
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	35.5	19.2	139
HCM LOS	E	C	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	79%	27%	1%
Vol Thru, %	84%	14%	64%	78%
Vol Right, %	12%	7%	9%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	570	290	110	670
LT Vol	20	230	30	10
Through Vol	480	40	70	520
RT Vol	70	20	10	140
Lane Flow Rate	600	337	136	761
Geometry Grp	1	1	1	1
Degree of Util (X)	1.207	0.747	0.335	1.519
Departure Headway (Hd)	8.16	9.401	10.833	7.621
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	450	388	334	487
Service Time	6.16	7.401	8.833	5.621
HCM Lane V/C Ratio	1.333	0.869	0.407	1.563
HCM Control Delay	139	35.5	19.2	264.7
HCM Lane LOS	F	E	C	F
HCM 95th-tile Q	20.9	5.9	1.4	37.8

Intersection


















Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	10	520	140
Future Vol, veh/h	0	10	520	140
Peak Hour Factor	0.92	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	11	591	159
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	264.7
HCM LOS	F

HCM Unsignalized Intersection Capacity Analysis
 10: Cambridge Road & Knollwood Drive

Cumulative Plus Project
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	60	330	370	90	90	480	500	340	70	550	10
Future Volume (Veh/h)	10	60	330	370	90	90	480	500	340	70	550	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.90	0.90	0.90	0.91	0.91	0.91
Hourly flow rate (vph)	11	65	359	493	120	120	533	556	378	77	604	11
Pedestrians		2			2			2			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								452				
pX, platoon unblocked	0.76	0.76		0.76	0.76	0.76				0.76		
vC, conflicting volume	2570	2768	614	2970	2584	749	617			936		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2911	3172	614	3439	2930	509	617			756		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	27	0	0	72	45			88		
cM capacity (veh/h)	0	3	491	0	4	426	961			647		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	435	733	533	934	692							
Volume Left	11	493	533	0	77							
Volume Right	359	120	0	378	11							
cSH	0	0	961	1700	647							
Volume to Capacity	Err	Err	0.55	0.55	0.12							
Queue Length 95th (ft)	Err	Err	88	0	10							
Control Delay (s)	Err	Err	13.3	0.0	3.1							
Lane LOS	F	F	B		A							
Approach Delay (s)	Err	Err	4.8		3.1							
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			148.9%		ICU Level of Service					H		
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary
 11: Cambridge Road & Merrychase Drive/US 50 WB Ramps

Cumulative Plus Project
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↗	↖	↗	
Traffic Volume (veh/h)	70	80	180	600	210	530	160	840	50	430	870	70
Future Volume (veh/h)	70	80	180	600	210	530	160	840	50	430	870	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	80	91	0	674	236	549	176	923	0	478	967	74
Adj No. of Lanes	0	1	1	0	1	2	1	2	1	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	61	69	113	513	180	1598	180	834	373	342	1090	83
Arrive On Green	0.07	0.07	0.00	0.39	0.39	0.38	0.10	0.24	0.00	0.19	0.33	0.32
Sat Flow, veh/h	852	969	1583	1330	466	2779	1774	3539	1583	1774	3332	255
Grp Volume(v), veh/h	171	0	0	910	0	549	176	923	0	478	514	527
Grp Sat Flow(s),veh/h/ln	1820	0	1583	1796	0	1390	1774	1770	1583	1774	1770	1817
Q Serve(g_s), s	10.0	0.0	0.0	54.0	0.0	14.7	13.9	33.0	0.0	27.0	38.5	38.5
Cycle Q Clear(g_c), s	10.0	0.0	0.0	54.0	0.0	14.7	13.9	33.0	0.0	27.0	38.5	38.5
Prop In Lane	0.47		1.00	0.74		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	130	0	113	693	0	1598	180	834	373	342	579	594
V/C Ratio(X)	1.32	0.00	0.00	1.31	0.00	0.34	0.98	1.11	0.00	1.40	0.89	0.89
Avail Cap(c_a), veh/h	130	0	113	693	0	1598	180	834	373	342	579	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.0	0.0	0.0	43.0	0.0	15.8	62.7	53.5	0.0	56.5	44.7	44.7
Incr Delay (d2), s/veh	185.9	0.0	0.0	151.2	0.0	0.0	60.3	64.5	0.0	195.6	15.0	14.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	55.9	0.0	5.6	9.8	23.6	0.0	31.8	21.2	21.8
LnGrp Delay(d),s/veh	250.9	0.0	0.0	194.2	0.0	15.9	123.0	118.0	0.0	252.1	59.6	59.3
LnGrp LOS	F			F		B	F	F		F	E	E
Approach Vol, veh/h		171			1459			1099			1519	
Approach Delay, s/veh		250.9			127.1			118.8			120.1	
Approach LOS		F			F			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.0	37.0		14.0	18.2	49.8		58.0				
Change Period (Y+Rc), s	3.5	4.4		4.1	3.5	4.4		4.1				
Max Green Setting (Gmax), s	27.5	32.6		9.9	14.7	45.4		53.9				
Max Q Clear Time (g_c+29.0), s	29.0	35.0		12.0	15.9	40.5		56.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	3.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			127.4									
HCM 2010 LOS			F									

HCM 2010 Signalized Intersection Summary
 12: Cambridge Road & US 50 EB Ramps

Cumulative Plus Project
 PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	680	90	480	370	970	680		
Future Volume (veh/h)	680	90	480	370	970	680		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	739	26	522	402	1054	0		
Adj No. of Lanes	2	1	1	1	2	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	740	340	508	1249	1156	517		
Arrive On Green	0.21	0.21	0.29	0.67	0.33	0.00		
Sat Flow, veh/h	3442	1583	1774	1863	3632	1583		
Grp Volume(v), veh/h	739	26	522	402	1054	0		
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1863	1770	1583		
Q Serve(g_s), s	15.0	0.9	20.0	6.3	19.9	0.0		
Cycle Q Clear(g_c), s	15.0	0.9	20.0	6.3	19.9	0.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	740	340	508	1249	1156	517		
V/C Ratio(X)	1.00	0.08	1.03	0.32	0.91	0.00		
Avail Cap(c_a), veh/h	740	340	508	1255	1166	522		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	27.4	21.9	24.9	4.8	22.5	0.0		
Incr Delay (d2), s/veh	32.8	0.1	46.9	0.1	10.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/lt	0.4	0.9	16.2	3.3	11.4	0.0		
LnGrp Delay(d),s/veh	60.2	22.0	71.8	5.0	33.3	0.0		
LnGrp LOS	E	C	F	A	C			
Approach Vol, veh/h	765			924	1054			
Approach Delay, s/veh	58.9			42.7	33.3			
Approach LOS	E			D	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		50.8		19.0	24.0	26.8		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		47.0		15.0	20.0	23.0		
Max Q Clear Time (g_c+I1), s		8.3		17.0	22.0	21.9		
Green Ext Time (p_c), s		13.5		0.0	0.0	0.9		
Intersection Summary								
HCM 2010 Ctrl Delay			43.6					
HCM 2010 LOS			D					

Intersection

Int Delay, s/veh 187.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	↕
Traffic Vol, veh/h	70	10	10	20	10	150	10	640	20	190	760	110
Future Vol, veh/h	70	10	10	20	10	150	10	640	20	190	760	110
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	71	71	71	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	89	13	13	28	14	211	11	674	21	200	800	116

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2022	1920	804	1922	1909	688	802	0	0	697	0	0
Stage 1	1202	1202	-	707	707	-	-	-	-	-	-	-
Stage 2	820	718	-	1215	1202	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 43	67	383	51	68	446	822	-	-	899	-	-
Stage 1	225	258	-	426	438	-	-	-	-	-	-	-
Stage 2	369	433	-	222	258	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 15	51	382	33	52	445	821	-	-	898	-	-
Mov Cap-2 Maneuver	~ 15	51	-	33	52	-	-	-	-	-	-	-
Stage 1	220	200	-	416	428	-	-	-	-	-	-	-
Stage 2	183	423	-	156	200	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	\$ 2820.9	\$ 346.2	0.1	1.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	821	-	-	18	159	898	-	-
HCM Lane V/C Ratio	0.013	-	-	6.329	1.594	0.223	-	-
HCM Control Delay (s)	9.4	0	\$ 2820.9	\$ 346.2	10.2	-	-	-
HCM Lane LOS	A	A	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	14.9	17.3	0.9	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	40	660	10	30	780
Future Vol, veh/h	10	40	660	10	30	780
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	42	695	11	32	821

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1588	704	0	0	707	0
Stage 1	702	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	119	437	-	-	891	-
Stage 1	491	-	-	-	-	-
Stage 2	403	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	111	436	-	-	890	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	376	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	21.2		0		0.3
HCM LOS	C				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 275	890	-
HCM Lane V/C Ratio	-	- 0.191	0.035	-
HCM Control Delay (s)	-	- 21.2	9.2	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 0.7	0.1	-

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
PM Peak Hour

Intersection 15

El Dorado Hills Blvd/US 50 WB Ramps-Saratoga Wy

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	1,180	1,121	95.0%	106.7	15.5	F
	Through	1,530	1,497	97.8%	30.4	4.7	C
	Right Turn	190	187	98.6%	5.8	1.1	A
	Subtotal	2,900	2,806	96.7%	60.0	5.4	E
SB	Left Turn	40	40	100.3%	56.9	10.9	E
	Through	1,130	1,129	99.9%	41.5	6.4	D
	Right Turn	270	268	99.1%	6.5	1.4	A
	Subtotal	1,440	1,437	99.8%	35.5	5.1	D
EB	Left Turn	215	210	97.5%	60.7	5.5	E
	Through	40	41	103.0%	62.1	9.6	E
	Right Turn	290	291	100.3%	3.6	0.3	A
	Subtotal	545	542	99.4%	29.1	3.1	C
WB	Left Turn	130	119	91.2%	59.0	9.5	E
	Through	60	61	100.8%	65.1	11.8	E
	Right Turn	80	85	106.4%	18.7	3.7	B
	Subtotal	270	264	97.8%	47.6	5.2	D
Total		5,155	5,048	97.9%	49.1	3.9	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement




















Marble Valley EIR
Cumulative Plus Project Conditions
PM Peak Hour

Intersection 16 Latrobe Rd/US 50 EB Ramps Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn						
	Through	2,180	2,115	97.0%	20.0	18.8	C
	Right Turn	440	412	93.7%	10.8	0.8	B
	Subtotal	2,620	2,527	96.4%	18.5	15.8	B
SB	Left Turn	180	179	99.2%	28.1	4.3	C
	Through	1,370	1,351	98.6%	19.2	4.8	B
	Right Turn						
	Subtotal	1,550	1,530	98.7%	20.1	4.5	C
EB	Left Turn						
	Through						
	Right Turn	700	695	99.2%	25.9	3.4	C
	Subtotal	700	695	99.2%	25.9	3.4	C
WB	Left Turn						
	Through						
	Right Turn	720	716	99.5%	1.8	0.3	A
	Subtotal	720	716	99.5%	1.8	0.3	A
Total		5,590	5,468	97.8%	17.7	7.4	B

HCM 2010 Signalized Intersection Summary
 17: Silva Valley Pkwy & US-50 WB Ramps






















Cumulative Plus Project Conditions
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	790	0	580	0	1060	80	0	410	240
Future Volume (veh/h)	0	0	0	790	0	580	0	1060	80	0	410	240
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00	1.00		0.97
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h				832	0	594	0	1116	0	0	432	102
Adj No. of Lanes				2	0	1	0	2	1	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	2	2	0	2	2	0	2	2
Cap, veh/h				1501	0	659	0	1570	702	0	1570	683
Arrive On Green				0.42	0.00	0.42	0.00	0.15	0.00	0.00	0.44	0.44
Sat Flow, veh/h				3548	0	1557	0	3632	1583	0	3632	1540
Grp Volume(v), veh/h				832	0	594	0	1116	0	0	432	102
Grp Sat Flow(s),veh/h/ln				1774	0	1557	0	1770	1583	0	1770	1540
Q Serve(g_s), s				10.6	0.0	21.3	0.0	18.0	0.0	0.0	4.6	2.4
Cycle Q Clear(g_c), s				10.6	0.0	21.3	0.0	18.0	0.0	0.0	4.6	2.4
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1501	0	659	0	1570	702	0	1570	683
V/C Ratio(X)				0.55	0.00	0.90	0.00	0.71	0.00	0.00	0.28	0.15
Avail Cap(c_a), veh/h				1597	0	701	0	1570	702	0	1570	683
HCM Platoon Ratio				1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	0.92	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.0	0.0	16.1	0.0	21.9	0.0	0.0	10.6	9.9
Incr Delay (d2), s/veh				0.4	0.0	14.4	0.0	2.5	0.0	0.0	0.4	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	11.7	0.0	9.4	0.0	0.0	2.3	1.1
LnGrp Delay(d),s/veh				13.4	0.0	30.5	0.0	24.5	0.0	0.0	11.0	10.4
LnGrp LOS				B		C		C			B	B
Approach Vol, veh/h					1426			1116			534	
Approach Delay, s/veh					20.5			24.5			10.9	
Approach LOS					C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		30.6				30.6		29.4				
Change Period (Y+Rc), s		4.0				4.0		4.0				
Max Green Setting (Gmax), s		25.0				25.0		27.0				
Max Q Clear Time (g_c+I1), s		20.0				6.6		23.3				
Green Ext Time (p_c), s		3.7				10.0		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay				20.3								
HCM 2010 LOS				C								
Notes												

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
 18: Silva Valley Pkwy & US-50 EB Ramps

Cumulative Plus Project Conditions
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							 			 	
Traffic Volume (veh/h)	320	0	80	0	0	0	0	820	590	0	1020	180
Future Volume (veh/h)	320	0	80	0	0	0	0	820	590	0	1020	180
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	0	1863	1863
Adj Flow Rate, veh/h	337	0	12				0	863	0	0	1074	0
Adj No. of Lanes	2	0	1				0	2	1	0	2	1
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	484	0	223				0	2570	1150	0	2570	1150
Arrive On Green	0.14	0.00	0.14				0.00	0.73	0.00	0.00	0.24	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	0	3632	1583
Grp Volume(v), veh/h	337	0	12				0	863	0	0	1074	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	0	1770	1583
Q Serve(g_s), s	5.6	0.0	0.4				0.0	5.3	0.0	0.0	15.4	0.0
Cycle Q Clear(g_c), s	5.6	0.0	0.4				0.0	5.3	0.0	0.0	15.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	484	0	223				0	2570	1150	0	2570	1150
V/C Ratio(X)	0.70	0.00	0.05				0.00	0.34	0.00	0.00	0.42	0.00
Avail Cap(c_a), veh/h	1032	0	475				0	2570	1150	0	2570	1150
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.91	0.00
Uniform Delay (d), s/veh	24.6	0.0	22.3				0.0	3.0	0.0	0.0	12.1	0.0
Incr Delay (d2), s/veh	1.8	0.0	0.1				0.0	0.4	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.2				0.0	2.6	0.0	0.0	7.7	0.0
LnGrp Delay(d),s/veh	26.4	0.0	22.4				0.0	3.3	0.0	0.0	12.6	0.0
LnGrp LOS	C		C					A			B	
Approach Vol, veh/h		349						863			1074	
Approach Delay, s/veh		26.2						3.3			12.6	
Approach LOS		C						A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		47.6		12.4		47.6						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		34.0		18.0		34.0						
Max Q Clear Time (g_c+I1), s		7.3		7.6		17.4						
Green Ext Time (p_c), s		15.2		0.9		11.1						
Intersection Summary												
HCM 2010 Ctrl Delay			11.2									
HCM 2010 LOS			B									

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
PM Peak Hour

Intersection 19

El Dorado Hills Blvd/Saratoga Wy-Park Dr

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	40	40	100.0%	74.7	12.5	E
	Through	1,610	1,586	98.5%	52.9	6.0	D
	Right Turn	170	172	101.1%	8.5	1.8	A
	Subtotal	1,820	1,798	98.8%	49.6	5.5	D
SB	Left Turn	110	112	101.4%	69.9	14.0	E
	Through	910	909	99.8%	26.2	3.8	C
	Right Turn	190	198	104.2%	6.6	1.3	A
	Subtotal	1,210	1,218	100.7%	27.0	4.1	C
EB	Left Turn	600	588	98.1%	128.0	31.3	F
	Through	190	190	100.1%	45.9	6.7	D
	Right Turn	420	413	98.4%	17.8	2.9	B
	Subtotal	1,210	1,192	98.5%	77.3	17.1	E
WB	Left Turn	110	112	102.0%	64.5	9.6	E
	Through	170	171	100.5%	58.7	9.4	E
	Right Turn	200	192	96.0%	17.8	3.4	B
	Subtotal	480	475	99.0%	43.3	5.3	D
Total		4,720	4,682	99.2%	50.1	5.2	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
PM Peak Hour

Intersection 21 Latrobe Rd/Town Center Blvd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	11	105.0%	152.2	33.9	F
	Through	1,780	1,713	96.2%	139.9	7.5	F
	Right Turn	40	37	92.8%	6.8	3.0	A
	Subtotal	1,830	1,761	96.2%	138.1	7.4	F
SB	Left Turn	510	495	97.1%	101.0	29.5	F
	Through	1,550	1,541	99.4%	22.2	5.6	C
	Right Turn	10	12	115.0%	1.8	1.8	A
	Subtotal	2,070	2,047	98.9%	41.7	11.2	D
EB	Left Turn	190	185	97.2%	51.2	6.9	D
	Through	30	28	94.7%	53.5	18.6	D
	Right Turn	90	93	103.1%	27.7	6.9	C
	Subtotal	310	306	98.7%	44.1	5.8	D
WB	Left Turn	60	60	99.8%	75.5	27.2	E
	Through	10	12	121.0%	64.2	56.0	E
	Right Turn	650	643	99.0%	35.7	25.3	D
	Subtotal	720	715	99.3%	39.6	26.1	D
Total		4,930	4,829	98.0%	76.4	8.3	E

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Cumulative Plus Project Conditions
PM Peak Hour

Intersection 22 Latrobe Rd/White Rock Rd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	160	163	101.8%	156.3	86.7	F
	Through	890	859	96.5%	196.7	120.1	F
	Right Turn	410	378	92.2%	151.2	103.0	F
	Subtotal	1,460	1,400	95.9%	180.8	112.9	F
SB	Left Turn	260	258	99.4%	56.8	22.8	E
	Through	980	984	100.4%	24.9	1.7	C
	Right Turn	460	461	100.1%	14.3	2.7	B
	Subtotal	1,700	1,703	100.2%	27.5	4.1	C
EB	Left Turn	730	736	100.8%	95.3	47.4	F
	Through	560	568	101.4%	46.7	3.5	D
	Right Turn	240	230	96.0%	40.7	9.2	D
	Subtotal	1,530	1,534	100.3%	68.7	22.5	E
WB	Left Turn	290	293	100.9%	74.8	19.5	E
	Through	410	410	100.1%	69.4	18.8	E
	Right Turn	210	209	99.6%	7.2	2.4	A
	Subtotal	910	912	100.2%	57.3	16.7	E
Total		5,600	5,549	99.1%	79.6	27.9	E

Cumulative No Project Roadway Segments Analysis		Note: County Website Counts are the average of the T		Peak Hour Volume		LOS Thresholds			V/ C Ratio		LOS	
Marble Valley EIR		Count Source	Number of Lanes	AM	PM	LOS C	LOS D	LOS E	AM	PM	AM	PM
Bass Lake Rd - Green Valley Rd to US 50 (2 segments) - 4 extra												
	Green Valley Rd to Bridlewood Dr	County Website	2A	770	820	850	1540	1650	0.47	0.50	C or better	C or better
	Bridlewood Dr to Serrano Pkwy	Intersection Counts	2A	1070	1150	850	1540	1650	0.65	0.70	D	D
	Serrano Pkwy to Hollow Oak Dr	Intersection Counts	2A	1010	880	850	1540	1650	0.61	0.53	D	D
	Hollow Oak Dr to Country Club	Intersection Counts	2A	1680	1540	850	1540	1650	1.02	0.93	F	D
	Country Club Dr to US 50	Intersection Counts	4AD	1820	2150	1850	3220	3290	0.55	0.65	C or better	D
Cambridge Rd - Green Valley to US 50 (4 segments)												
	Green Valley Rd to Oxford	County Website	2A	570	660	850	1540	1650	0.35	0.40	C or better	C or better
	Oxford to Knollwood Dr	Intersection Counts	2A	950	1180	850	1540	1650	0.58	0.72	D	D
	Knollwood Dr to Country Club	Intersection Counts	2A	1040	1260	850	1540	1650	0.63	0.76	D	D
	Knollwood Dr to US 50	Intersection Counts	4AD	1960	2170	1850	3220	3290	0.60	0.66	D	D
Cameron Park Dr - Green Valley to US 50 (4 Segments)												
	Green Valley to Alhambra	County Website	2A	850	990	850	1540	1650	0.52	0.60	C or better	D
	Alhambra to Oxford	County Website	2A	1480	1750	850	1540	1650	0.90	1.06	D	F
	Oxford to Hacienda Dr	Roadway Counts	2A	1400	1860	850	1540	1650	0.85	1.13	D	F
	Hacienda Dr to US 50	County Website	4AU	1660	2300	1760	3070	3130	0.53	0.73	C or better	D
Country Club - Bass Lake to Cameron Park Dr (4 Segments)												
	Bass Lake to Merrychase Dr	Intersection Counts	2A	730	720	850	1540	1650	0.44	0.44	C or better	C or better
	Merrychase Dr to Knollwood	County Website	2A	660	700	850	1540	1650	0.40	0.42	C or better	C or better
	Knollwood to Cambridge	Intersection Counts	2A	480	670	850	1540	1650	0.29	0.41	C or better	C or better
	Cambridge to Royal	Intersection Counts	2A	290	310	850	1540	1650	0.18	0.19	C or better	C or better
	Royal to Cameron Park Dr	County Website	2A	230	370	850	1540	1650	0.14	0.22	C or better	C or better
Durock Rd - US 50 to South Shingle (2 Segments)												
	US to to Business Dr	County Website	2A	620	840	850	1540	1650	0.38	0.51	C or better	C or better
	Business Dr to S. Shingle	County Website	2A	550	740	850	1540	1650	0.33	0.45	C or better	C or better

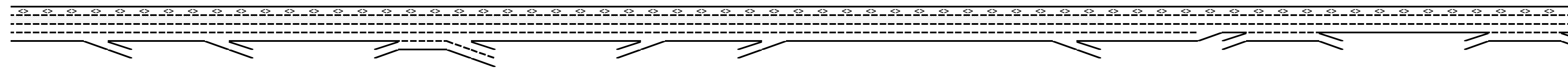
Cumulative Plus Project Roadway Segments Analysis		Note: County Website Counts are the average of the Tu		Peak Hour Volume		LOS Thresholds			V/ C Ratio		LOS	
Marble Valley EIR		Count Source	Number of Lanes	AM	PM	LOS C	LOS D	LOS E	AM	PM	AM	PM
Bass Lake Rd - Green Valley Rd to US 50 (2 segments) - 4 extra												
	Green Valley Rd to Bridlewood Dr	County Website	2A	750	820	850	1540	1650	0.45	0.50	C or better	C or better
	Bridlewood Dr to Serrano Pkwy	Intersection Counts	2A	1070	1180	850	1540	1650	0.65	0.72	D	D
	Serrano Pkwy to Hollow Oak Dr	Intersection Counts	2A	1030	880	850	1540	1650	0.62	0.53	D	D
	Hollow Oak Dr to Country Club	Intersection Counts	2A	1720	1540	850	1540	1650	1.04	0.93	F	D
	Country Club Dr to US 50	Intersection Counts	4AD	2060	2100	1850	3220	3290	0.63	0.64	D	D
Cambridge Rd - Green Valley to US 50 (4 segments)												
	Green Valley Rd to Oxford	County Website	2A	580	680	850	1540	1650	0.35	0.41	C or better	C or better
	Oxford to Knollwood Dr	Intersection Counts	2A	990	1210	850	1540	1650	0.60	0.73	D	D
	Knollwood Dr to Country Club	Intersection Counts	2A	1100	1310	850	1540	1650	0.67	0.79	D	D
	Knollwood Dr to US 50	Intersection Counts	4AD	2220	2500	1850	3220	3290	0.67	0.76	D	D
Cameron Park Dr - Green Valley to US 50 (4 Segments)												
	Green Valley to Alhambra	County Website	2A	830	970	850	1540	1650	0.50	0.59	C or better	D
	Alhambra to Oxford	County Website	2A	1500	1750	850	1540	1650	0.91	1.06	D	F
	Oxford to Hacienda Dr	Roadway Counts	2A	1400	1860	850	1540	1650	0.85	1.13	D	F
	Hacienda Dr to US 50	County Website	4AU	1680	2310	1760	3070	3130	0.54	0.74	C or better	D
Country Club - Bass Lake to Cameron Park Dr (4 Segments)												
	Bass Lake to Merrychase Dr	Intersection Counts	2A	680	630	850	1540	1650	0.41	0.38	C or better	C or better
	Merrychase Dr to Knollwood	County Website	2A	610	600	850	1540	1650	0.37	0.36	C or better	C or better
	Knollwood to Cambridge	Intersection Counts	2A	490	600	850	1540	1650	0.30	0.36	C or better	C or better
	Cambridge to Royal	Intersection Counts	2A	290	310	850	1540	1650	0.18	0.19	C or better	C or better
	Royal to Cameron Park Dr	County Website	2A	230	370	850	1540	1650	0.14	0.22	C or better	C or better
Durock Rd - US 50 to South Shingle (2 Segments)												
	US to to Business Dr	County Website	2A	640	870	850	1540	1650	0.39	0.53	C or better	D
	Business Dr to S. Shingle	County Website	2A	560	760	850	1540	1650	0.34	0.46	C or better	C or better

Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50

Alternative: Cumulative No Project
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

Location	1	2	3	4	5	6	7	8	9	10	11	12	13
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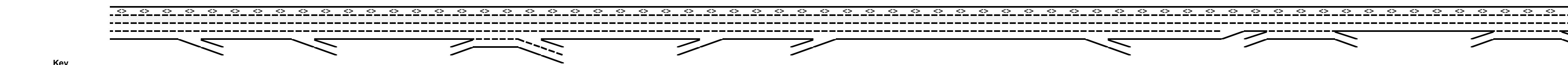
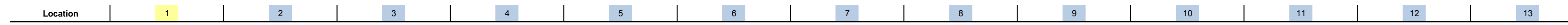


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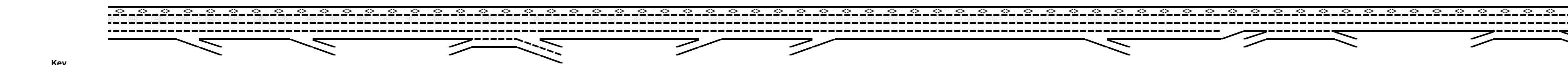
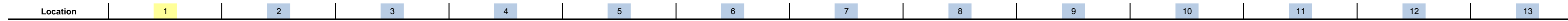
<-> Express Lane (HOV)

No Trucks

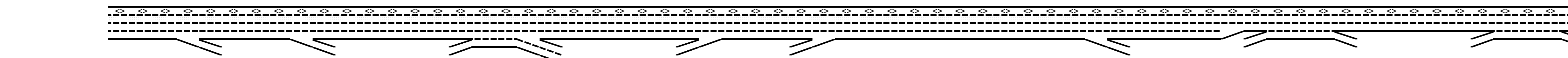
Name	Latrobe Rd off-ramp	Ei Dorado Hills Blvd off-ramp	Ei Dorado Hills Blvd off to on-ramp	Ei Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Define Freeway Segment													
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Merge	Basic	Diverge	Basic	Weave	Basic	Weave
Length (ft)	1,500	850	1,975	3,000	1,575	800	1,500	2,125	1,500	2,100	6,625	1,350	8,250
Accel Length						550	150						
Decel Length	150	150							150				
Mainline Volume	4,080	2,890	2,700	2,700	2,980	2,980	3,300	3,660	3,660	3,130	3,130	3,100	3,100
On Ramp Volume				490		320	360				350		870
Off Ramp Volume	1,190	190		210					530		380		1,060
Express Lane Volume	449	318	297	297	417	417	462	512	512	438	407	403	403
EL On Ramp Volume													
EL Off Ramp Volume													
Calculate Flow Rate in General Purpose Lanes (GP)													
GP Volume (vph)	3,631	2,572	2,403	2,893	2,563	2,883	3,198	3,148	3,148	2,692	3,073	2,697	3,567
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
GP Lanes	3	3	3	4	3	3	3	3	3	3	3	2	3
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	5.0	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.980	0.980	0.980	0.980	0.980	0.980	0.980	0.862	0.980	0.980	0.980	0.980	0.980
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	4,026	2,852	2,664	3,207	2,841	3,196	3,546	3,969	3,490	2,984	3,407	2,990	3,955
GP Flow (pcphpl)	1,342	951	888	802	947	1,065	1,182	1,323	1,163	995	1,136	1,495	1,318
Calculate Speed in General Purpose Lanes													
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes													
v/c ratio	0.57	0.40	0.38	0.34	0.40	0.45	0.50	0.56	0.49	0.42	0.48	0.64	0.56
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.9	65.0
Density (pcphpl)	20.6	14.6	13.7	12.3	14.6	16.4	18.2	20.4	17.9	15.3	17.5	23.0	20.3
LOS	C	B	B	B	B	B	C	C	B	B	B	C	C
Calculate Operations for Entering GP Lanes													
GP _N Vol (pcph)				2,687		2,856	3,163				3,035		2,995
GP _N Cap (pcph)				7,050		7,050	7,050				4,700		4,700
GP _N v/c ratio				0.38		0.41	0.45				0.65		0.64
Calculate Operations for Exiting GP Lanes													
GP _{OUT} Vol (pcph)	2,761	2,650		2,983					2,926	2,984	2,983		2,778
GP _{OUT} Cap (pcph)	7,050	7,050		7,050					7,050	4,700	4,700		4,700
GP _{OUT} v/c ratio	0.39	0.38		0.42					0.42	0.63	0.63		0.59



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Flow Rate in Express Lanes (EL)													
EL Volume (vph)	449	318	297	297	417	417	462	512	512	438	407	403	403
PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990
f _P	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	533	378	353	353	496	496	549	657	609	521	483	479	479
EL Flow (pcphpl)	533	378	353	353	496	496	549	657	609	521	483	479	479
Calculate Speed in Express Lanes													
Lane Width (ft)													
Shoulder Width													
TRD													
f _{LW}													
f _{LC}													
Calc'd FFS													
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes													
EL _N v/c ratio	0.30	0.22	0.20	0.20	0.28	0.28	0.31	0.38	0.35	0.30	0.28	0.27	0.27
Calculate On Ramp Flow Rate													
On Volume (vph)				490		320	360				350		870
PHF				0.95		0.95	0.95				0.95		0.92
Total Lanes				1		1	1				1		1
Terrain				Level		Level	Level				Level		Level
Grade %				0.0%		0.0%	0.0%				0.0%		0.0%
Grade Length (mi)				0.00		0.00	0.00				0.00		0.00
Truck & Bus %				2.0%		2.0%	2.0%				2.0%		3.0%
RV %				0.0%		0.0%	0.0%				0.0%		0.0%
E _T				1.5		1.5	1.5				1.5		1.5
E _R				1.2		1.2	1.2				1.2		1.2
f _{HV}				0.990		0.990	0.990				0.990		0.985
f _P				1.00		1.00	1.00				1.00		1.00
On Flow (pcph)				521		340	383				372		960
On Flow (pcphpl)				521		340	383				372		960
Calculate On Ramp Roadway Operations													
On Ramp Type				Right		Right	Right				Right		Right
On Ramp Speed (mph)				45		25	45				45		25
On Ramp Cap (pcph)				2,100		1,900	2,100				2,100		1,900
On Ramp v/c ratio				0.25		0.18	0.18				0.18		0.51

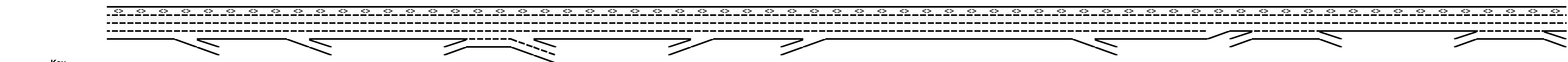
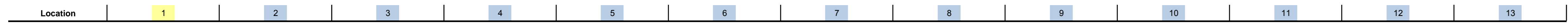


Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Off Ramp Flow Rate													
Off Volume (vph)	1,190	190		210					530		380		1,060
PHF	0.95	0.95		0.95					0.95		0.91		0.91
Total Lanes	1	1		2					1		1		1
Terrain	Level	Level		Level					Level		Level		Level
Grade %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
Grade Length (mi)	0.00	0.00		0.00					0.00		0.00		0.00
Truck & Bus %	2.0%	2.0%		3.0%					2.0%		3.0%		2.0%
RV %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
E _T	1.5	1.5		1.5					1.5		1.5		1.5
E _R	1.2	1.2		1.2					1.2		1.2		1.2
f _{HV}	0.990	0.990		0.985					0.990		0.985		0.990
f _p	1.00	1.00		1.00					1.00		1.00		1.00
Off Flow (pcph)	1,265	202		224					563		424		1,176
Off Flow (pcphpl)	1,265	202		112					563		424		1,176
Calculate Off Ramp Roadway Operations													
Off Ramp Type	Right	Right		Right					Right		Right		Right
Off Ramp Speed	45	25		45					45		45		45
Off Ramp Cap (pcph)	2,100	1,900		4,200					2,100		2,100		2,100
Off Ramp v/c ratio	0.60	0.11		0.05					0.27		0.20		0.56
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps													
Up Type		Off				No	On		No		Off		Off
Up Distance		2,350					800				2,100		1,350
Up Flow (pcph)		1,265					340				563		424
Down Type	Off	On			On	On	On		On		On		No
Down Distance	850	1,975			2,900	1,500	1,500		2,100		1,350		
Down Flow (pcph)	202	521			372	372	372		372		960		
Calculate Merge Influence Area Operations													
Effective v _o (pcph)						2,856	3,163						
Up Ramp L _{EQ}							777						
Down Ramp L _{EQ}						2,209	2,961						
P _{FM} (Eqn 13-3)						0.593	0.582						
P _{FM} (Eqn 13-4)		#VALUE!									#VALUE!		#VALUE!
P _{FM} (Eqn 13-5)	0.611												
P _{FM}						0.593	0.582						
v ₁₂ (pcph)						1,693	1,840						
v ₃ (pcph)						1,163	1,323						
v ₃₄ (pcph)													
v _{12a} (pcph)						1,693	1,840						
v _{R12a} (pcph)						2,033	2,223						
Merge Speed Index						0.32	0.34						
Merge Area Speed						57.6	57.1						
Outer Lanes Volume						1,163	1,323						
Outer Lanes Speed						62.6	62.0						
Segment Speed						59.3	58.8						
Merge v/c ratio						0.44	0.48						
Merge Density						17.7	21.7						
Merge LOS						B	C						



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Diverge Influence Area Operations													
Effective v_p (pcph)	4,026	2,852							3,490				
Up Ramp L_{EQ}		10,435											
Down Ramp L_{EQ}	364	529							448				
P_{FD} (Eqn 13-9)	0.601	0.679							0.647				
P_{FD} (Eqn 13-10)													
P_{FD} (Eqn 13-11)	0.561												
P_{FD}	0.601	0.679							0.647				
v_{12} (pcph)	2,925	2,002							2,456				
v_3 (pcph)	1,101	849							1,033				
v_{34} (pcph)													
v_{12a} (pcph)	2,925	2,002							2,456				
Diverge Speed Index	0.41	0.58							0.35				
Diverge Area Speed	55.5	51.7							57.0				
Outer Lanes Volume	1,101	849							1,033				
Outer Lanes Speed	70.9	71.3							71.2				
Segment Speed	59.0	56.4							60.6				
Diverge v/c ratio	0.66	0.46							0.56				
Diverge Density	28.1	20.1							24.0				
Diverge LOS	D	C							C				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments													
On to Off Volume (vph)				50							10		460
PHF				0.92							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				4.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E_T				1.5							1.5		1.5
E_R				1.2							1.2		1.2
f_{HV}				0.980							0.990		0.985
f_p				1.00							1.00		1.00
On to Off Flow (pcph)				55							11		508
Calculate On Ramp to Mainline Flow Rate for Weave Segments													
On to ML Volume (vph)				440							340		410
PHF				0.95							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				2.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E_T				1.5							1.5		1.5
E_R				1.2							1.2		1.2
f_{HV}				0.990							0.990		0.985
f_p				1.00							1.00		1.00
On to ML Flow (pcph)				468							361		452
Calculate Mainline to Off Ramp Flow Rate for Weave Segments													
ML to Off Volume (vph)				160							370		600
PHF				0.95							0.91		0.91
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				3.0%							3.0%		2.0%
RV %				0.0%							0.0%		0.0%
E_T				1.5							1.5		1.5
E_R				1.2							1.2		1.2
f_{HV}				0.985							0.985		0.990
f_p				1.00							1.00		1.00
ML to Off Flow (pcph)				171							413		666



Key
 <-> Express Lane (HOV)
 No Trucks

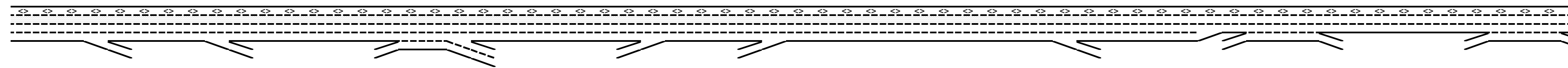
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments													
GP to GP Volume (vph)				2,243							2,353		2,097
PHF				0.92							0.92		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				4.0%							4.0%		4.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.980							0.980		0.980
f _p				1.00							1.00		1.00
GP to GP Flow (pcph)				2,487							2,609		2,325
Calculate Weave Segment Operations													
Weave Type				One-sided							One-sided		One-sided
Weave Length				2,000							5,625		7,250
Segment Lanes				3							2		2
Weave Lanes				2							2		2
Weave Flow (pcph)				639							774		1,118
Non-Weave Flow				2,542							2,620		2,832
Segment Flow				3,181							3,394		3,951
Max Weave Length				4,544							4,826		5,403
Length Check				OK							Not a Weave		Not a Weave
Ideal Weave Capacity				2,155							2,411		2,491
f _{HV}				0.982							0.982		0.983
f _p				0.999							0.999		0.998
Capacity Condition 1				6,341							4,731		4,891
Capacity Condition 2				11,721							10,321		8,322
Weave v/c ratio				0.49							0.70		0.79
Interchange Density				2							2		2
Lane Changes On to ML				1							1		1
Lane Changes ML to Off				0							1		1
Lane Changes On to Off				0							0		0
Min Lane Change Rate				468							774		1,118
Weave LC Rate				1,101							2,903		3,881
Non-Weave LC Rate 1				1,030							3,203		4,128
Non-Weave LC Rate 2				2,256							2,273		2,321
Non-Weave LC Rate 3				496							847		-3,676
Segment LC Rate				2,131							5,176		6,201
Weave Intensity Factor				0.238							0.212		0.200
Weave Speed				55.4							56.3		56.7
Non-Weave Speed				56.5							51.3		47.5
Segment Speed				56.3							52.3		49.8
Weave Density				18.8							-		-
Weave LOS				B							Basic		Basic
Summarize Segment Operations													
Segment v/c ratio	0.66	0.46	0.38	0.49	0.40	0.44	0.48	0.56	0.56	0.42	0.48	0.64	0.56
Segment Density	28.1	20.1	13.7	18.8	14.6	17.7	21.7	20.4	24.0	15.3	17.5	23.0	20.3
Segment LOS	D	C	B	B	B	B	C	C	C	B	B	C	C
Over Capacity													

Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50

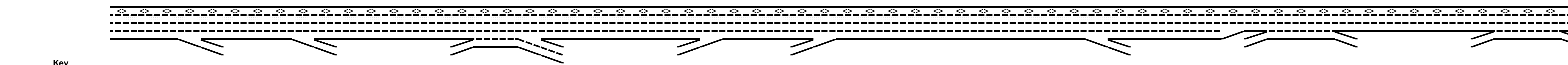
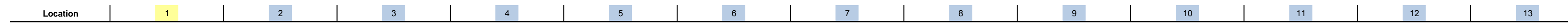
Alternative: Cumulative No Project
Time Period: PM Peak Hour

Data Entry Value
Calculated Value

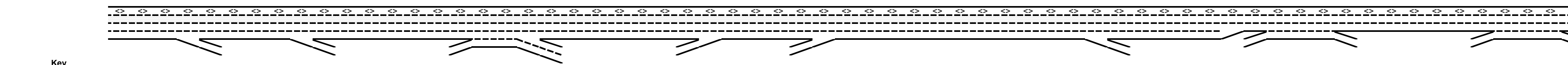
Location	1	2	3	4	5	6	7	8	9	10	11	12	13
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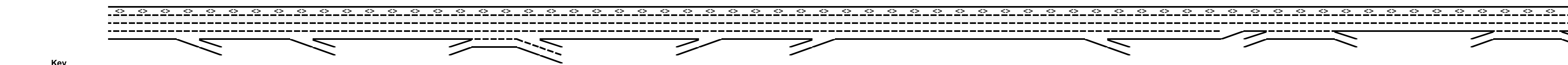
Name	Latrobe Rd off-ramp	Ei Dorado Hills Blvd off-ramp	Ei Dorado Hills Blvd off to on-ramp	Ei Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Define Freeway Segment													
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Merge	Basic	Diverge	Basic	Weave	Basic	Weave
Length (ft)	1,500	850	1,975	3,000	1,575	800	1,500	2,125	1,500	2,100	6,625	1,350	8,250
Accel Length						550	150						
Decel Length	150	150							150				
Mainline Volume	5,810	5,080	4,340	4,340	4,490	4,490	4,670	5,300	5,300	4,080	4,080	3,860	3,860
On Ramp Volume				540		180	630				410		900
Off Ramp Volume	730	740		390					1,220		630		1,600
Express Lane Volume	872	762	651	564	584	584	607	795	795	612	612	579	540
EL On Ramp Volume													
EL Off Ramp Volume													
Calculate Flow Rate in General Purpose Lanes (GP)													
GP Volume (vph)	4,939	4,318	3,689	4,316	3,906	4,086	4,693	4,505	4,505	3,468	3,878	3,281	4,220
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
GP Lanes	3	3	3	4	3	3	3	3	3	3	3	2	3
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	6.0	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.952	0.995	0.995	0.995	0.995	0.995
f _P	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	5,117	4,474	3,822	4,472	4,047	4,234	4,862	4,877	4,668	3,593	4,018	3,399	4,372
GP Flow (pcphpl)	1,706	1,491	1,274	1,118	1,349	1,411	1,621	1,626	1,556	1,198	1,339	1,700	1,457
Calculate Speed in General Purpose Lanes													
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes													
v/c ratio	0.73	0.63	0.54	0.48	0.57	0.60	0.69	0.69	0.66	0.51	0.57	0.72	0.62
Speed (mph)	63.7	64.9	65.0	65.0	65.0	65.0	64.3	64.3	64.7	65.0	65.0	63.7	65.0
Density (pcphpl)	26.8	23.0	19.6	17.2	20.8	21.7	25.2	25.3	24.1	18.4	20.6	26.7	22.4
LOS	D	C	C	B	C	C	C	C	C	C	C	D	C
Calculate Operations for Entering GP Lanes													
GP _{IN} Vol (pcph)				3,897		4,042	4,192				3,582		3,379
GP _{IN} Cap (pcph)				7,050		7,050	7,050				4,700		4,700
GP _{IN} v/c ratio				0.55		0.57	0.59				0.76		0.72
Calculate Operations for Exiting GP Lanes													
GP _{OUT} Vol (pcph)	4,341	3,687		4,055					3,397	3,593	3,323		2,596
GP _{OUT} Cap (pcph)	7,050	7,050		7,050					7,050	4,700	4,700		4,700
GP _{OUT} v/c ratio	0.62	0.52		0.58					0.48	0.76	0.71		0.55



Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Flow Rate in Express Lanes (EL)													
EL Volume (vph)	872	762	651	564	584	584	607	795	795	612	612	579	540
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990
f _P	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	978	855	731	633	655	655	681	963	892	687	687	650	606
EL Flow (pcphpl)	978	855	731	633	655	655	681	963	892	687	687	650	606
Calculate Speed in Express Lanes													
Lane Width (ft)													
Shoulder Width													
TRD													
f _{LW}													
f _{LC}													
Calc'd FFS													
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes													
EL _N v/c ratio	0.56	0.49	0.42	0.36	0.37	0.37	0.39	0.55	0.51	0.39	0.39	0.37	0.35
Calculate On Ramp Flow Rate													
On Volume (vph)				540		180	630				410		900
PHF				0.95		0.95	0.95				0.95		0.92
Total Lanes				1		1	1				1		1
Terrain				Level		Level	Level				Level		Level
Grade %				0.0%		0.0%	0.0%				0.0%		0.0%
Grade Length (mi)				0.00		0.00	0.00				0.00		0.00
Truck & Bus %				2.0%		2.0%	2.0%				2.0%		3.0%
RV %				0.0%		0.0%	0.0%				0.0%		0.0%
E _T				1.5		1.5	1.5				1.5		1.5
E _R				1.2		1.2	1.2				1.2		1.2
f _{HV}				0.990		0.990	0.990				0.990		0.985
f _P				1.00		1.00	1.00				1.00		1.00
On Flow (pcph)				574		191	670				436		993
On Flow (pcphpl)				574		191	670				436		993
Calculate On Ramp Roadway Operations													
On Ramp Type				Right		Right	Right				Right		Right
On Ramp Speed (mph)				45		25	45				45		25
On Ramp Cap (pcph)				2,100		1,900	2,100				2,100		1,900
On Ramp v/c ratio				0.27		0.10	0.32				0.21		0.52

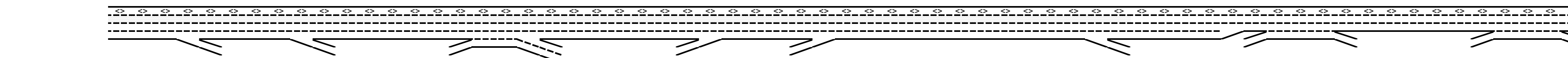
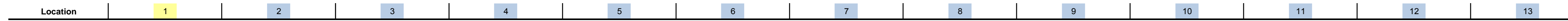


Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Off Ramp Flow Rate													
Off Volume (vph)	730	740		390					1,220		630		1,600
PHF	0.95	0.95		0.95					0.97		0.92		0.91
Total Lanes	1	1		2					1		1		1
Terrain	Level	Level		Level					Level		Level		Level
Grade %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
Grade Length (mi)	0.00	0.00		0.00					0.00		0.00		0.00
Truck & Bus %	2.0%	2.0%		3.0%					2.0%		3.0%		2.0%
RV %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
E _T	1.5	1.5		1.5					1.5		1.5		1.5
E _R	1.2	1.2		1.2					1.2		1.2		1.2
f _{HV}	0.990	0.990		0.985					0.990		0.985		0.990
f _p	1.00	1.00		1.00					1.00		1.00		1.00
Off Flow (pcph)	776	787		417					1,270		695		1,776
Off Flow (pcphpl)	776	787		208					1,270		695		1,776
Calculate Off Ramp Roadway Operations													
Off Ramp Type	Right	Right		Right					Right		Right		Right
Off Ramp Speed	45	25		45					45		45		45
Off Ramp Cap (pcph)	2,100	1,900		4,200					2,100		2,100		2,100
Off Ramp v/c ratio	0.37	0.41		0.10					0.60		0.33		0.85
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps													
Calculate Merge Influence Area Operations													



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Diverge Influence Area Operations													
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments													
On to Off Volume (vph)				419							162		551
PHF				0.95							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				2.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.990							0.990		0.985
f _P				1.00							1.00		1.00
On to Off Flow (pcph)				445							172		608
Calculate On Ramp to Mainline Flow Rate for Weave Segments													
On to ML Volume (vph)				121							248		349
PHF				0.95							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				2.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.990							0.990		0.985
f _P				1.00							1.00		1.00
On to ML Flow (pcph)				129							264		385
Calculate Mainline to Off Ramp Flow Rate for Weave Segments													
ML to Off Volume (vph)				-29							468		1,049
PHF				0.95							0.92		0.91
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				3.0%							3.0%		2.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.985							0.985		0.990
f _P				1.00							1.00		1.00
ML to Off Flow (pcph)				-31							516		1,164



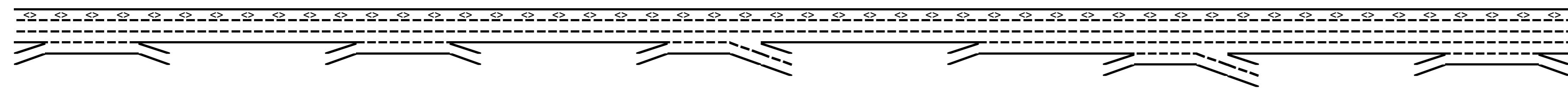
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments													
GP to GP Volume (vph)				3,805							3,000		2,271
PHF				0.97							0.97		0.97
Terrain				Grade							Level		Level
Grade %				3.0%							0.0%		0.0%
Grade Length (mi)				0.41							0.00		0.00
Truck & Bus %				1.0%							1.0%		1.0%
RV %				0.0%							0.0%		0.0%
E _T				2.0							1.5		1.5
E _R				2.5							1.2		1.2
f _{HV}				0.990							0.995		0.995
f _P				1.00							1.00		1.00
GP to GP Flow (pcph)				3,962							3,108		2,353
Calculate Weave Segment Operations													
Weave Type				One-sided							One-sided		One-sided
Weave Length				2,000							5,625		7,250
Segment Lanes				3							2		2
Weave Lanes				2					3		2		2
Weave Flow (pcph)				98							780		1,549
Non-Weave Flow				4,407							3,280		2,960
Segment Flow				4,505							4,060		4,510
Max Weave Length				2,796							4,456		6,056
Length Check				OK							Not a Weave		Not a Weave
Ideal Weave Capacity				2,289							2,439		2,441
f _{HV}				0.990							0.993		0.992
f _P				1.000							0.999		0.999
Capacity Condition 1				6,798							4,843		4,836
Capacity Condition 2				109,585							12,402		6,918
Weave v/c ratio				0.66							0.83		0.92
Interchange Density				3							2		2
Lane Changes On to ML				1							1		1
Lane Changes ML to Off				0							1		1
Lane Changes On to Off				0							0		0
Min Lane Change Rate				129							780		1,549
Weave LC Rate				724							2,909		4,312
Non-Weave LC Rate 1				1,414							3,339		4,154
Non-Weave LC Rate 2				2,672							2,421		2,349
Non-Weave LC Rate 3				4,015							-40		-4,156
Segment LC Rate				3,396							5,329		6,661
Weave Intensity Factor				0.343							0.217		0.211
Weave Speed				52.2							56.1		56.3
Non-Weave Speed				56.9							49.6		43.0
Segment Speed				56.8							50.8		46.8
Weave Density				26.5							-		-
Weave LOS				C							Basic		Basic
Summarize Segment Operations													
Segment v/c ratio	0.79	0.69	0.54	0.66	0.57	0.56	0.68	0.69	0.74	0.51	0.57	0.72	0.62
Segment Density	32.9	29.1	19.6	26.5	20.8	22.1	28.5	25.3	30.9	18.4	20.6	26.7	22.4
Segment LOS	D	D	C	C	C	C	D	C	D	C	C	D	C
Over Capacity													

Project: **Marble Valley EIR**
Freeway Corridor: **Westbound US 50**
Alternative: **Cumulative No Project**
Time Period: **AM Peak Hour**

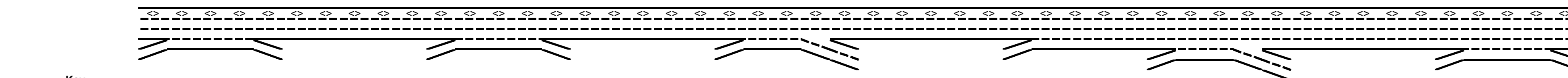
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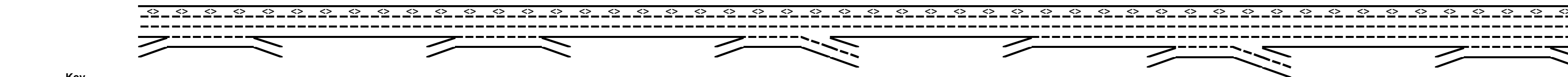
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Define Freeway Segment										
Type	Weave	Basic	Weave	Basic	Weave	Basic	Basic	Weave	Basic	Weave
Length (ft)	7,325	1,250	8,250	2,350	6,500	2,350	800	2,800	2,300	4,775
Accel Length										
Decel Length										
Mainline Volume	3,300	3,350	3,350	3,810	3,810	4,020	4,020	4,100	4,300	4,300
On Ramp Volume	850		730		1,270		80	680		1,560
Off Ramp Volume	800		270		1,060			480		1,870
Express Lane Volume	495	503	536	610	610	643	643	615	774	774
EL On Ramp Volume										
EL Off Ramp Volume										
Calculate Flow Rate in General Purpose Lanes (GP)										
GP Volume (vph)	3,655	2,848	3,544	3,200	4,470	3,377	3,457	4,165	3,526	5,086
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
GP Lanes	3	2	3	2	3	2	4	4	3	4
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	3,908	3,044	3,789	3,422	4,780	3,610	3,696	4,453	3,770	5,438
GP Flow (pcphpl)	1,303	1,522	1,263	1,711	1,593	1,805	924	1,113	1,257	1,359
Calculate Speed in General Purpose Lanes										
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes										
w/c ratio	0.55	0.65	0.54	0.73	0.68	0.77	0.39	0.47	0.53	0.58
Speed (mph)	65.0	64.8	65.0	63.6	64.5	62.7	65.0	65.0	65.0	65.0
Density (pcphpl)	20.0	23.5	19.4	26.9	24.7	28.8	14.2	17.1	19.3	20.9
LOS	C	C	C	D	C	D	B	B	C	C
Calculate Operations for Entering GP Lanes										
GP _N Vol (pcph)	2,975		3,021		3,423		3,611	3,730		3,779
GP _N Cap (pcph)	4,700		4,700		4,700		4,700	7,050		7,050
GP _N w/c ratio	0.63		0.64		0.73		0.77	0.53		0.54
Calculate Operations for Exiting GP Lanes										
GP _{OUT} Vol (pcph)			3,501		3,653			3,940		3,440
GP _{OUT} Cap (pcph)			4,700		4,700			7,050		7,050
GP _{OUT} w/c ratio			0.74		0.78			0.56		0.49



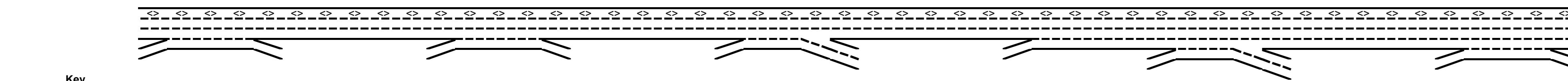
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Flow Rate in Express Lanes (EL)										
EL Volume (vph)	495	503	536	610	610	643	643	615	774	774
PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Express Lanes	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	562	570	608	692	692	730	730	698	878	878
EL Flow (pcphpl)	562	570	608	692	692	730	730	698	878	878
Calculate Speed in Express Lanes										
Lane Width (ft)										
Shoulder Width										
TRD										
f _{LW}										
f _{LC}										
Calc'd FFS										
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes										
EL _{av} v/c ratio	0.32	0.33	0.35	0.40	0.40	0.42	0.42	0.40	0.50	0.50
Calculate On Ramp Flow Rate										
On Volume (vph)	850		730		1,270		80	680		1,560
PHF	0.92		0.96		0.95		0.95	0.95		0.95
Total Lanes	1		1		1		1	1		1
Terrain	Level		Level		Level		Level	Level		Level
Grade %	0.0%		0.0%		0.0%		0.0%	0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00		0.00	0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%		2.0%	2.0%		2.0%
RV %	0.0%		0.0%		0.0%		0.0%	0.0%		0.0%
E _T	1.5		1.5		1.5		1.5	1.5		1.5
E _R	1.2		1.2		1.2		1.2	1.2		1.2
f _{RV}	0.990		0.990		0.985		0.990	0.990		0.990
f _p	1.00		1.00		1.00		1.00	1.00		1.00
On Flow (pcph)	933		768		1,357		85	723		1,659
On Flow (pcphpl)	933		768		1,357		85	723		1,659
Calculate On Ramp Roadway Operations										
On Ramp Type	Right		Right				Right	Right		Right
On Ramp Speed (mph)	45		25				25	45		45
On Ramp Cap (pcph)	2,100		1,900				1,900	2,100		2,100
On Ramp v/c ratio	0.44		0.40				0.04	0.34		0.79

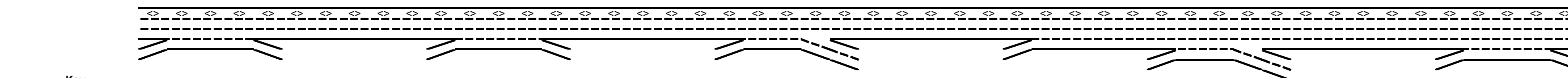


Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Off Ramp Flow Rate										
Off Volume (vph)	800		270		1,060			480		1,870
PHF	0.66		0.95		0.95			0.95		0.95
Total Lanes	1		1		2			2		1
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
Off Flow (pcph)	1,224		288		1,127			513		1,998
Off Flow (pcphpl)	1,224		288		563			256		1,998
Calculate Off Ramp Roadway Operations										
Off Ramp Type	Right		Right		Right			Right		Right
Off Ramp Speed	45		45		45			25		45
Off Ramp Cap (pcph)	2,100		2,100		4,200			3,800		2,100
Off Ramp v/c ratio	0.58		0.14		0.27			0.13		0.95
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps										
Up Type			Off		Off					
Up Distance			1,250		2,350					
Up Flow (pcph)			1,224		288					
Down Type	On		No		On					
Down Distance	1,250				8,850					
Down Flow (pcph)	768				85					
Calculate Merge Influence Area Operations										

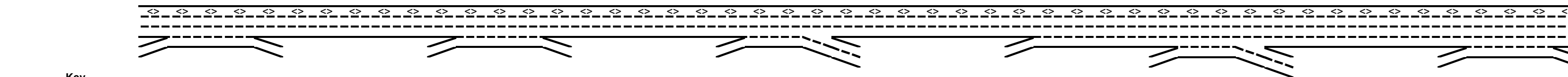
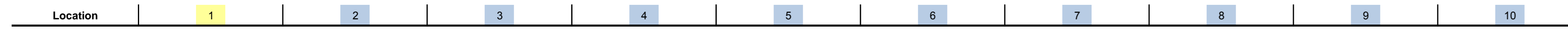


Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Diverge Influence Area Operations										
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments										
On to Off Volume (vph)	228		112		785			164		830
PHF	0.92		0.96		0.95			0.95		0.95
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to Off Flow (pcph)	250		118		839			174		882
Calculate On Ramp to Mainline Flow Rate for Weave Segments										
On to ML Volume (vph)	622		618		485			516		730
PHF	0.92		0.96		0.95			0.95		0.95
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to ML Flow (pcph)	683		650		518			549		776



Key
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 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Mainline to Off Ramp Flow Rate for Weave Segments										
ML to Off Volume (vph)	572		158		275			316		1,040
PHF	0.66		0.95		0.95			0.95		0.95
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
ML to Off Flow (pcph)	875		169		292			338		1,111
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments										
GP to GP Volume (vph)	2,233		2,656		2,925			3,169		2,486
PHF	0.94		0.94		0.94			0.94		0.94
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	1.0%		1.0%		1.0%			1.0%		1.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.995		0.995		0.995			0.995		0.995
f _p	1.00		1.00		1.00			1.00		1.00
GP to GP Flow (pcph)	2,387		2,840		3,128			3,388		2,658



Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Weave Segment Operations										
Weave Type	One-sided		One-sided		One-sided			One-sided		One-sided
Weave Length	6,325		7,250		5,500			1,800		3,775
Segment Lanes	2		2		3			3		3
Weave Lanes	2		2		3			3		3
Weave Flow (pcph)	1,558		819		811			886		1,887
Non-Weave Flow	2,638		2,957		3,966			3,562		3,540
Segment Flow	4,196		3,776		4,777			4,449		5,428
Max Weave Length	6,362		4,709		2,663			2,962		4,535
Length Check	OK		Not a Weave		Not a Weave			OK		OK
Ideal Weave Capacity	2,347		2,544		2,567			2,261		2,292
f_{wv}	0.993		0.994		0.992			0.993		0.992
f_p	0.998		0.998		0.998			0.999		0.999
Capacity Condition 1	4,654		5,047		5,085			6,731		6,807
Capacity Condition 2	6,407		10,977		20,428			17,434		9,966
Weave v/c ratio	0.89		0.74		0.93			0.66		0.79
Interchange Density	3		5		5			4		3
Lane Changes On to ML	1		1		1			1		1
Lane Changes ML to Off	1		1		1			1		1
Lane Changes On to Off	0		0		0			0		0
Min Lane Change Rate	1,558		819		811			886		1,887
Weave LC Rate	3,943		3,533		2,842			1,368		3,175
Non-Weave LC Rate 1	3,586		4,154		3,413			1,132		2,198
Non-Weave LC Rate 2	2,277		2,349		2,574			2,483		2,478
Non-Weave LC Rate 3	-3,876		-22,008		-8,994			3,762		3,369
Segment LC Rate	6,220		5,882		5,416			3,851		5,654
Weave Intensity Factor	0.223		0.192		0.223			0.412		0.311
Weave Speed	55.9		57.0		55.9			50.4		53.1
Non-Weave Speed	43.7		50.0		47.7			51.5		42.7
Segment Speed	47.6		51.4		48.9			51.3		45.9
Weave Density	44.1		-		-			28.9		39.5
Weave LOS	E		Basic		Basic			D		E
Summarize Segment Operations										
Segment v/c ratio	0.89	0.65	0.54	0.73	0.68	0.77	0.39	0.66	0.53	0.79
Segment Density	44.1	23.5	19.4	26.9	24.7	28.8	14.2	28.9	19.3	39.5
Segment LOS	E	C	C	D	C	D	B	D	C	E
Over Capacity										

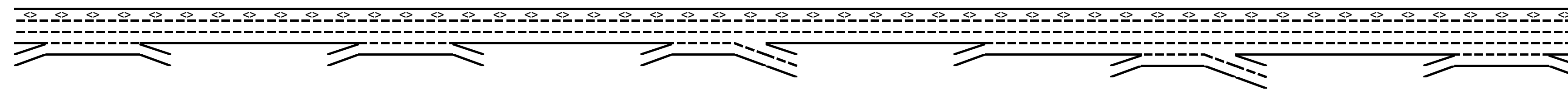
Project: Marble Valley EIR
Freeway Corridor: Westbound US 50

Alternative: Cumulative No Project
Time Period: PM Peak Hour

Data Entry Value

Calculated Value

Location	1	2	3	4	5	6	7	8	9	10
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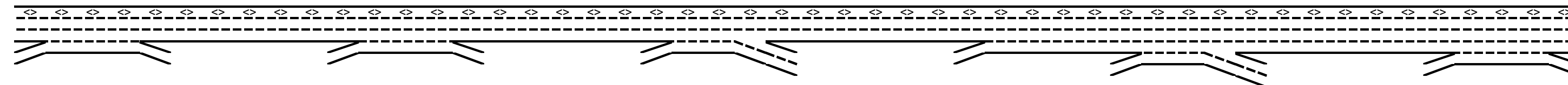
Key

<> Express Lane (HOV)

No Trucks

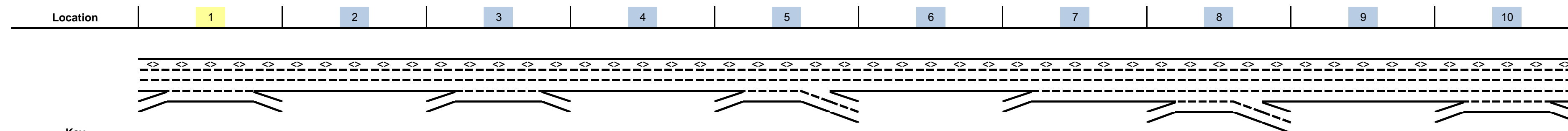
Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Define Freeway Segment										
Type	Weave	Basic	Weave	Basic	Weave	Basic	Basic	Weave	Basic	Weave
Length (ft)	7,325	1,250	8,250	2,350	6,500	2,350	800	2,800	2,300	4,775
Accel Length										
Decel Length										
Mainline Volume	4,060	3,990	3,990	4,060	4,060	3,630	3,630	3,710	3,440	3,440
On Ramp Volume	960		480		850		80	220		1,480
Off Ramp Volume	1,030		410		1,280			490		1,650
Express Lane Volume	609	599	678	690	609	545	508	519	482	482
EL On Ramp Volume										
EL Off Ramp Volume										
Calculate Flow Rate in General Purpose Lanes (GP)										
GP Volume (vph)	4,411	3,392	3,792	3,370	4,301	3,086	3,202	3,411	2,958	4,438
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
GP Lanes	3	2	3	2	3	2	4	4	3	4
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	4,618	3,550	3,969	3,528	4,503	3,230	3,352	3,570	3,097	4,646
GP Flow (pcphpl)	1,539	1,775	1,323	1,764	1,501	1,615	838	893	1,032	1,162
Calculate Speed in General Purpose Lanes										
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes										
v/c ratio	0.66	0.76	0.56	0.75	0.64	0.69	0.36	0.38	0.44	0.49
Speed (mph)	64.7	63.0	65.0	63.1	64.9	64.3	65.0	65.0	65.0	65.0
Density (pcphpl)	23.8	28.2	20.4	27.9	23.1	25.1	12.9	13.7	15.9	17.9
LOS	C	D	C	D	C	C	B	B	B	B
Calculate Operations for Entering GP Lanes										
GP _{IN} Vol (pcph)	3,540		3,431		3,604		3,267	3,337		3,073
GP _{IN} Cap (pcph)	4,700		4,700		4,700		4,700	7,050		7,050
GP _{IN} v/c ratio	0.75		0.73		0.77		0.70	0.47		0.44
Calculate Operations for Exiting GP Lanes										
GP _{OUT} Vol (pcph)	3,449		3,531		3,142			3,047		2,884
GP _{OUT} Cap (pcph)	4,700		4,700		4,700			7,050		7,050
GP _{OUT} v/c ratio	0.73		0.75		0.67			0.43		0.41

Location	1	2	3	4	5	6	7	8	9	10
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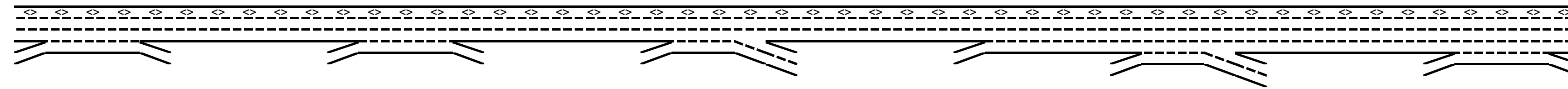
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Flow Rate in Express Lanes (EL)										
EL Volume (vph)	609	599	678	690	609	545	508	519	482	482
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	683	672	761	775	683	611	570	583	540	540
EL Flow (pcphpl)	683	672	761	775	683	611	570	583	540	540
Calculate Speed in Express Lanes										
Lane Width (ft)										
Shoulder Width										
TRD										
f _{LW}										
f _{LC}										
Calc'd FFS										
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes										
EL _{ex} v/c ratio	0.39	0.38	0.43	0.44	0.39	0.35	0.33	0.33	0.31	0.31
Calculate On Ramp Flow Rate										
On Volume (vph)	960		480		850		80	220		1,480
PHF	0.9		0.9		0.96		0.95	0.95		0.95
Total Lanes	1		1		1		1	1		1
Terrain	Level		Level		Level		Level	Level		Level
Grade %	0.0%		0.0%		0.0%		0.0%	0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00		0.00	0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%		2.0%	2.0%		2.0%
RV %	0.0%		0.0%		0.0%		0.0%	0.0%		0.0%
E _T	1.5		1.5		1.5		1.5	1.5		1.5
E _R	1.2		1.2		1.2		1.2	1.2		1.2
f _{RV}	0.990		0.990		0.985		0.990	0.990		0.990
f _p	1.00		1.00		1.00		1.00	1.00		1.00
On Flow (pcph)	1,077		539		899		85	234		1,573
On Flow (pcphpl)	1,077		539		899		85	234		1,573
Calculate On Ramp Roadway Operations										
On Ramp Type			Right				Right	Right		Right
On Ramp Speed (mph)	45		25				45	45		45
On Ramp Cap (pcph)			1,900				2,100	2,100		2,100
On Ramp v/c ratio			0.28				0.04	0.11		0.75



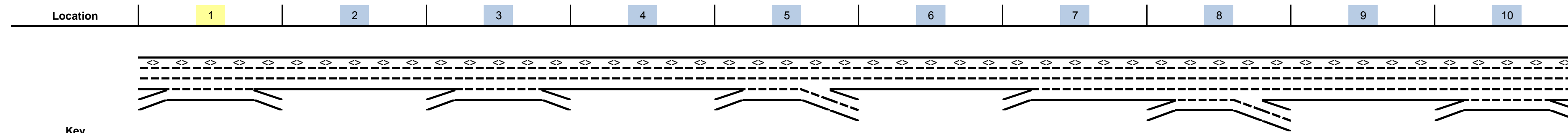
Key
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 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Off Ramp Flow Rate										
Off Volume (vph)	1,030		410		1,280			490		1,650
PHF	0.89		0.95		0.95			0.95		0.95
Total Lanes	1		1		2			2		1
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
Off Flow (pcph)	1,169		438		1,361			524		1,763
Off Flow (pcphpl)	1,169		438		680			262		1,763
Calculate Off Ramp Roadway Operations										
Off Ramp Type	Right		Right		Right			Right		Right
Off Ramp Speed	45		45		45			25		45
Off Ramp Cap (pcph)	2,100		2,100		4,200			3,800		2,100
Off Ramp v/c ratio	0.56		0.21		0.32			0.14		0.84
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps										
Up Type			Off		Off					
Up Distance			1,250		2,350					
Up Flow (pcph)			1,169		438					
Down Type	On		No		On					
Down Distance	1,250				8,850					
Down Flow (pcph)	539				85					
Calculate Merge Influence Area Operations										



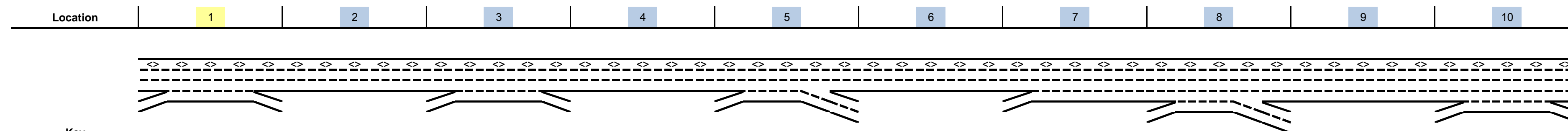
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Diverge Influence Area Operations										
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments										
On to Off Volume (vph)	434		150		400			83		686
PHF	0.9		0.9		0.96			0.95		0.95
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to Off Flow (pcph)	487		168		423			88		729
Calculate On Ramp to Mainline Flow Rate for Weave Segments										
On to ML Volume (vph)	526		330		450			137		794
PHF	0.9		0.9		0.96			0.95		0.95
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to ML Flow (pcph)	590		370		476			146		844



Key
 <> Express Lane (HOV)
 No Trucks

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Calculate Mainline to Off Ramp Flow Rate for Weave Segments										
ML to Off Volume (vph)	596		260		880			407		964
PHF	0.89		0.95		0.95			0.95		0.95
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{HV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
ML to Off Flow (pcph)	676		278		936			435		1,030
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments										
GP to GP Volume (vph)	2,855		3,052		2,571			2,784		1,994
PHF	0.96		0.96		0.96			0.96		0.96
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	1.0%		1.0%		1.0%			1.0%		1.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{HV}	0.995		0.995		0.995			0.995		0.995
f _p	1.00		1.00		1.00			1.00		1.00
GP to GP Flow (pcph)	2,989		3,195		2,692			2,914		2,088



Key
 <-> Express Lane (HOV)
 - - - - - No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Weave Segment Operations										
Weave Type	One-sided		One-sided		One-sided			One-sided		One-sided
Weave Length	6,325		7,250		5,500			1,800		3,775
Segment Lanes	2		2		2			3		3
Weave Lanes	2		2		3			3		3
Weave Flow (pcph)	1,267		648		1,411			581		1,874
Non-Weave Flow	3,476		3,363		3,114			3,002		2,817
Segment Flow	4,743		4,011		4,526			3,583		4,691
Max Weave Length	5,233		4,147		4,145			2,586		5,109
Length Check	Not a Weave		Not a Weave		Not a Weave			OK		OK
Ideal Weave Capacity	2,433		2,587		2,454			2,290		2,248
f_{wv}	0.993		0.994		0.992			0.994		0.991
f_p	0.999		0.999		0.998			1.000		0.998
Capacity Condition 1	4,828		5,137		4,861			6,822		6,673
Capacity Condition 2	8,914		14,746		11,117			21,453		8,669
Weave v/c ratio	0.97		0.78		0.92			0.52		0.70
Interchange Density	3		5		5			4		3
Lane Changes On to ML	1		1		1			1		1
Lane Changes ML to Off	1		1		1			1		1
Lane Changes On to Off	0		0		0			0		0
Min Lane Change Rate	1,267		648		1,411			581		1,874
Weave LC Rate	3,651		3,362		3,443			1,062		3,162
Non-Weave LC Rate 1	3,759		4,237		3,237			1,016		2,049
Non-Weave LC Rate 2	2,464		2,439		2,384			2,359		2,317
Non-Weave LC Rate 3	-6,790		-25,892		-6,306			2,796		2,830
Segment LC Rate	6,116		5,801		5,827			3,421		5,479
Weave Intensity Factor	0.220		0.190		0.237			0.375		0.303
Weave Speed	56.0		57.0		55.4			51.4		53.4
Non-Weave Speed	44.5		50.7		44.0			55.1		44.0
Segment Speed	47.1		51.6		47.0			54.4		47.3
Weave Density	-		-		-			21.9		33.0
Weave LOS	Basic		Basic		Basic			C		D
Summarize Segment Operations										
Segment v/c ratio	0.66	0.76	0.56	0.75	0.64	0.69	0.36	0.52	0.44	0.70
Segment Density	23.8	28.2	20.4	27.9	23.1	25.1	12.9	21.9	15.9	33.0
Segment LOS	C	D	C	D	C	C	B	C	B	D
Over Capacity										

Leisch Method for Weaving Analysis

Data Input

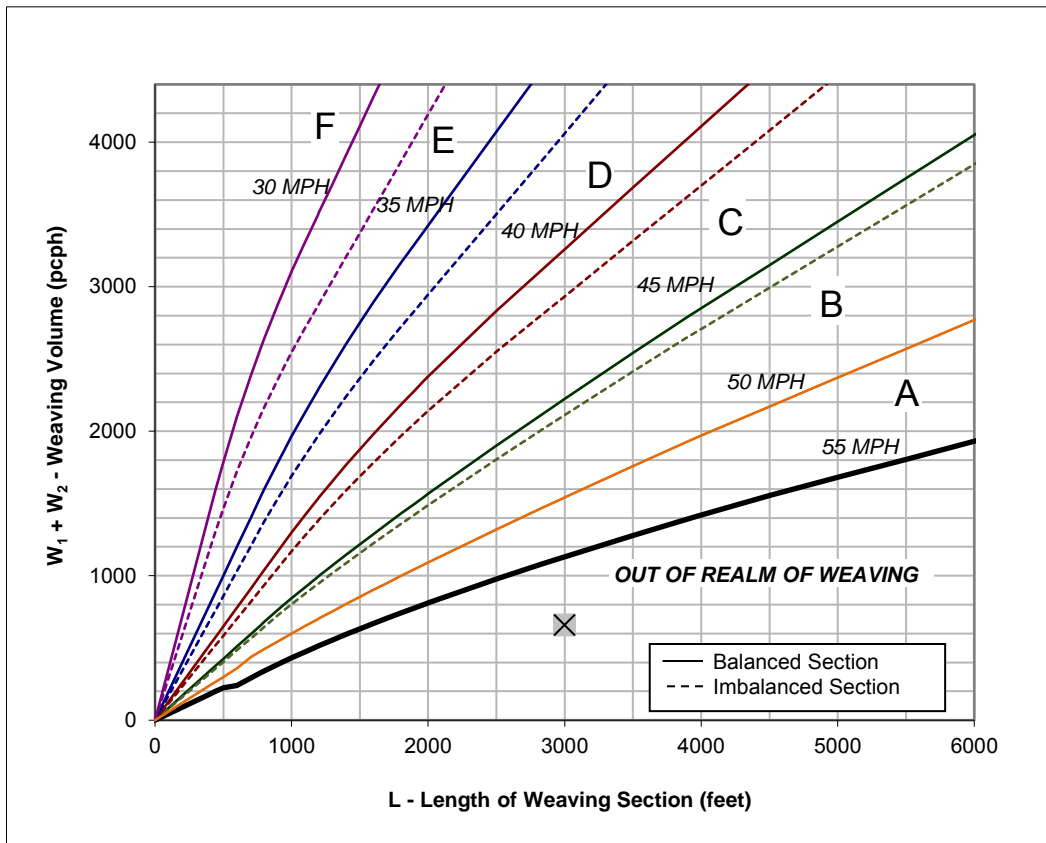
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,000

Project Information

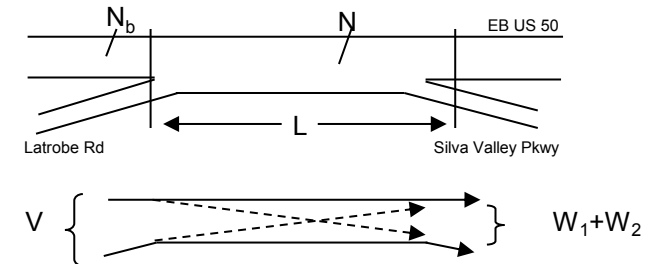
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	EB US 50
On-ramp	Latrobe Rd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,190	Volume (vph)*	466	Volume (vph)*	186
Truck Percentage	4%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,254	Volume (pcph)	470	Volume (pcph)	188

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

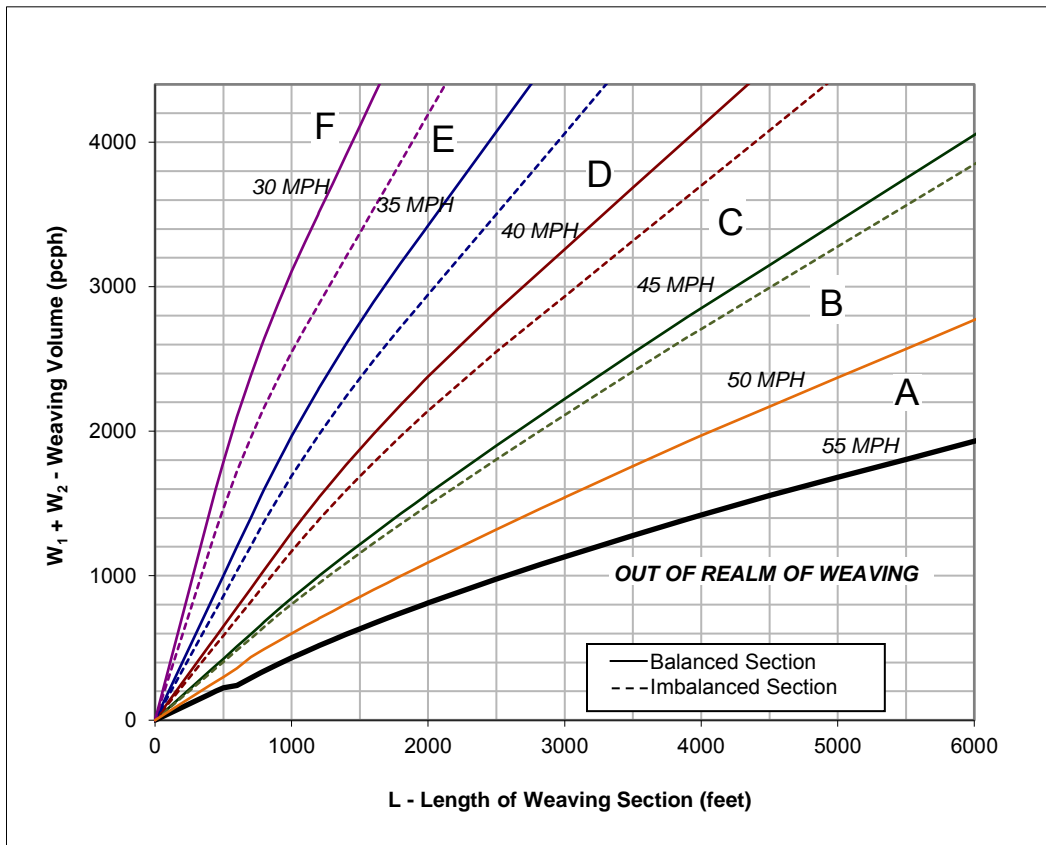
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	6,625

Project Information

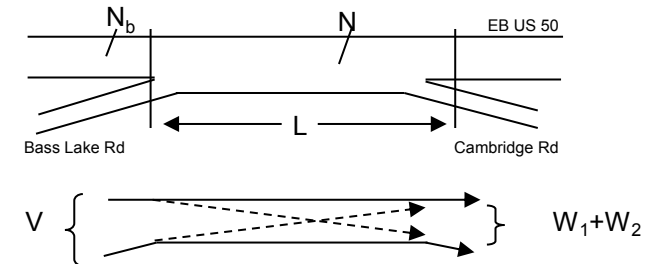
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	EB US 50
On-ramp	Bass Lake Rd
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,480	Volume (vph)*	343	Volume (vph)*	373
Truck Percentage	4%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,550	Volume (pcph)	346	Volume (pcph)	379

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

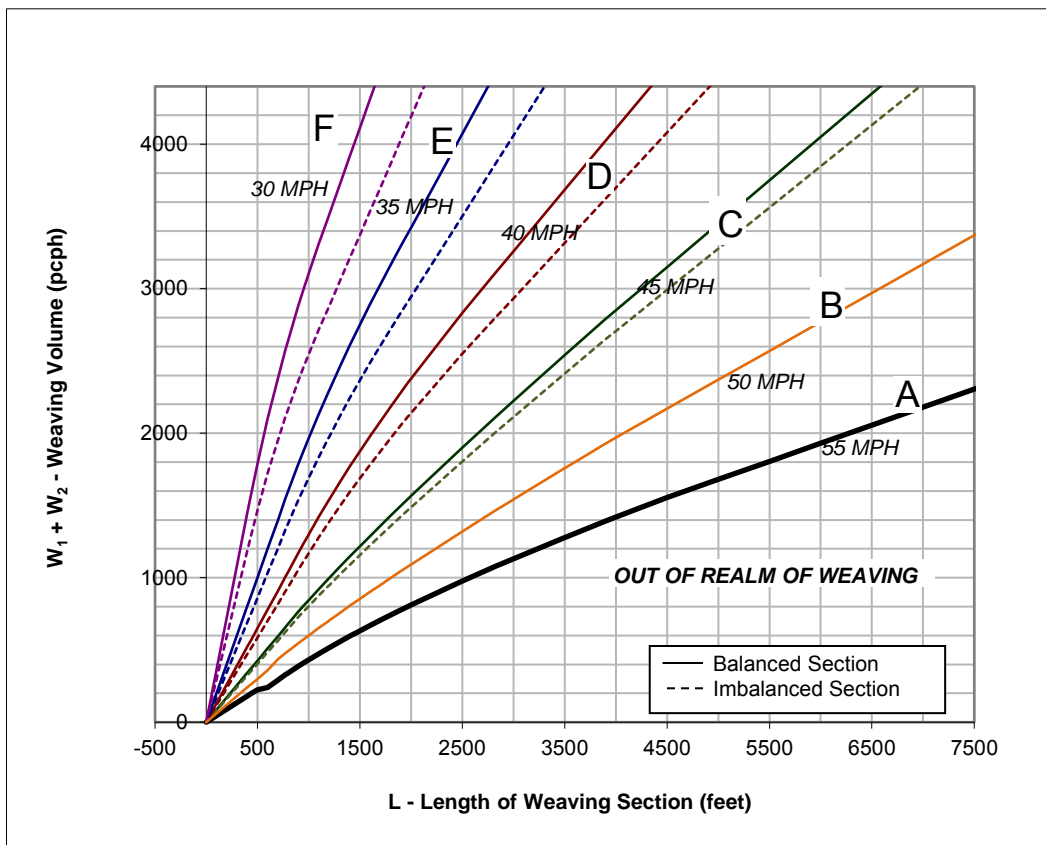
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

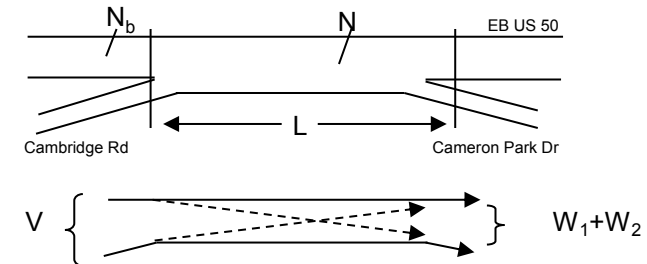
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	EB US 50
On-ramp	Cambridge Rd
Off-ramp	Cameron Park Dr

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,760	Volume (vph)*	539	Volume (vph)*	729
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,855	Volume (pcph)	547	Volume (pcph)	737

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

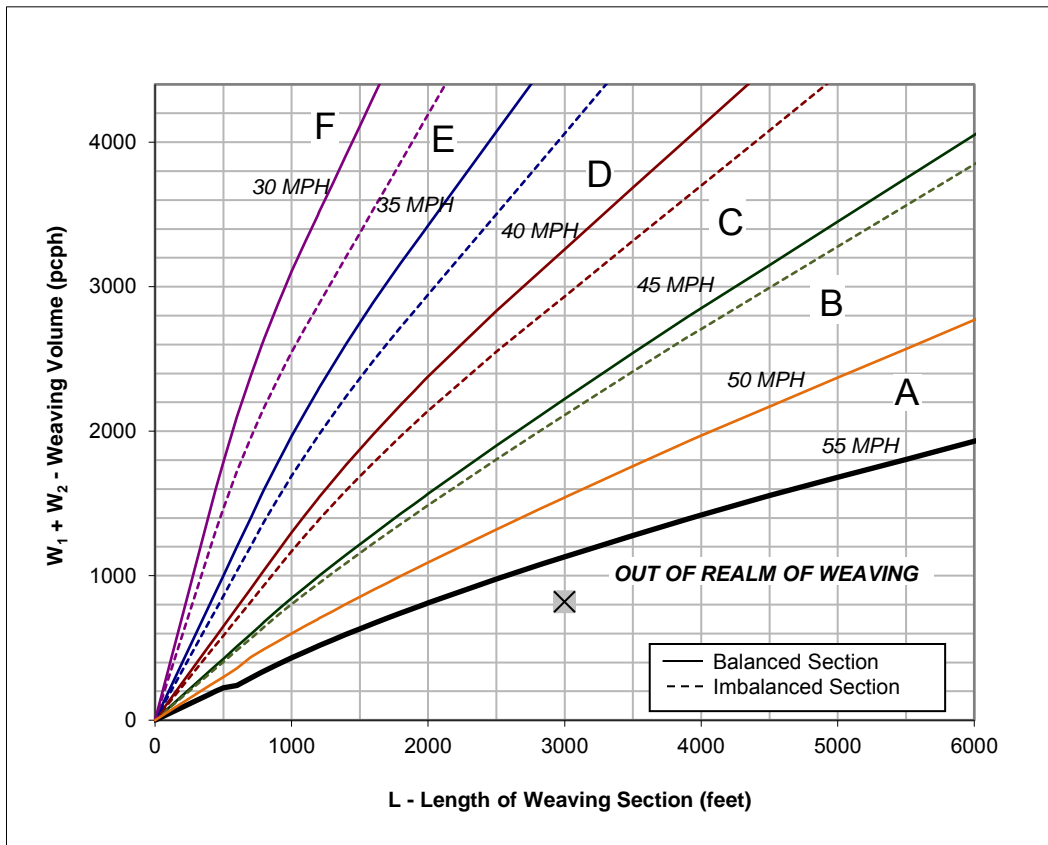
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,000

Project Information

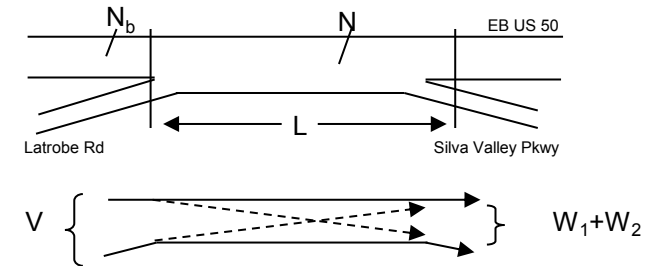
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	EB US 50
On-ramp	Latrobe Rd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,880	Volume (vph)*	481	Volume (vph)*	331
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,904	Volume (pcph)	485	Volume (pcph)	336

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

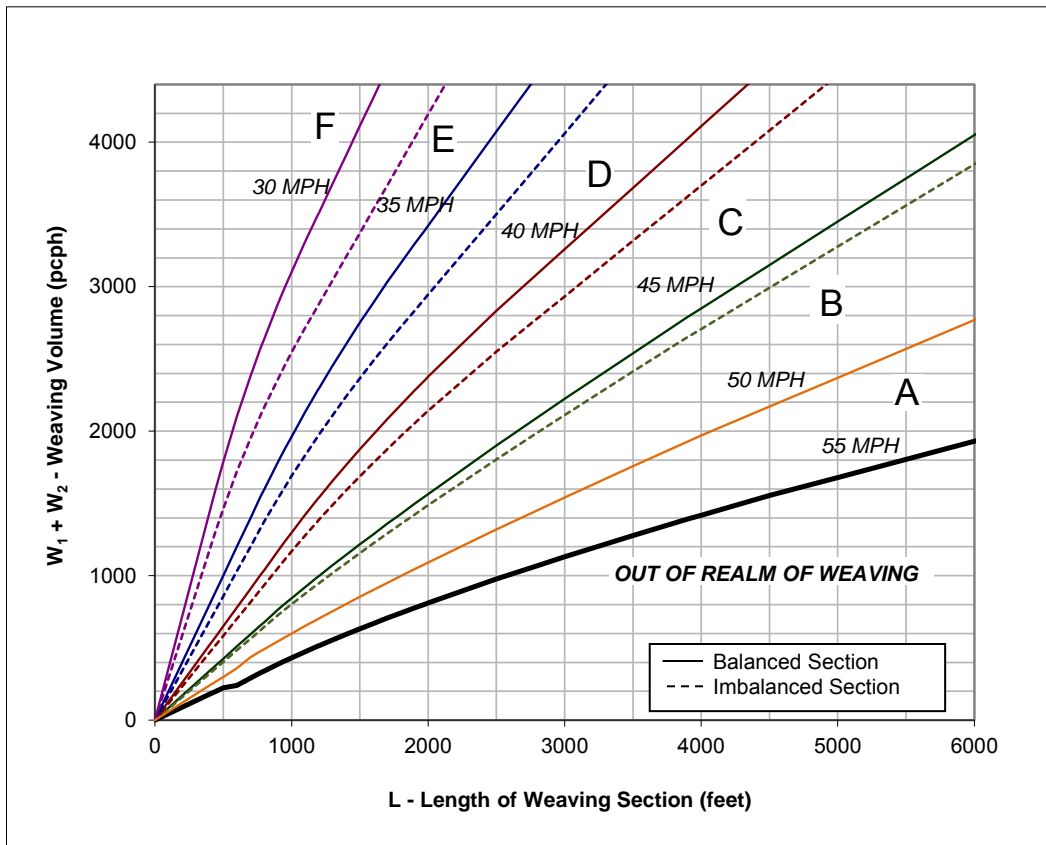
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	6,625

Project Information

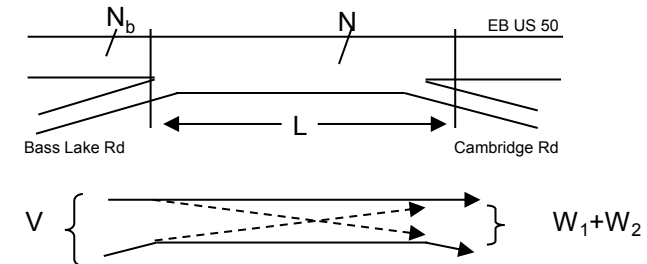
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	EB US 50
On-ramp	Bass Lake Rd
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,490	Volume (vph)*	172	Volume (vph)*	392
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,512	Volume (pcph)	174	Volume (pcph)	398

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?

55 MPH and -

If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.

3. Interpolated Weaving Speed (S_w , mph) -
4. Weaving Intensity Factor (k) -
5. Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
6. Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

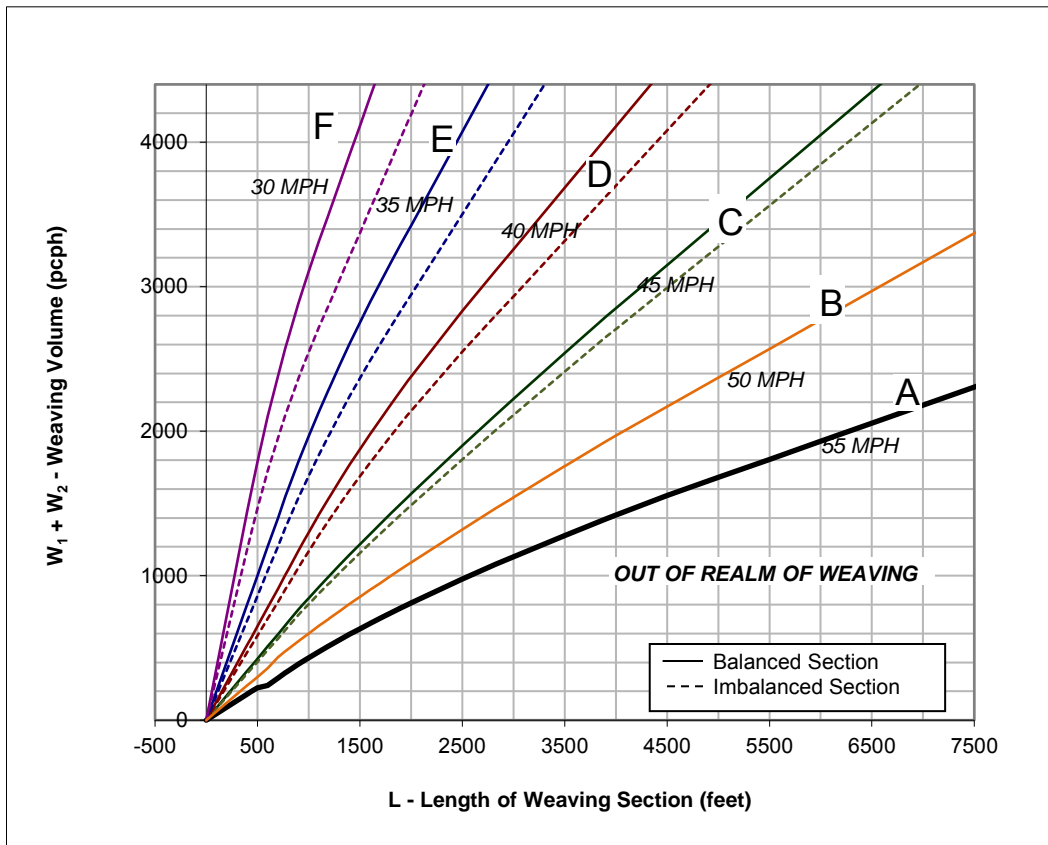
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

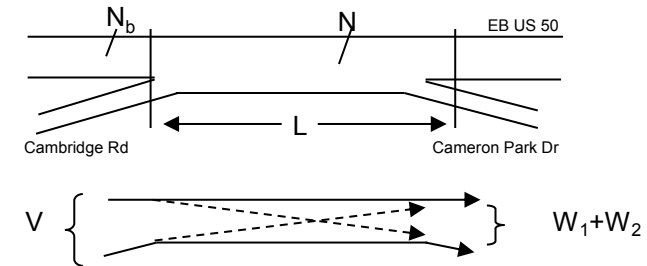
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	EB US 50
On-ramp	Cambridge Rd
Off-ramp	Cameron Park Dr

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,860	Volume (vph)*	342	Volume (vph)*	1,042
Truck Percentage	1%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,879	Volume (pcph)	347	Volume (pcph)	1,052

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

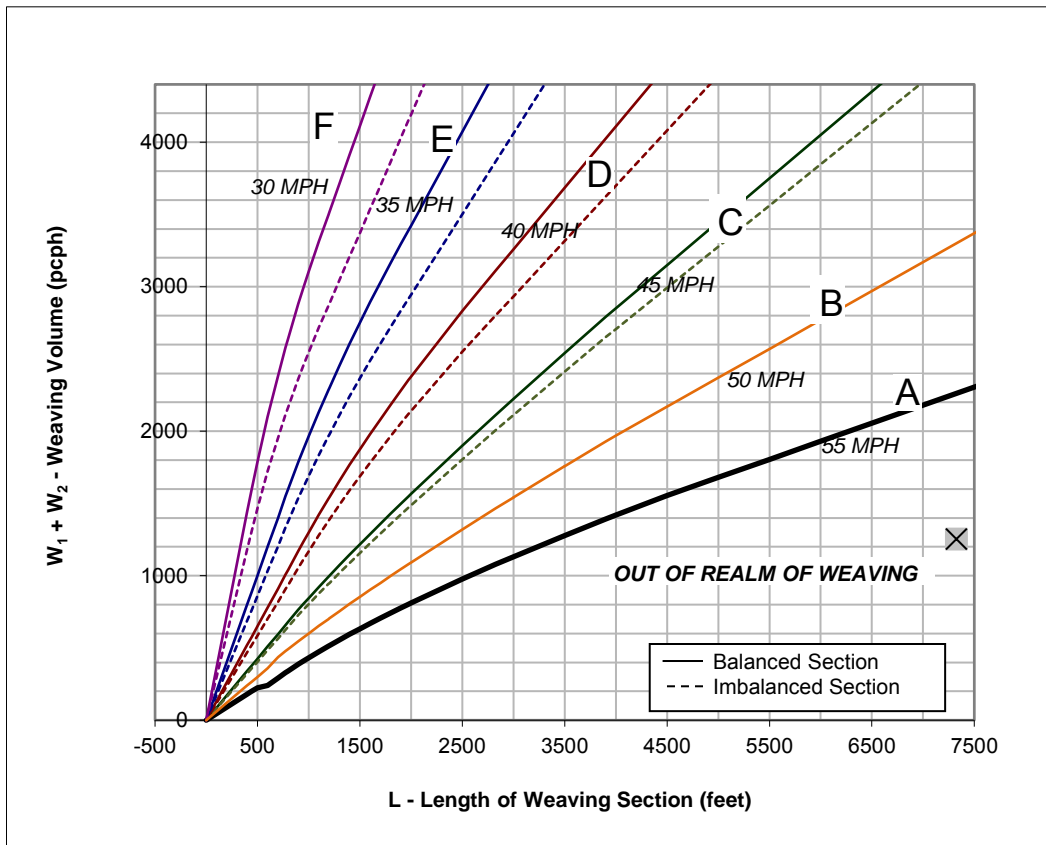
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	7,325

Project Information

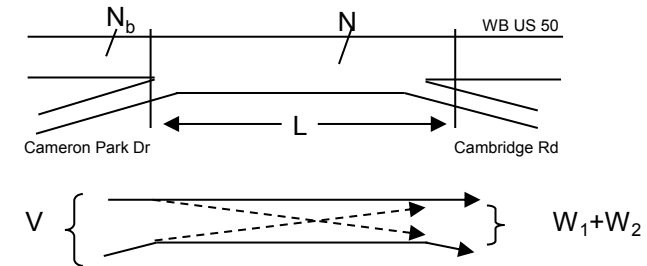
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	WB US 50
On-ramp	Cameron Park Dr
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,150	Volume (vph)*	646	Volume (vph)*	596
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,171	Volume (pcph)	652	Volume (pcph)	602

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

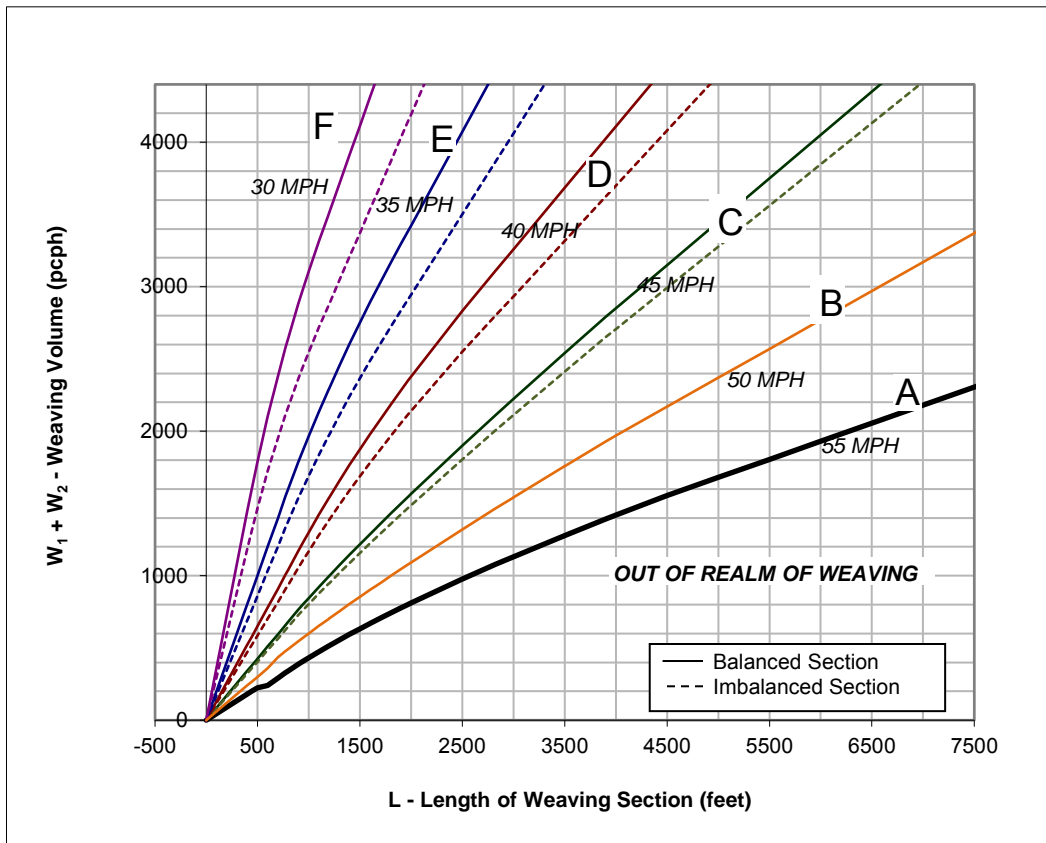
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

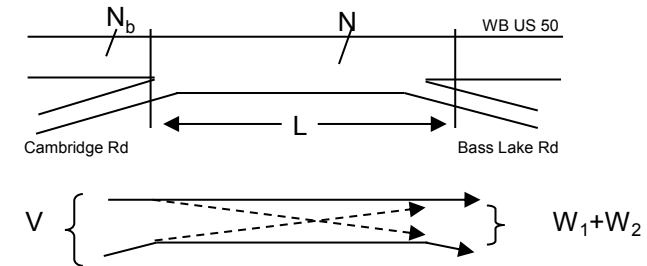
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	WB US 50
On-ramp	Cambridge Rd
Off-ramp	Bass Lake Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,080	Volume (vph)*	606	Volume (vph)*	146
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,100	Volume (pcph)	612	Volume (pcph)	148

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

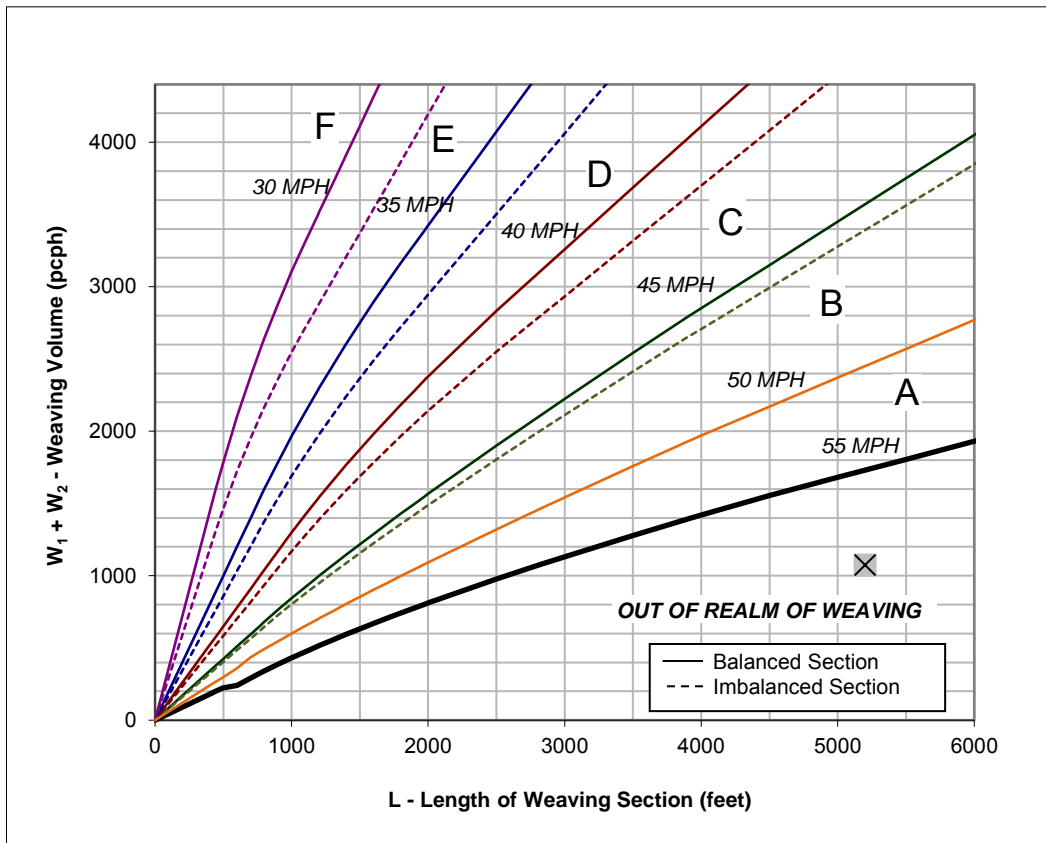
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	5,200

Project Information

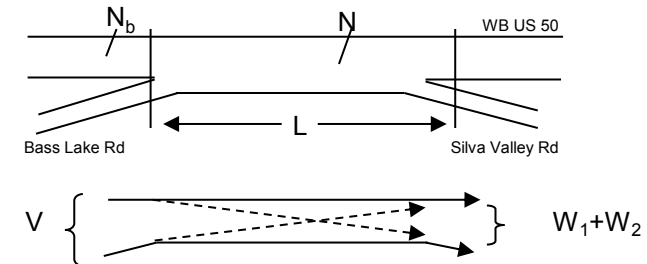
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	WB US 50
On-ramp	Bass Lake Rd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,080	Volume (vph)*	635	Volume (vph)*	425
Truck Percentage	1%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,105	Volume (pcph)	645	Volume (pcph)	429

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

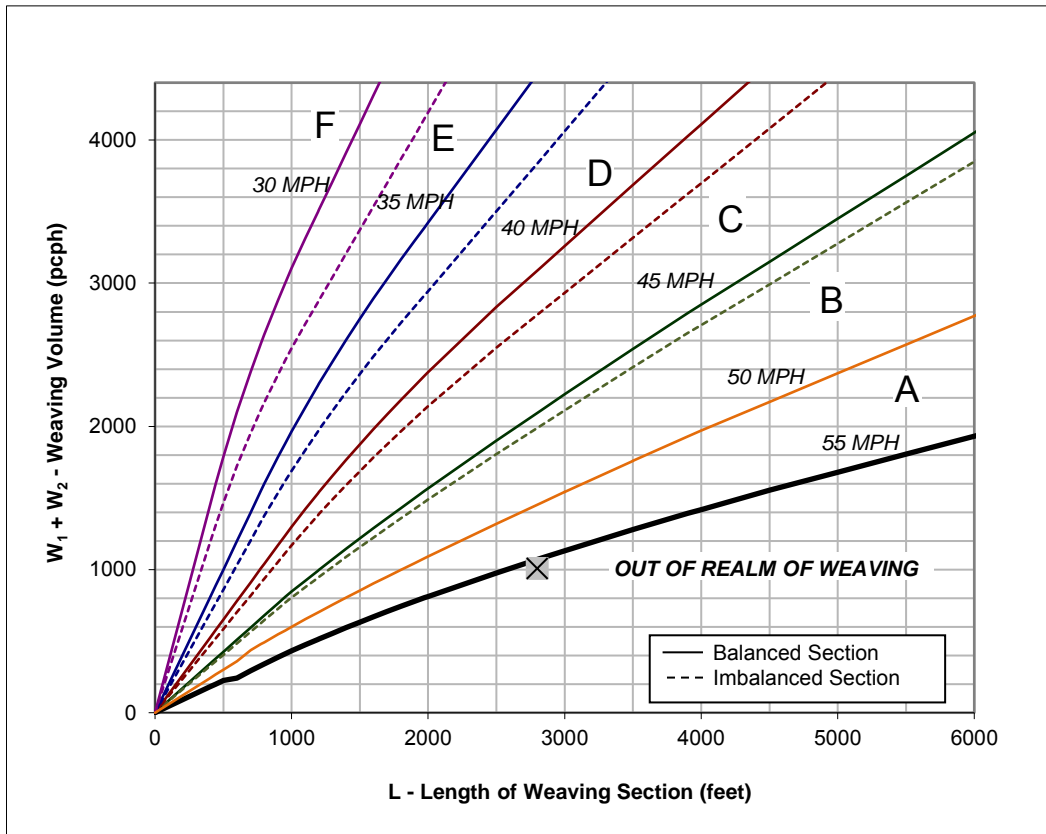
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,800

Project Information

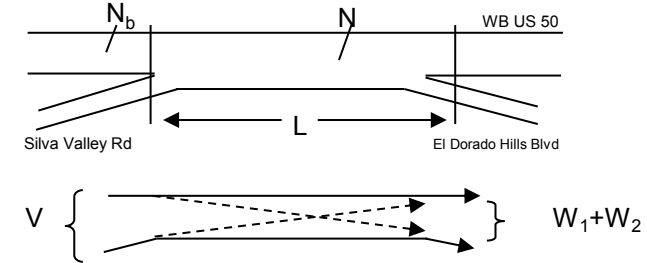
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	WB US 50
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,780	Volume (vph)*	598	Volume (vph)*	398
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,804	Volume (pcph)	604	Volume (pcph)	404

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

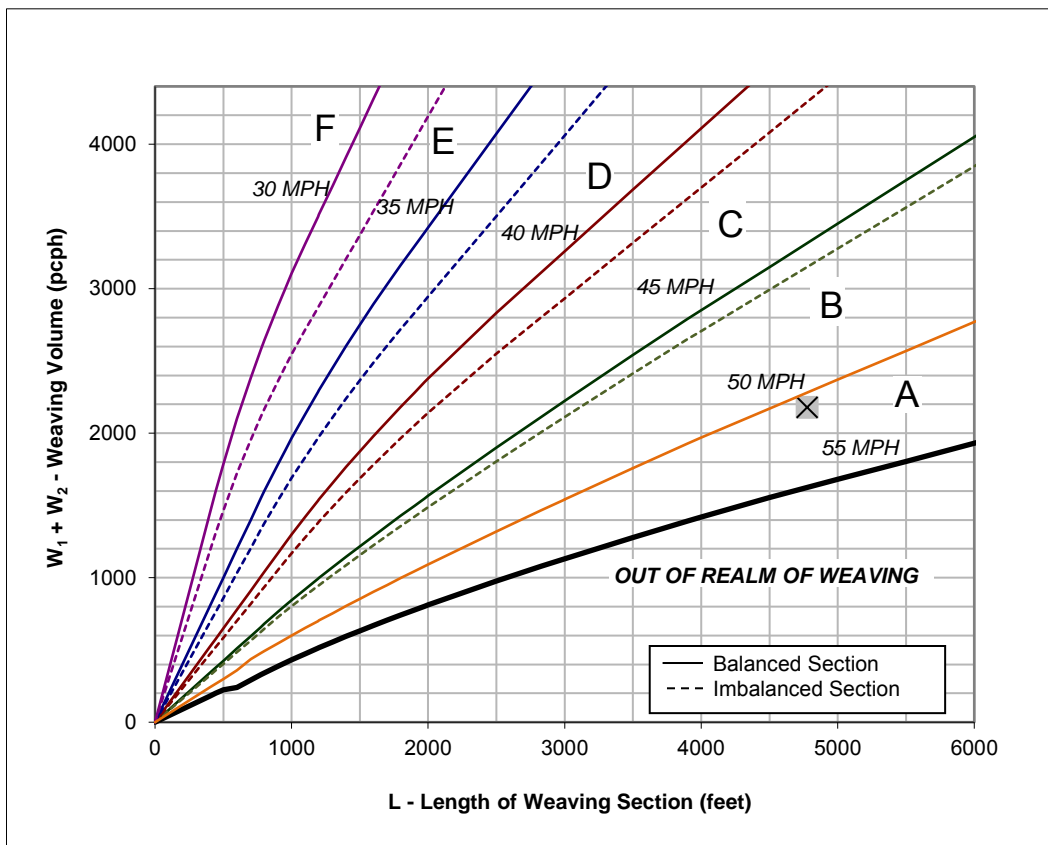
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	4,775

Project Information

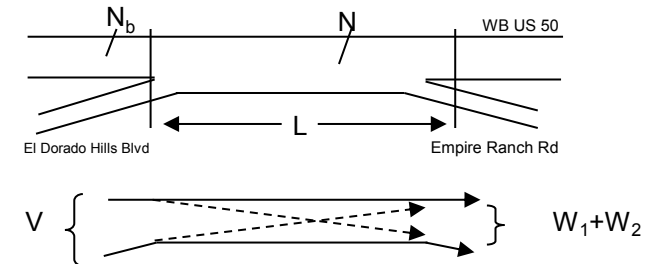
Project	Marble Valley EIR
Scenario	Cumulative No Project AM Peak Hour
Freeway	WB US 50
On-ramp	El Dorado Hills Blvd
Off-ramp	Empire Ranch Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,860	Volume (vph)*	920	Volume (vph)*	1,230
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,889	Volume (pcph)	930	Volume (pcph)	1,249

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
50 MPH and 55 MPH
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) 50.8
- Weaving Intensity Factor (k) 1.00
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,472
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

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Leisch Method for Weaving Analysis

Data Input

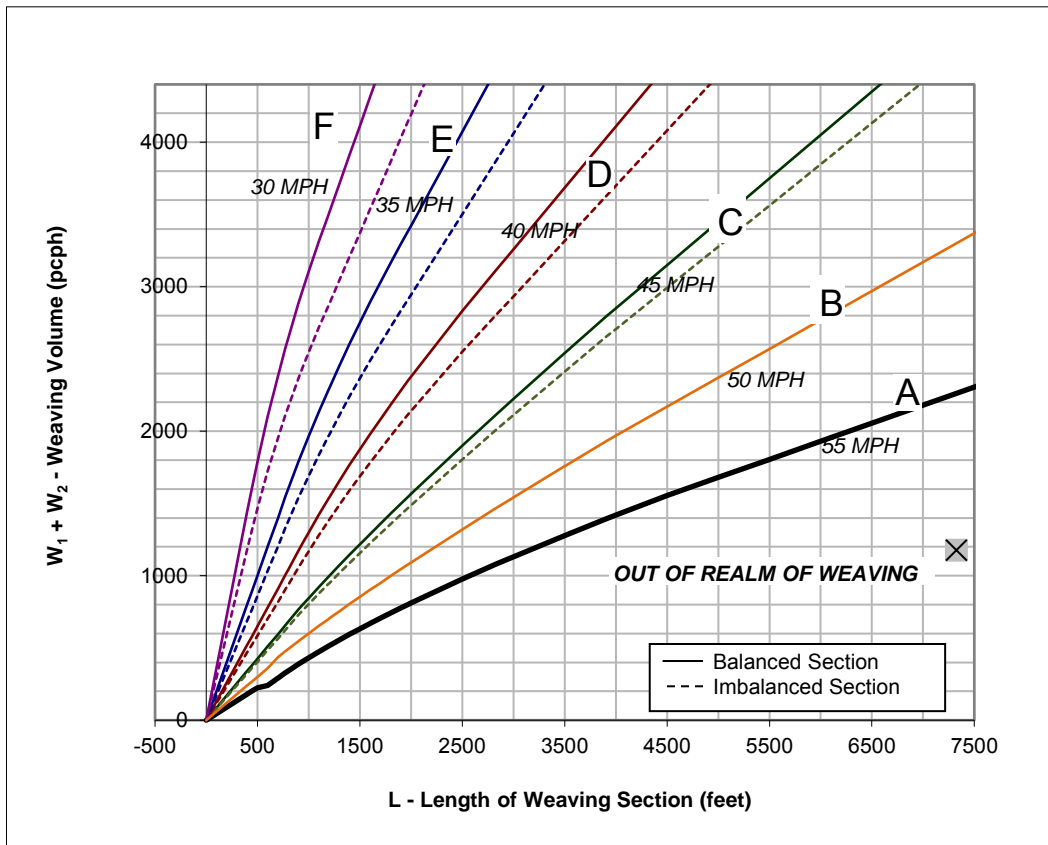
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	7,325

Project Information

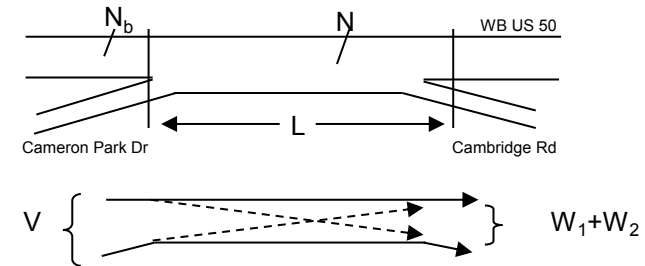
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	WB US 50
On-ramp	Cameron Park Dr
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,020	Volume (vph)*	547	Volume (vph)*	617
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,045	Volume (pcph)	553	Volume (pcph)	623

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

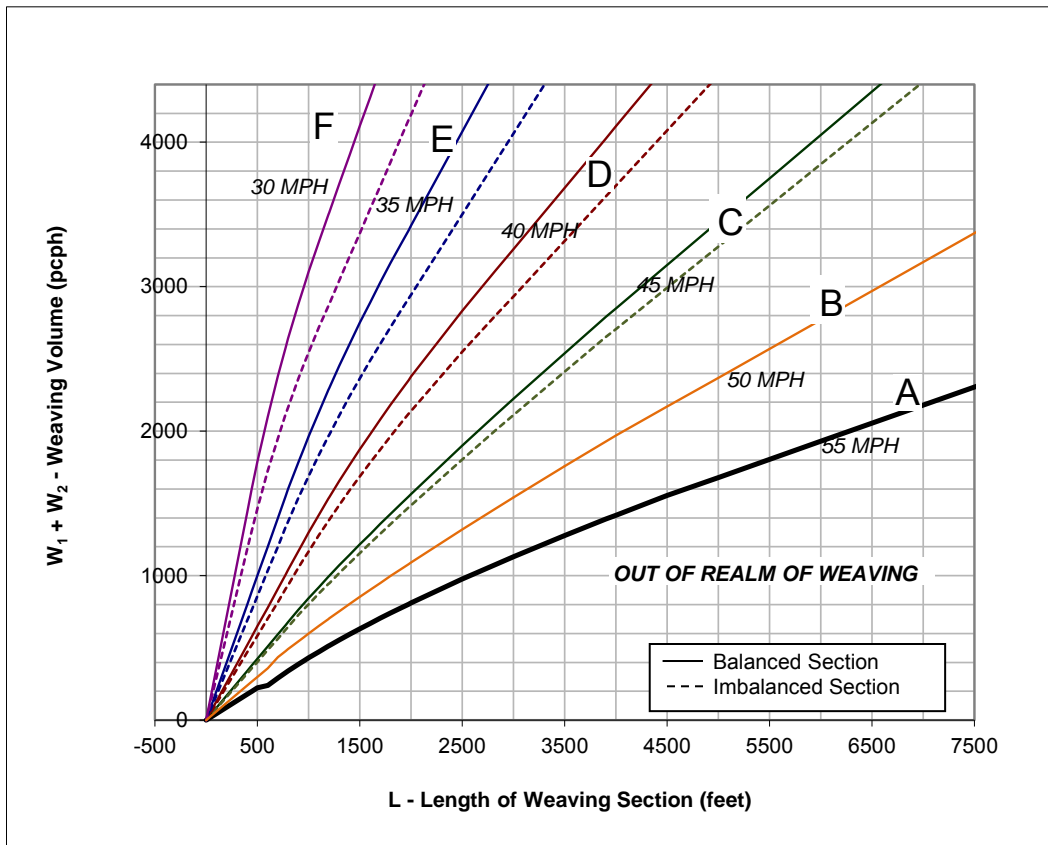
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

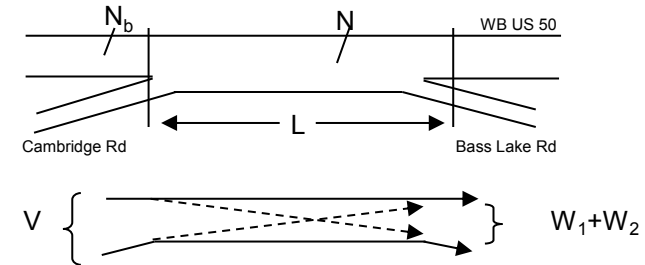
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	WB US 50
On-ramp	Cambridge Rd
Off-ramp	Bass Lake Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,470	Volume (vph)*	360	Volume (vph)*	290
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,492	Volume (pcph)	364	Volume (pcph)	293

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

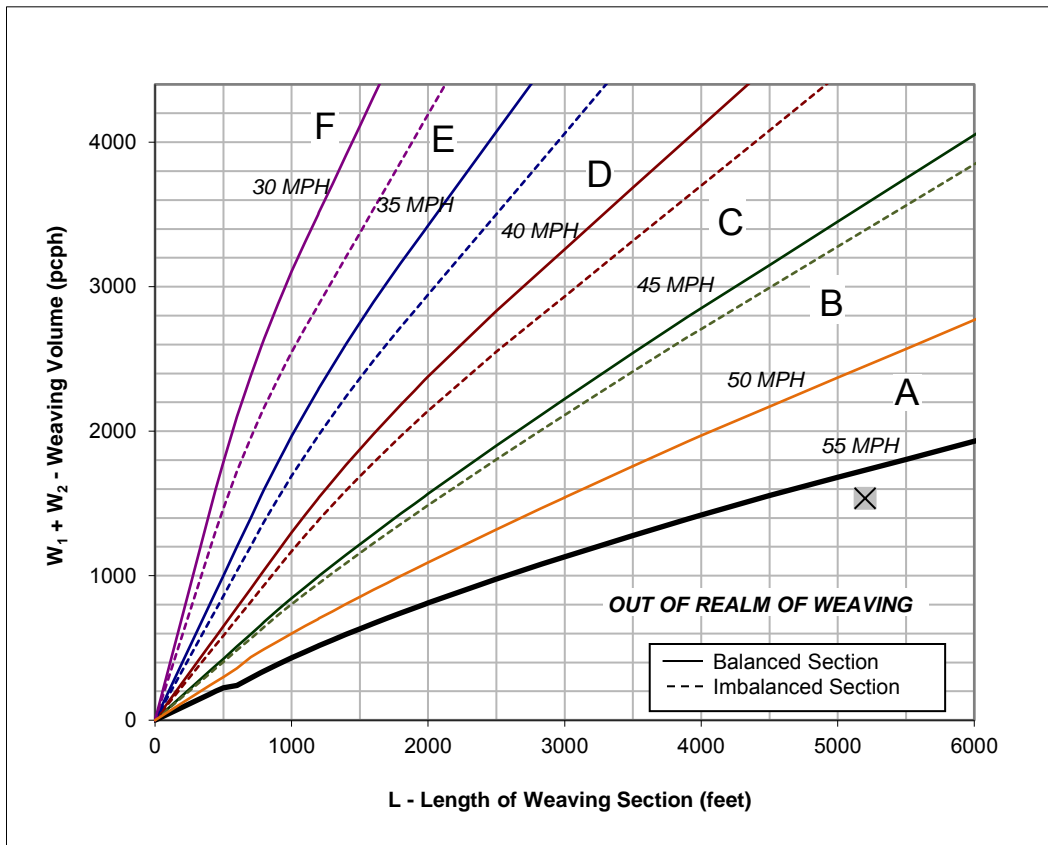
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	5,200

Project Information

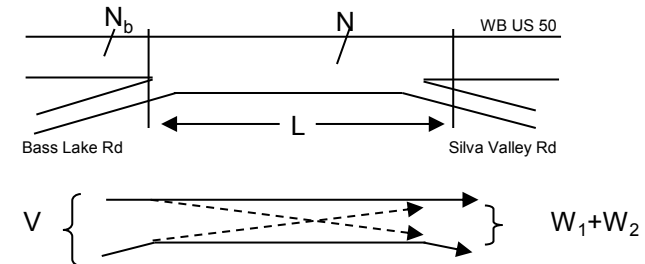
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	WB US 50
On-ramp	Bass Lake Rd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,910	Volume (vph)*	544	Volume (vph)*	974
Truck Percentage	1%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,935	Volume (pcph)	552	Volume (pcph)	984

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

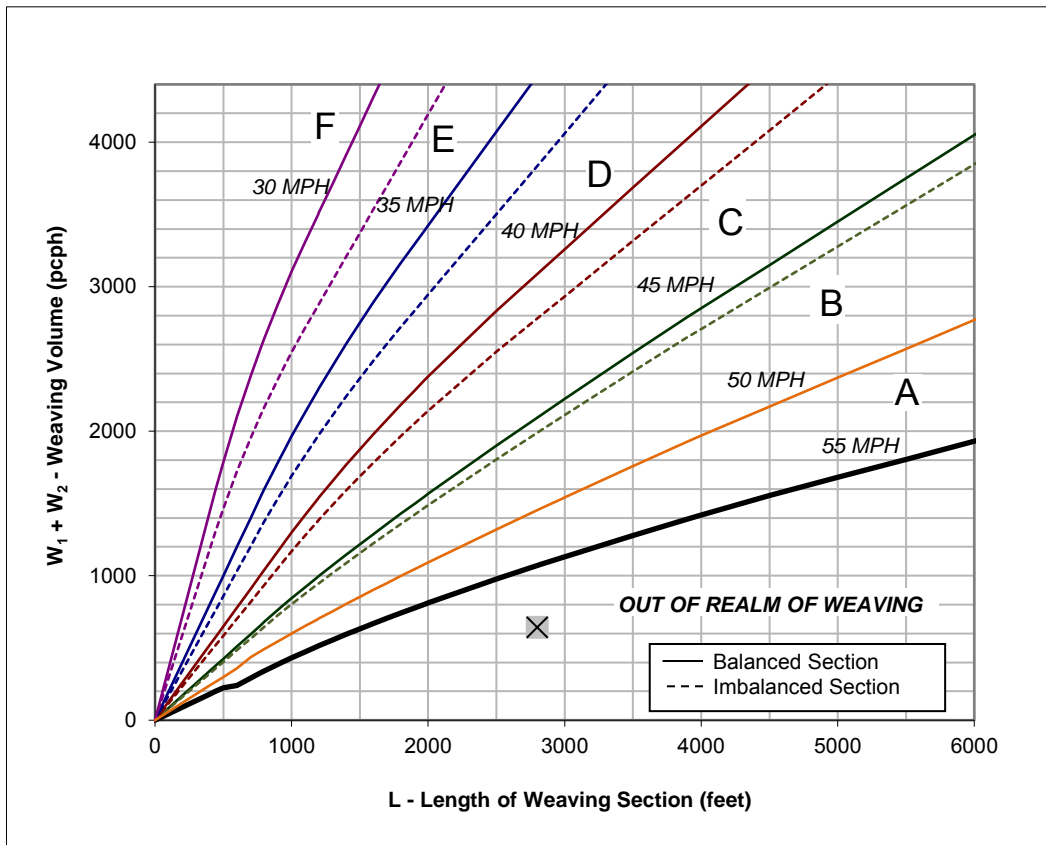
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,800

Project Information

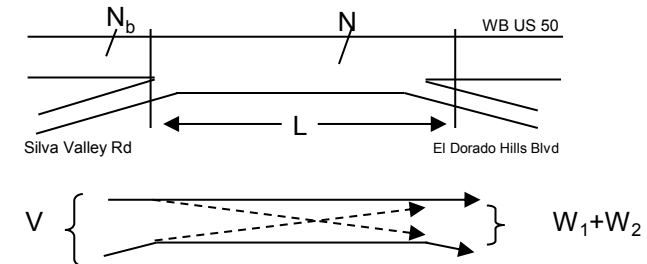
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	WB US 50
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,930	Volume (vph)*	183	Volume (vph)*	453
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,950	Volume (pcph)	184	Volume (pcph)	459

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

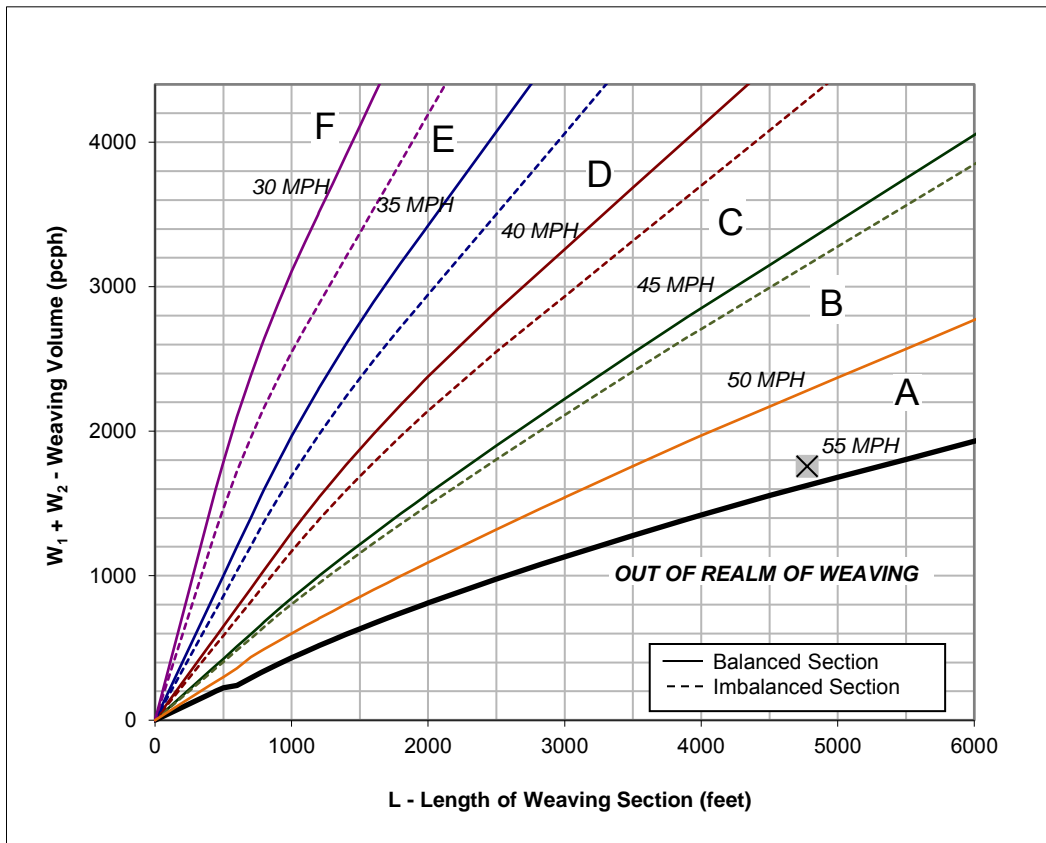
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	4,775

Project Information

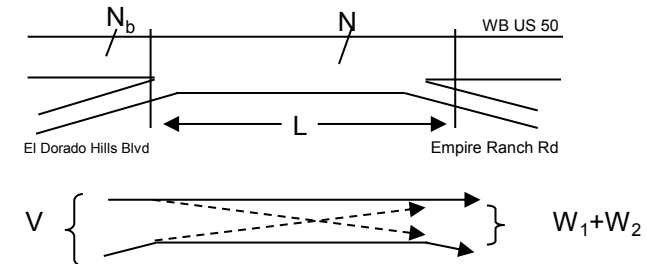
Project	Marble Valley EIR
Scenario	Cumulative No Project PM Peak Hour
Freeway	WB US 50
On-ramp	El Dorado Hills Blvd
Off-ramp	Empire Ranch Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,920	Volume (vph)*	784	Volume (vph)*	954
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,945	Volume (pcph)	792	Volume (pcph)	964

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 50 MPH and 55 MPH
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) 84.0
- Weaving Intensity Factor (k) 1.00
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,236
- Level of Service (LOS) C

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

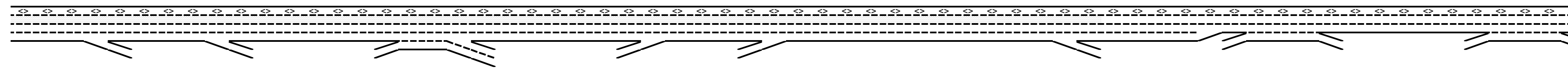
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50

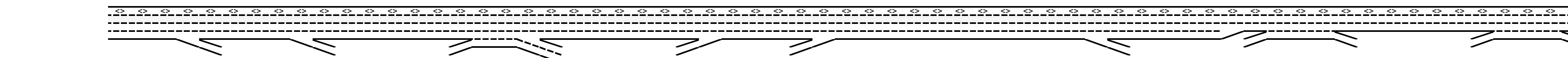
Alternative: Cumulative Plus Project
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

Location	1	2	3	4	5	6	7	8	9	10	11	12	13
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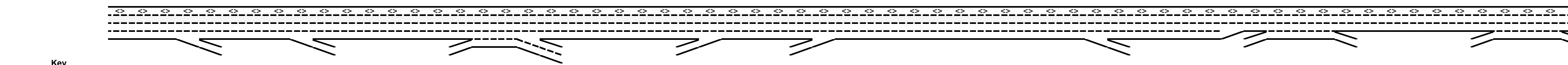
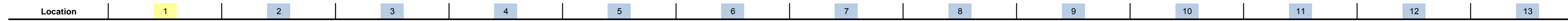


Name	Latrobe Rd off-ramp	Ei Dorado Hills Blvd off-ramp	Ei Dorado Hills Blvd off to on-ramp	Ei Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Define Freeway Segment													
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Merge	Basic	Diverge	Basic	Weave	Basic	Weave
Length (ft)	1,500	850	1,975	3,000	1,575	800	1,500	2,125	1,500	2,100	6,625	1,350	8,250
Accel Length						550	150						
Decel Length	150	150							150				
Mainline Volume	4,160	3,010	2,820	2,820	3,140	3,140	3,440	3,830	3,830	3,000	3,000	2,960	2,960
On Ramp Volume				530		300	390				320		1,190
Off Ramp Volume	1,150	190		210					830		360		1,130
Express Lane Volume	458	331	310	310	440	440	482	536	536	420	390	385	385
EL On Ramp Volume													
EL Off Ramp Volume													
Calculate Flow Rate in General Purpose Lanes (GP)													
GP Volume (vph)	3,702	2,679	2,510	3,040	2,700	3,000	3,348	3,294	3,294	2,580	2,930	2,575	3,765
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
GP Lanes	3	3	3	4	3	3	3	3	3	3	3	2	3
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	5.0	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.980	0.980	0.980	0.980	0.980	0.980	0.980	0.862	0.980	0.980	0.980	0.980	0.980
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	4,105	2,970	2,783	3,370	2,994	3,327	3,712	4,153	3,652	2,860	3,248	2,855	4,174
GP Flow (pcphpl)	1,368	990	928	843	998	1,109	1,237	1,384	1,217	953	1,083	1,428	1,391
Calculate Speed in General Purpose Lanes													
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes													
v/c ratio	0.58	0.42	0.39	0.36	0.42	0.47	0.53	0.59	0.52	0.41	0.46	0.61	0.59
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
Density (pcphpl)	21.1	15.2	14.3	13.0	15.4	17.1	19.0	21.3	18.7	14.7	16.7	22.0	21.4
LOS	C	B	B	B	B	B	C	C	C	B	B	C	C
Calculate Operations for Entering GP Lanes													
GP _N Vol (pcph)				2,807		3,008	3,298				2,908		2,862
GP _N Cap (pcph)				7,050		7,050	7,050				4,700		4,700
GP _N v/c ratio				0.40		0.43	0.47				0.62		0.61
Calculate Operations for Exiting GP Lanes													
GP _{OUT} Vol (pcph)	2,882	2,768		3,146					2,769	2,860	2,847		2,920
GP _{OUT} Cap (pcph)	7,050	7,050		7,050					7,050	4,700	4,700		4,700
GP _{OUT} v/c ratio	0.41	0.39		0.45					0.39	0.61	0.61		0.62

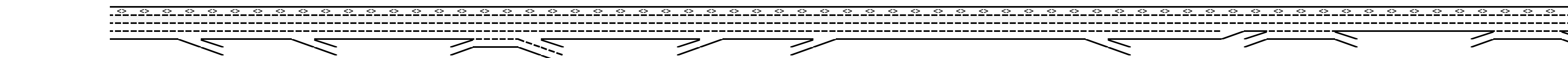
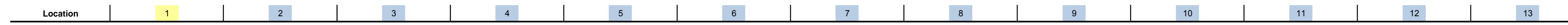


Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Flow Rate in Express Lanes (EL)													
EL Volume (vph)	458	331	310	310	440	440	482	536	536	420	390	385	385
PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990
f _P	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	544	393	369	369	522	522	572	688	637	499	463	457	457
EL Flow (pcphpl)	544	393	369	369	522	522	572	688	637	499	463	457	457
Calculate Speed in Express Lanes													
Lane Width (ft)													
Shoulder Width													
TRD													
f _{LW}													
f _{LC}													
Calc'd FFS													
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes													
EL _N v/c ratio	0.31	0.22	0.21	0.21	0.30	0.30	0.33	0.39	0.36	0.29	0.26	0.26	0.26
Calculate On Ramp Flow Rate													
On Volume (vph)				530		300	390					320	1,190
PHF				0.95		0.95	0.95					0.95	0.92
Total Lanes				1		1	1					1	1
Terrain				Level		Level	Level					Level	Level
Grade %				0.0%		0.0%	0.0%					0.0%	0.0%
Grade Length (mi)				0.00		0.00	0.00					0.00	0.00
Truck & Bus %				2.0%		2.0%	2.0%					2.0%	3.0%
RV %				0.0%		0.0%	0.0%					0.0%	0.0%
E _T				1.5		1.5	1.5					1.5	1.5
E _R				1.2		1.2	1.2					1.2	1.2
f _{HV}				0.990		0.990	0.990					0.990	0.985
f _P				1.00		1.00	1.00					1.00	1.00
On Flow (pcph)				563		319	415					340	1,313
On Flow (pcphpl)				563		319	415					340	1,313
Calculate On Ramp Roadway Operations													
On Ramp Type				Right		Right	Right					Right	Right
On Ramp Speed (mph)				45		25	45					45	25
On Ramp Cap (pcph)				2,100		1,900	2,100					2,100	1,900
On Ramp v/c ratio				0.27		0.17	0.20					0.16	0.69

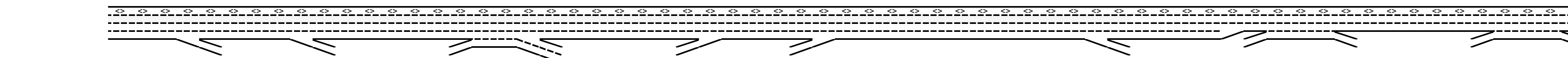
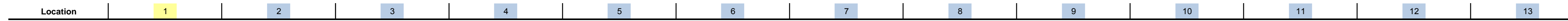


Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Off Ramp Flow Rate													
Off Volume (vph)	1,150	190		210					830		360		1,130
PHF	0.95	0.95		0.95					0.95		0.91		0.91
Total Lanes	1	1		2					1		1		1
Terrain	Level	Level		Level					Level		Level		Level
Grade %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
Grade Length (mi)	0.00	0.00		0.00					0.00		0.00		0.00
Truck & Bus %	2.0%	2.0%		3.0%					2.0%		3.0%		2.0%
RV %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
E _T	1.5	1.5		1.5					1.5		1.5		1.5
E _R	1.2	1.2		1.2					1.2		1.2		1.2
f _{HV}	0.990	0.990		0.985					0.990		0.985		0.990
f _p	1.00	1.00		1.00					1.00		1.00		1.00
Off Flow (pcph)	1,223	202		224					882		402		1,254
Off Flow (pcphpl)	1,223	202		112					882		402		1,254
Calculate Off Ramp Roadway Operations													
Off Ramp Type	Right	Right		Right					Right		Right		Right
Off Ramp Speed	45	25		45					45		45		45
Off Ramp Cap (pcph)	2,100	1,900		4,200					2,100		2,100		2,100
Off Ramp v/c ratio	0.58	0.11		0.05					0.42		0.19		0.60
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps													
Up Type		Off				No	On		No		Off		Off
Up Distance		2,350					800				2,100		1,350
Up Flow (pcph)		1,223					319				882		402
Down Type	Off	On				On	On		On		On		No
Down Distance	850	1,975				2,900	1,500		2,100		1,350		
Down Flow (pcph)	202	563				340	340		340		1,313		
Calculate Merge Influence Area Operations													
Effective v _s (pcph)						3,008	3,298						
Up Ramp L _{EQ}							812						
Down Ramp L _{EQ}						2,020	2,708						
P _{FM} (Eqn 13-3)						0.593	0.582						
P _{FM} (Eqn 13-4)		#VALUE!									#VALUE!		#VALUE!
P _{FM} (Eqn 13-5)	0.611												
P _{FM}						0.593	0.582						
v ₁₂ (pcph)						1,783	1,918						
v ₃ (pcph)						1,224	1,379						
v ₃₄ (pcph)													
v _{12a} (pcph)						1,783	1,918						
v _{R12a} (pcph)						2,102	2,333						
Merge Speed Index						0.33	0.35						
Merge Area Speed						57.5	57.0						
Outer Lanes Volume						1,224	1,379						
Outer Lanes Speed						62.4	61.8						
Segment Speed						59.2	58.7						
Merge v/c ratio						0.46	0.51						
Merge Density						18.3	22.5						
Merge LOS						B	C						



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Diverge Influence Area Operations													
Effective v_p (pcph)	4,105	2,970							3,652				
Up Ramp L_{EQ}		9,863											
Down Ramp L_{EQ}	356	575							481				
P_{FD} (Eqn 13-9)	0.601	0.676							0.628				
P_{FD} (Eqn 13-10)													
P_{FD} (Eqn 13-11)	0.559												
P_{FD}	0.601	0.676							0.628				
v_{12} (pcph)	2,955	2,074							2,622				
v_3 (pcph)	1,150	896							1,030				
v_{34} (pcph)													
v_{12a} (pcph)	2,955	2,074							2,622				
Diverge Speed Index	0.41	0.58							0.38				
Diverge Area Speed	55.6	51.7							56.3				
Outer Lanes Volume	1,150	896							1,030				
Outer Lanes Speed	70.7	71.3							71.2				
Segment Speed	59.2	56.4							59.8				
Diverge v/c ratio	0.67	0.47							0.60				
Diverge Density	28.3	20.7							25.5				
Diverge LOS	D	C							C				
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments													
On to Off Volume (vph)				50							10		460
PHF				0.92							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				4.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E_T				1.5							1.5		1.5
E_R				1.2							1.2		1.2
f_{HV}				0.980							0.990		0.985
f_p				1.00							1.00		1.00
On to Off Flow (pcph)				55							11		508
Calculate On Ramp to Mainline Flow Rate for Weave Segments													
On to ML Volume (vph)				480							310		730
PHF				0.95							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				2.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E_T				1.5							1.5		1.5
E_R				1.2							1.2		1.2
f_{HV}				0.990							0.990		0.985
f_p				1.00							1.00		1.00
On to ML Flow (pcph)				510							330		805
Calculate Mainline to Off Ramp Flow Rate for Weave Segments													
ML to Off Volume (vph)				160							350		670
PHF				0.95							0.91		0.91
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				3.0%							3.0%		2.0%
RV %				0.0%							0.0%		0.0%
E_T				1.5							1.5		1.5
E_R				1.2							1.2		1.2
f_{HV}				0.985							0.985		0.990
f_p				1.00							1.00		1.00
ML to Off Flow (pcph)				171							390		744



Key
 <-> Express Lane (HOV)
 No Trucks

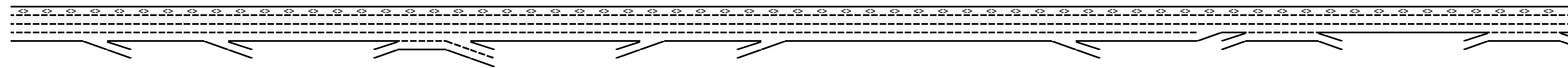
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments													
GP to GP Volume (vph)				2,350							2,260		1,905
PHF				0.92							0.92		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				4.0%							4.0%		4.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.980							0.980		0.980
f _P				1.00							1.00		1.00
GP to GP Flow (pcph)				2,605							2,506		2,112
Calculate Weave Segment Operations													
Weave Type				One-sided							One-sided		One-sided
Weave Length				2,000							5,625		7,250
Segment Lanes				3							2		2
Weave Lanes				2							2		2
Weave Flow (pcph)				681							720		1,549
Non-Weave Flow				2,661							2,516		2,620
Segment Flow				3,342							3,236		4,169
Max Weave Length				4,576							4,767		6,364
Length Check				OK							Not a Weave		Not a Weave
Ideal Weave Capacity				2,153							2,416		2,418
f _{HV}				0.982							0.982		0.984
f _P				0.998							0.999		0.997
Capacity Condition 1				6,334							4,739		4,743
Capacity Condition 2				11,545							10,583		6,335
Weave v/c ratio				0.52							0.67		0.86
Interchange Density				2							2		2
Lane Changes On to ML				1							1		1
Lane Changes ML to Off				0							1		1
Lane Changes On to Off				0							0		0
Min Lane Change Rate				510							720		1,549
Weave LC Rate				1,144							2,849		4,311
Non-Weave LC Rate 1				1,054							3,182		4,084
Non-Weave LC Rate 2				2,282							2,250		2,273
Non-Weave LC Rate 3				609							987		-2,877
Segment LC Rate				2,198							5,099		6,585
Weave Intensity Factor				0.243							0.209		0.209
Weave Speed				55.2							56.4		56.3
Non-Weave Speed				56.0							52.0		43.8
Segment Speed				55.8							52.9		47.8
Weave Density				20.0							-		-
Weave LOS				B							Basic		Basic
Summarize Segment Operations													
Segment v/c ratio	0.67	0.47	0.39	0.52	0.42	0.46	0.51	0.59	0.60	0.41	0.46	0.61	0.59
Segment Density	28.3	20.7	14.3	20.0	15.4	18.3	22.5	21.3	25.5	14.7	16.7	22.0	21.4
Segment LOS	D	C	B	B	B	B	C	C	C	B	B	C	C
Over Capacity													

Project: Marble Valley EIR
Freeway Corridor: Eastbound US 50

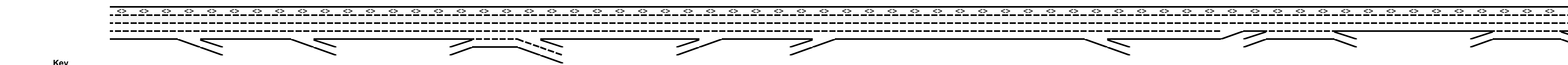
Alternative: Cumulative Plus Project
Time Period: PM Peak Hour

Data Entry Value
Calculated Value

Location	1	2	3	4	5	6	7	8	9	10	11	12	13
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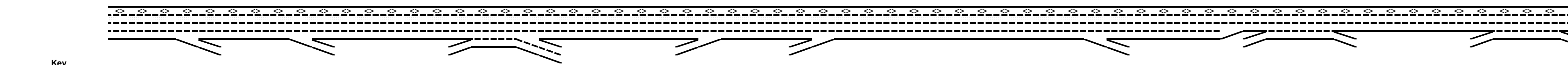


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Define Freeway Segment													
Type	Diverge	Diverge	Basic	Weave	Basic	Merge	Merge	Basic	Diverge	Basic	Weave	Basic	Weave
Length (ft)	1,500	850	1,975	3,000	1,575	800	1,500	2,125	1,500	2,100	6,625	1,350	8,250
Accel Length						550	150						
Decel Length	150	150							150				
Mainline Volume	6,030	5,330	4,610	4,610	4,810	4,810	4,990	5,590	5,590	4,120	4,120	3,720	3,720
On Ramp Volume				620		180	600				370		1,160
Off Ramp Volume	700	720		420					1,470		770		1,710
Express Lane Volume	905	800	692	599	625	625	649	839	839	618	618	558	521
EL On Ramp Volume													
EL Off Ramp Volume													
Calculate Flow Rate in General Purpose Lanes (GP)													
GP Volume (vph)	5,126	4,531	3,919	4,631	4,185	4,365	4,941	4,752	4,752	3,502	3,872	3,162	4,359
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
GP Lanes	3	3	3	4	3	3	3	3	3	3	3	2	3
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	6.0	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.952	0.995	0.995	0.995	0.995	0.995
f _P	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	5,310	4,694	4,060	4,798	4,336	4,522	5,120	5,143	4,923	3,628	4,012	3,276	4,516
GP Flow (pcphpl)	1,770	1,565	1,353	1,199	1,445	1,507	1,707	1,714	1,641	1,209	1,337	1,638	1,505
Calculate Speed in General Purpose Lanes													
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	67.3	67.3	67.3	67.3	67.3	67.3	67.3	67.3	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes													
v/c ratio	0.75	0.67	0.58	0.51	0.61	0.64	0.73	0.73	0.70	0.51	0.57	0.70	0.64
Speed (mph)	63.1	64.6	65.0	65.0	65.0	64.8	63.7	63.6	64.2	65.0	65.0	64.2	64.8
Density (pcphpl)	28.1	24.2	20.8	18.5	22.2	23.2	26.8	27.0	25.6	18.6	20.6	25.5	23.2
LOS	D	C	C	C	C	C	D	D	C	C	C	C	C
Calculate Operations for Entering GP Lanes													
GP _N Vol (pcph)				4,139		4,331	4,482				3,618		3,237
GP _N Cap (pcph)				7,050		7,050	7,050				4,700		4,700
GP _N v/c ratio				0.59		0.61	0.64				0.77		0.69
Calculate Operations for Exiting GP Lanes													
GP _{OUT} Vol (pcph)	4,566	3,928		4,349					3,392	3,628	3,162		2,619
GP _{OUT} Cap (pcph)	7,050	7,050		7,050					7,050	4,700	4,700		4,700
GP _{OUT} v/c ratio	0.65	0.56		0.62					0.48	0.77	0.67		0.56

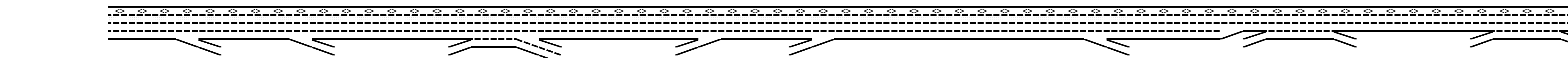
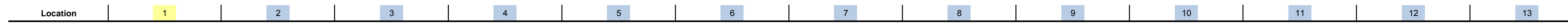


Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Flow Rate in Express Lanes (EL)													
EL Volume (vph)	905	800	692	599	625	625	649	839	839	618	618	558	521
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	5.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6.0	1.2	1.2	1.2	1.2	1.2
f _{HV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.917	0.990	0.990	0.990	0.990	0.990
f _P	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	1,015	897	776	673	702	702	728	1,016	941	694	694	626	584
EL Flow (pcphpl)	1,015	897	776	673	702	702	728	1,016	941	694	694	626	584
Calculate Speed in Express Lanes													
Lane Width (ft)													
Shoulder Width													
TRD													
f _{LW}													
f _{LC}													
Calc'd FFS													
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes													
EL _N v/c ratio	0.58	0.51	0.44	0.38	0.40	0.40	0.42	0.58	0.54	0.40	0.40	0.36	0.33
Calculate On Ramp Flow Rate													
On Volume (vph)				620		180	600				370		1,160
PHF				0.95		0.95	0.95				0.95		0.92
Total Lanes				1		1	1				1		1
Terrain				Level		Level	Level				Level		Level
Grade %				0.0%		0.0%	0.0%				0.0%		0.0%
Grade Length (mi)				0.00		0.00	0.00				0.00		0.00
Truck & Bus %				2.0%		2.0%	2.0%				2.0%		3.0%
RV %				0.0%		0.0%	0.0%				0.0%		0.0%
E _T				1.5		1.5	1.5				1.5		1.5
E _R				1.2		1.2	1.2				1.2		1.2
f _{HV}				0.990		0.990	0.990				0.990		0.985
f _P				1.00		1.00	1.00				1.00		1.00
On Flow (pcph)				659		191	638				393		1,280
On Flow (pcphpl)				659		191	638				393		1,280
Calculate On Ramp Roadway Operations													
On Ramp Type				Right		Right	Right				Right		Right
On Ramp Speed (mph)				45		25	45				45		25
On Ramp Cap (pcph)				2,100		1,900	2,100				2,100		1,900
On Ramp v/c ratio				0.31		0.10	0.30				0.19		0.67

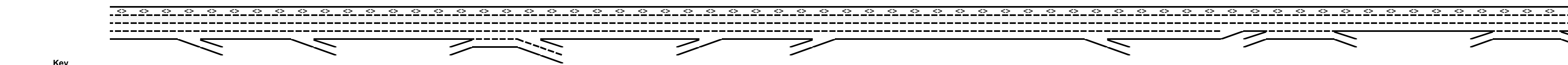


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Calculate Off Ramp Flow Rate													
Off Volume (vph)	700	720		420					1,470		770		1,710
PHF	0.95	0.95		0.95					0.97		0.92		0.91
Total Lanes	1	1		2					1		1		1
Terrain	Level	Level		Level					Level		Level		Level
Grade %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
Grade Length (mi)	0.00	0.00		0.00					0.00		0.00		0.00
Truck & Bus %	2.0%	2.0%		3.0%					2.0%		3.0%		2.0%
RV %	0.0%	0.0%		0.0%					0.0%		0.0%		0.0%
E _T	1.5	1.5		1.5					1.5		1.5		1.5
E _R	1.2	1.2		1.2					1.2		1.2		1.2
f _{HV}	0.990	0.990		0.985					0.990		0.985		0.990
f _p	1.00	1.00		1.00					1.00		1.00		1.00
Off Flow (pcph)	744	765		449					1,531		850		1,898
Off Flow (pcphpl)	744	765		224					1,531		850		1,898
Calculate Off Ramp Roadway Operations													
Off Ramp Type	Right	Right		Right					Right		Right		Right
Off Ramp Speed	45	25		45					45		45		45
Off Ramp Cap (pcph)	2,100	1,900		4,200					2,100		2,100		2,100
Off Ramp v/c ratio	0.35	0.40		0.11					0.73		0.40		0.90
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps													
Calculate Merge Influence Area Operations													



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loopon-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate Diverge Influence Area Operations													
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments													
On to Off Volume (vph)				419							162		551
PHF				0.95							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				2.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.990							0.990		0.985
f _P				1.00							1.00		1.00
On to Off Flow (pcph)				445							172		608
Calculate On Ramp to Mainline Flow Rate for Weave Segments													
On to ML Volume (vph)				201							208		609
PHF				0.95							0.95		0.92
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				2.0%							2.0%		3.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.990							0.990		0.985
f _P				1.00							1.00		1.00
On to ML Flow (pcph)				214							221		672
Calculate Mainline to Off Ramp Flow Rate for Weave Segments													
ML to Off Volume (vph)				1							608		1,159
PHF				0.95							0.92		0.91
Terrain				Level							Level		Level
Grade %				0.0%							0.0%		0.0%
Grade Length (mi)				0.00							0.00		0.00
Truck & Bus %				3.0%							3.0%		2.0%
RV %				0.0%							0.0%		0.0%
E _T				1.5							1.5		1.5
E _R				1.2							1.2		1.2
f _{HV}				0.985							0.985		0.990
f _P				1.00							1.00		1.00
ML to Off Flow (pcph)				1							671		1,286



Key
 <-> Express Lane (HOV)
 No Trucks

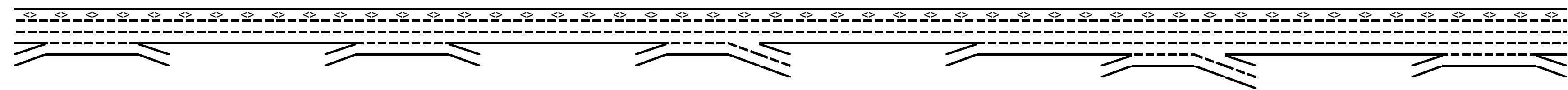
Name	Latrobe Rd off-ramp	El Dorado Hills Blvd off-ramp	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy loop-on-ramp	Silva Valley Pkwy on-ramp	Silva Valley Pkwy to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd to Cambridge Rd	Cambridge Rd off to on-ramp	Cambridge Rd to Cameron Park
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments													
GP to GP Volume (vph)				4,010							2,894		2,040
PHF				0.97							0.97		0.97
Terrain				Grade							Level		Level
Grade %				3.0%							0.0%		0.0%
Grade Length (mi)				0.41							0.00		0.00
Truck & Bus %				1.0%							1.0%		1.0%
RV %				0.0%							0.0%		0.0%
E _T				2.0							1.5		1.5
E _R				2.5							1.2		1.2
f _{HV}				0.990							0.995		0.995
f _P				1.00							1.00		1.00
GP to GP Flow (pcph)				4,175							2,998		2,114
Calculate Weave Segment Operations													
Weave Type				One-sided							One-sided		One-sided
Weave Length				2,000							5,625		7,250
Segment Lanes				3							2		2
Weave Lanes				2					3		2		2
Weave Flow (pcph)				215							892		1,958
Non-Weave Flow				4,621							3,171		2,722
Segment Flow				4,835							4,063		4,680
Max Weave Length				3,008							4,737		6,889
Length Check				OK							Not a Weave		Not a Weave
Ideal Weave Capacity				2,273							2,418		2,378
f _{HV}				0.990							0.993		0.991
f _P				1.000							0.999		0.998
Capacity Condition 1				6,748							4,799		4,702
Capacity Condition 2				53,476							10,849		5,672
Weave v/c ratio				0.71							0.84		0.98
Interchange Density				3							2		2
Lane Changes On to ML				1							1		1
Lane Changes ML to Off				0							1		1
Lane Changes On to Off				0							0		0
Min Lane Change Rate				214							892		1,958
Weave LC Rate				809							3,021		4,721
Non-Weave LC Rate 1				1,458							3,317		4,105
Non-Weave LC Rate 2				2,719							2,396		2,296
Non-Weave LC Rate 3				4,315							106		-3,261
Segment LC Rate				3,529							5,417		7,017
Weave Intensity Factor				0.354							0.219		0.220
Weave Speed				51.9							56.0		56.0
Non-Weave Speed				55.7							48.8		39.7
Segment Speed				55.5							50.2		45.2
Weave Density				29.0							-		-
Weave LOS				D							Basic		Basic
Summarize Segment Operations													
Segment v/c ratio	0.81	0.72	0.58	0.71	0.61	0.60	0.71	0.73	0.78	0.51	0.57	0.70	0.64
Segment Density	33.5	30.0	20.8	29.0	22.2	23.5	29.6	27.0	32.6	18.6	20.6	25.5	23.2
Segment LOS	D	D	C	D	C	C	D	D	D	C	C	C	C
Over Capacity													

Project: Marble Valley EIR
Freeway Corridor: Westbound US 50

Alternative: Cumulative Plus Project
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

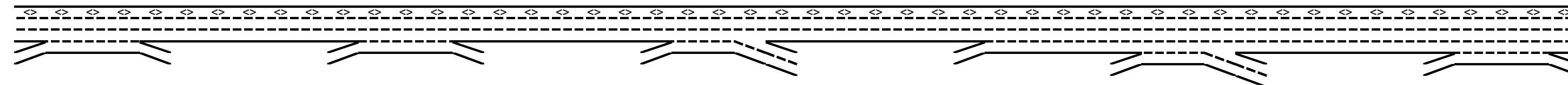
Location	1	2	3	4	5	6	7	8	9	10
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Key
 <-> Express Lane (HOV)
 No Trucks

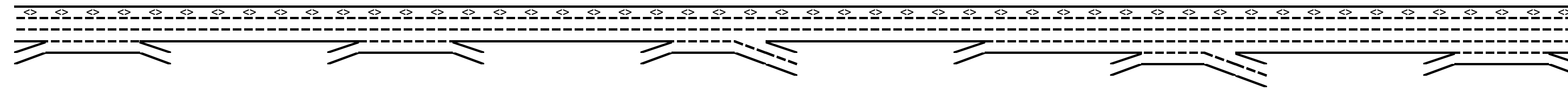
Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Define Freeway Segment										
Type	Weave	Basic	Weave	Basic	Weave	Basic	Basic	Weave	Basic	Weave
Length (ft)	7,325	1,250	8,250	2,350	6,500	2,350	800	2,800	2,300	4,775
Accel Length										
Decel Length										
Mainline Volume	3,410	3,410	3,410	3,910	3,910	4,200	4,200	4,280	4,560	4,560
On Ramp Volume	930		780		1,530		80	890		1,530
Off Ramp Volume	930		280		1,240			610		1,870
Express Lane Volume	512	512	546	626	626	672	672	642	821	821
EL On Ramp Volume										
EL Off Ramp Volume										
Calculate Flow Rate in General Purpose Lanes (GP)										
GP Volume (vph)	3,829	2,899	3,644	3,284	4,814	3,528	3,608	4,528	3,739	5,269
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
GP Lanes	3	2	3	2	3	2	4	4	3	4
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	4,093	3,099	3,896	3,512	5,147	3,772	3,857	4,841	3,998	5,634
GP Flow (pcphpl)	1,364	1,549	1,299	1,756	1,716	1,886	964	1,210	1,333	1,408
Calculate Speed in General Purpose Lanes										
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes										
v/c ratio	0.58	0.66	0.55	0.75	0.73	0.80	0.41	0.52	0.57	0.60
Speed (mph)	65.0	64.7	65.0	63.2	63.6	61.7	65.0	65.0	65.0	65.0
Density (pcphpl)	21.0	24.0	20.0	27.8	27.0	30.6	14.8	18.6	20.5	21.7
LOS	C	C	C	D	D	D	B	C	C	C
Calculate Operations for Entering GP Lanes										
GP _{IN} Vol (pcph)	3,072		3,076		3,513		3,772	3,895		4,007
GP _{IN} Cap (pcph)	4,700		4,700		4,700		4,700	7,050		7,050
GP _{IN} v/c ratio	0.65		0.65		0.75		0.80	0.55		0.57
Calculate Operations for Exiting GP Lanes										
GP _{OUT} Vol (pcph)	2,670		3,597		3,829			4,189		3,636
GP _{OUT} Cap (pcph)	4,700		4,700		4,700			7,050		7,050
GP _{OUT} v/c ratio	0.57		0.77		0.81			0.59		0.52

Location	1	2	3	4	5	6	7	8	9	10
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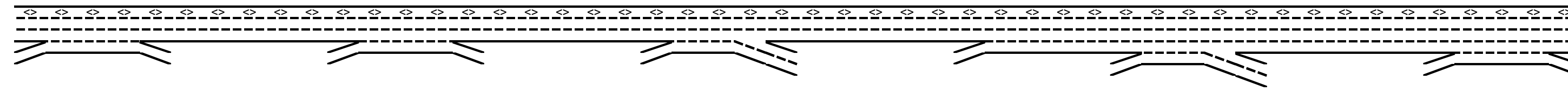
Key
 <-> Express Lane (HOV)
 - - - No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Flow Rate in Express Lanes (EL)										
EL Volume (vph)	512	512	546	626	626	672	672	642	821	821
PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Express Lanes	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	580	580	619	710	710	763	763	729	931	931
EL Flow (pcphpl)	580	580	619	710	710	763	763	729	931	931
Calculate Speed in Express Lanes										
Lane Width (ft)										
Shoulder Width										
TRD										
f _{lw}										
f _{lc}										
Calc'd FFS										
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes										
EL _v v/c ratio	0.33	0.33	0.35	0.41	0.41	0.44	0.44	0.42	0.53	0.53
Calculate On Ramp Flow Rate										
On Volume (vph)	930		780		1,530		80	890		1,530
PHF	0.92		0.96		0.95		0.95	0.95		0.95
Total Lanes	1		1		1		1	1		1
Terrain	Level		Level		Level		Level	Level		Level
Grade %	0.0%		0.0%		0.0%		0.0%	0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00		0.00	0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%		2.0%	2.0%		2.0%
RV %	0.0%		0.0%		0.0%		0.0%	0.0%		0.0%
E _T	1.5		1.5		1.5		1.5	1.5		1.5
E _R	1.2		1.2		1.2		1.2	1.2		1.2
f _{sv}	0.990		0.990		0.985		0.990	0.990		0.990
f _p	1.00		1.00		1.00		1.00	1.00		1.00
On Flow (pcph)	1,021		821		1,635		85	946		1,627
On Flow (pcphpl)	1,021		821		1,635		85	946		1,627
Calculate On Ramp Roadway Operations										
On Ramp Type	Right		Right				Right	Right		Right
On Ramp Speed (mph)	45		25				25	45		45
On Ramp Cap (pcph)	2,100		1,900				1,900	2,100		2,100
On Ramp v/c ratio	0.49		0.43				0.04	0.45		0.77



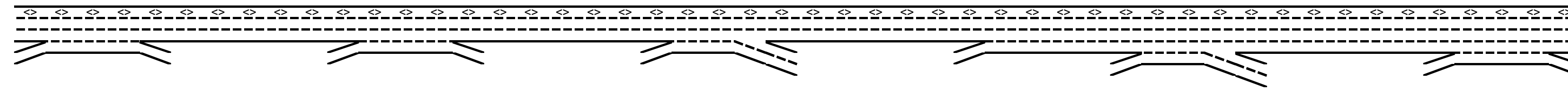
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Off Ramp Flow Rate										
Off Volume (vph)	930		280		1,240			610		1,870
PHF	0.66		0.95		0.95			0.95		0.95
Total Lanes	1		1		2			2		1
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
Off Flow (pcph)	1,423		299		1,318			652		1,998
Off Flow (pcphpl)	1,423		299		659			326		1,998
Calculate Off Ramp Roadway Operations										
Off Ramp Type	Right		Right		Right			Right		Right
Off Ramp Speed	45		45		45			25		45
Off Ramp Cap (pcph)	2,100		2,100		4,200			3,800		2,100
Off Ramp v/c ratio	0.68		0.14		0.31			0.17		0.95
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps										
Up Type			Off		Off					
Up Distance			1,250		2,350					
Up Flow (pcph)			1,423		299					
Down Type	On		No		On					
Down Distance	1,250				8,850					
Down Flow (pcph)	821				85					
Calculate Merge Influence Area Operations										



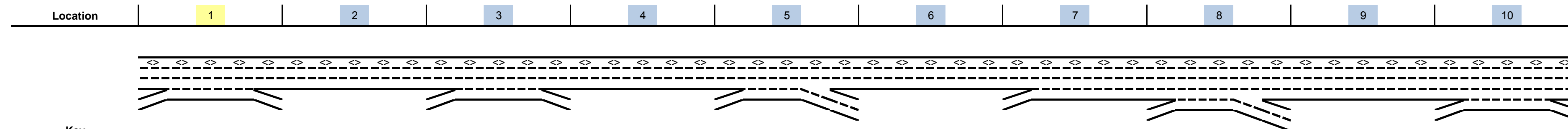
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Diverge Influence Area Operations										
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments										
On to Off Volume (vph)	228		112		785			164		830
PHF	0.92		0.96		0.95			0.95		0.95
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to Off Flow (pcph)	250		118		839			174		882
Calculate On Ramp to Mainline Flow Rate for Weave Segments										
On to ML Volume (vph)	702		668		745			726		700
PHF	0.92		0.96		0.95			0.95		0.95
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to ML Flow (pcph)	771		703		796			772		744



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Mainline to Off Ramp Flow Rate for Weave Segments										
ML to Off Volume (vph)	702		168		455			446		1,040
PHF	0.66		0.95		0.95			0.95		0.95
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{HV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
ML to Off Flow (pcph)	1,074		179		484			477		1,111
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments										
GP to GP Volume (vph)	2,197		2,696		2,829			3,192		2,699
PHF	0.94		0.94		0.94			0.94		0.94
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	1.0%		1.0%		1.0%			1.0%		1.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{HV}	0.995		0.995		0.995			0.995		0.995
f _p	1.00		1.00		1.00			1.00		1.00
GP to GP Flow (pcph)	2,348		2,883		3,025			3,413		2,886



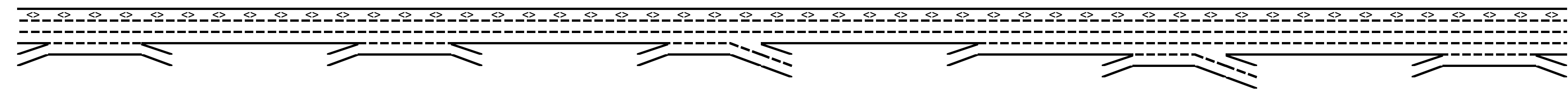
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Weave Segment Operations										
Weave Type	One-sided		One-sided		One-sided			One-sided		One-sided
Weave Length	6,325		7,250		5,500			1,800		3,775
Segment Lanes	2		2		2			3		3
Weave Lanes	2		2		3			3		3
Weave Flow (pcph)	1,845		882		1,280			1,248		1,855
Non-Weave Flow	2,599		3,001		3,864			3,587		3,768
Segment Flow	4,444		3,883		5,143			4,835		5,624
Max Weave Length	6,852		4,816		3,475			3,574		4,341
Length Check	OK		Not a Weave		Not a Weave			OK		OK
Ideal Weave Capacity	2,310		2,536		2,505			2,214		2,307
f_{wv}	0.993		0.994		0.991			0.993		0.992
f_p	0.998		0.998		0.998			0.998		0.999
Capacity Condition 1	4,578		5,030		4,956			6,587		6,853
Capacity Condition 2	5,728		10,475		13,915			13,442		10,506
Weave v/c ratio	0.96		0.77		1.03			0.73		0.81
Interchange Density	3		5		5			4		3
Lane Changes On to ML	1		1		1			1		1
Lane Changes ML to Off	1		1		1			1		1
Lane Changes On to Off	0		0		0			0		0
Min Lane Change Rate	1,845		882		1,280			1,248		1,855
Weave LC Rate	4,230		3,596		3,311			1,730		3,143
Non-Weave LC Rate 1	3,578		4,162		3,392			1,137		2,245
Non-Weave LC Rate 2	2,269		2,358		2,551			2,489		2,529
Non-Weave LC Rate 3	-3,738		-22,423		-8,675			3,805		3,545
Segment LC Rate	6,498		5,955		5,862			4,219		5,673
Weave Intensity Factor	0.231		0.193		0.238			0.443		0.312
Weave Speed	55.6		56.9		55.4			49.7		53.1
Non-Weave Speed	41.1		49.3		43.4			48.3		42.6
Segment Speed	46.1		50.9		45.9			48.6		45.6
Weave Density	48.2		-		-			33.1		41.1
Weave LOS	E		Basic		Basic			D		E
Summarize Segment Operations										
Segment v/c ratio	0.96	0.66	0.55	0.75	0.73	0.80	0.41	0.73	0.57	0.81
Segment Density	48.2	24.0	20.0	27.8	27.0	30.6	14.8	33.1	20.5	41.1
Segment LOS	E	C	C	D	D	D	B	D	C	E
Over Capacity										

Project: **Marble Valley EIR**
Freeway Corridor: **Westbound US 50**
Alternative: **Cumulative Plus Project**
Time Period: **PM Peak Hour**

Data Entry Value
Calculated Value

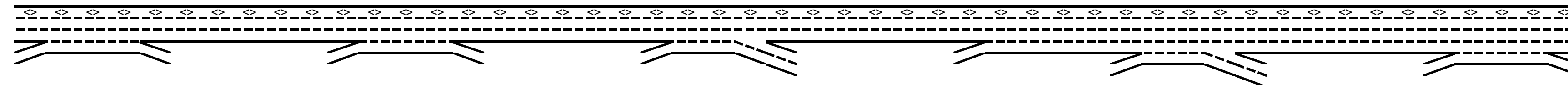
Location	1	2	3	4	5	6	7	8	9	10
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Key
 <-> Express Lane (HOV)
 No Trucks

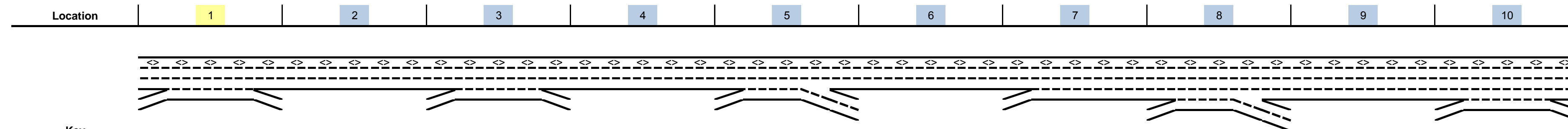
Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Define Freeway Segment										
Type	Weave	Basic	Weave	Basic	Weave	Basic	Basic	Weave	Basic	Weave
Length (ft)	7,325	1,250	8,250	2,350	6,500	2,350	800	2,800	2,300	4,775
Accel Length										
Decel Length										
Mainline Volume	4,060	3,740	3,740	3,780	3,780	3,580	3,580	3,660	3,355	3,355
On Ramp Volume	1,020		560		1,170		80	240		1,480
Off Ramp Volume	1,340		520		1,370			545		1,690
Express Lane Volume	609	561	636	643	567	537	501	512	470	470
EL On Ramp Volume										
EL Off Ramp Volume										
Calculate Flow Rate in General Purpose Lanes (GP)										
GP Volume (vph)	4,471	3,179	3,664	3,137	4,383	3,043	3,159	3,388	2,885	4,365
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
GP Lanes	3	2	3	2	3	2	4	4	3	4
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	4,681	3,328	3,836	3,284	4,588	3,186	3,307	3,546	3,021	4,570
GP Flow (pcphpl)	1,560	1,664	1,279	1,642	1,529	1,593	827	887	1,007	1,142
Calculate Speed in General Purpose Lanes										
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes										
v/c ratio	0.66	0.71	0.54	0.70	0.65	0.68	0.35	0.38	0.43	0.49
Speed (mph)	64.6	64.0	65.0	64.2	64.8	64.5	65.0	65.0	65.0	65.0
Density (pcphpl)	24.1	26.0	19.7	25.6	23.6	24.7	12.7	13.6	15.5	17.6
LOS	C	C	C	C	C	C	B	B	B	B
Calculate Operations for Entering GP Lanes										
GP _{IN} Vol (pcph)	3,536		3,208		3,351		3,222	3,291		2,996
GP _{IN} Cap (pcph)	4,700		4,700		4,700		4,700	7,050		7,050
GP _{IN} v/c ratio	0.75		0.68		0.71		0.69	0.47		0.43
Calculate Operations for Exiting GP Lanes										
GP _{OUT} Vol (pcph)	3,160		3,280		3,132			2,964		2,764
GP _{OUT} Cap (pcph)	4,700		4,700		4,700			7,050		7,050
GP _{OUT} v/c ratio	0.67		0.70		0.67			0.42		0.39

Location	1	2	3	4	5	6	7	8	9	10
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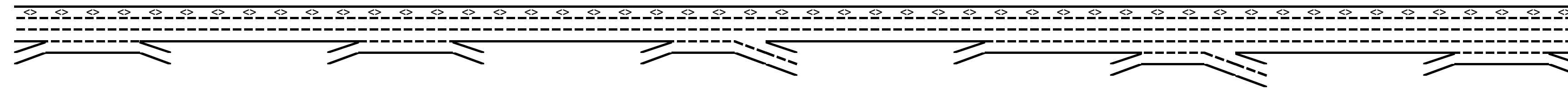
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Flow Rate in Express Lanes (EL)										
EL Volume (vph)	609	561	636	643	567	537	501	512	470	470
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Grade	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	-7.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	683	630	714	721	636	603	562	575	527	527
EL Flow (pcphpl)	683	630	714	721	636	603	562	575	527	527
Calculate Speed in Express Lanes										
Lane Width (ft)										
Shoulder Width										
TRD										
f _{LW}										
f _{LC}										
Calc'd FFS										
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes										
EL _{ex} v/c ratio	0.39	0.36	0.41	0.41	0.36	0.34	0.32	0.33	0.30	0.30
Calculate On Ramp Flow Rate										
On Volume (vph)	1,020		560		1,170		80		240	
PHF	0.9		0.9		0.96		0.95		0.95	
Total Lanes	1		1		1		1		1	
Terrain	Level		Level		Level		Level		Level	
Grade %	0.0%		0.0%		0.0%		0.0%		0.0%	
Grade Length (mi)	0.00		0.00		0.00		0.00		0.00	
Truck & Bus %	2.0%		2.0%		3.0%		2.0%		2.0%	
RV %	0.0%		0.0%		0.0%		0.0%		0.0%	
E _T	1.5		1.5		1.5		1.5		1.5	
E _R	1.2		1.2		1.2		1.2		1.2	
f _{RV}	0.990		0.990		0.985		0.990		0.990	
f _p	1.00		1.00		1.00		1.00		1.00	
On Flow (pcph)	1,145		628		1,237		85		255	
On Flow (pcphpl)	1,145		628		1,237		85		255	
Calculate On Ramp Roadway Operations										
On Ramp Type	Right		Right		Right		Right		Right	
On Ramp Speed (mph)	45		25		45		45		45	
On Ramp Cap (pcph)	2,100		1,900		2,100		2,100		2,100	
On Ramp v/c ratio	0.55		0.33		0.59		0.04		0.12	



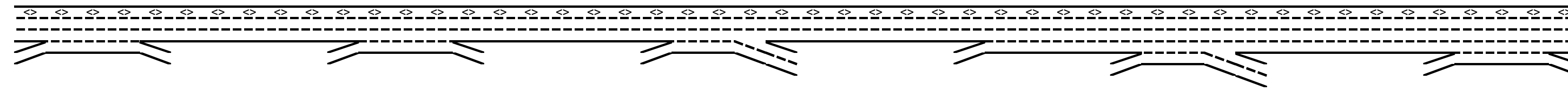
Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Off Ramp Flow Rate										
Off Volume (vph)	1,340		520		1,370			545		1,690
PHF	0.89		0.95		0.95			0.95		0.95
Total Lanes	1		1		2			2		1
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E_T	1.5		1.5		1.5			1.5		1.5
E_R	1.2		1.2		1.2			1.2		1.2
f_{HV}	0.990		0.985		0.990			0.985		0.985
f_p	1.00		1.00		1.00			1.00		1.00
Off Flow (pcph)	1,521		556		1,457			582		1,806
Off Flow (pcphpl)	1,521		556		728			291		1,806
Calculate Off Ramp Roadway Operations										
Off Ramp Type	Right		Right		Right			Right		Right
Off Ramp Speed	45		45		45			25		45
Off Ramp Cap (pcph)	2,100		2,100		4,200			3,800		2,100
Off Ramp v/c ratio	0.72		0.26		0.35			0.15		0.86
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps										
Up Type			Off		Off					
Up Distance			1,250		2,350					
Up Flow (pcph)			1,521		556					
Down Type	On		On		On					
Down Distance	1,250		2,350		8,850					
Down Flow (pcph)	628		1,237		85					
Calculate Merge Influence Area Operations										

Location	1	2	3	4	5	6	7	8	9	10
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Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Diverge Influence Area Operations										
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments										
On to Off Volume (vph)	434		150		400			83		686
PHF	0.9		0.9		0.96			0.95		0.95
Terrain	Level		Level		Level			Level		Level
Grade %	0.0%		0.0%		0.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to Off Flow (pcph)	487		168		423			88		729
Calculate On Ramp to Mainline Flow Rate for Weave Segments										
On to ML Volume (vph)	586		410		770			157		794
PHF	0.9		0.9		0.96			0.95		0.95
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		2.0%		3.0%			2.0%		2.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{RV}	0.990		0.990		0.985			0.990		0.990
f _p	1.00		1.00		1.00			1.00		1.00
On to ML Flow (pcph)	658		460		814			167		844



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 No Trucks

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Calculate Mainline to Off Ramp Flow Rate for Weave Segments										
ML to Off Volume (vph)	906		370		970			462		1,004
PHF	0.89		0.95		0.95			0.95		0.95
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	2.0%		3.0%		2.0%			3.0%		3.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{HV}	0.990		0.985		0.990			0.985		0.985
f _p	1.00		1.00		1.00			1.00		1.00
ML to Off Flow (pcph)	1,028		395		1,031			494		1,073
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments										
GP to GP Volume (vph)	2,545		2,734		2,243			2,686		1,881
PHF	0.96		0.96		0.96			0.96		0.96
Terrain	Level		Level		Grade			Level		Level
Grade %	0.0%		0.0%		-7.0%			0.0%		0.0%
Grade Length (mi)	0.00		0.00		0.00			0.00		0.00
Truck & Bus %	1.0%		1.0%		1.0%			1.0%		1.0%
RV %	0.0%		0.0%		0.0%			0.0%		0.0%
E _T	1.5		1.5		1.5			1.5		1.5
E _R	1.2		1.2		1.2			1.2		1.2
f _{HV}	0.995		0.995		0.995			0.995		0.995
f _p	1.00		1.00		1.00			1.00		1.00
GP to GP Flow (pcph)	2,664		2,862		2,348			2,811		1,969



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cameron Park to Cambridge	Cambridge Rd off to on-ramp	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off to on-ramp	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley loop on-ramp	Silva Valley to El Dorado Hills	El Dorado Hills off to on-ramp	El Dorado Hills to Empire Ranch
Calculate Weave Segment Operations										
Weave Type	One-sided		One-sided		One-sided			One-sided		One-sided
Weave Length	6,325		7,250		5,500			1,800		3,775
Segment Lanes	2		2		2			3		3
Weave Lanes	2		2		3			3		3
Weave Flow (pcph)	1,686		855		1,845			661		1,917
Non-Weave Flow	3,151		3,031		2,771			2,900		2,699
Segment Flow	4,837		3,886		4,616			3,560		4,616
Max Weave Length	6,110		4,743		5,112			2,823		5,287
Length Check	Not a Weave		Not a Weave		Not a Weave			OK		OK
Ideal Weave Capacity	2,366		2,542		2,380			2,272		2,234
f_{wv}	0.993		0.993		0.991			0.993		0.991
f_p	0.999		0.999		0.997			1.000		0.998
Capacity Condition 1	4,693		5,043		4,706			6,767		6,631
Capacity Condition 2	6,828		10,816		8,657			18,730		8,337
Weave v/c ratio	1.02		0.76		0.97			0.52		0.69
Interchange Density	3		5		5			4		3
Lane Changes On to ML	1		1		1			1		1
Lane Changes ML to Off	1		1		1			1		1
Lane Changes On to Off	0		0		0			0		0
Min Lane Change Rate	1,686		855		1,845			661		1,917
Weave LC Rate	4,071		3,570		3,877			1,142		3,205
Non-Weave LC Rate 1	3,692		4,169		3,167			995		2,024
Non-Weave LC Rate 2	2,392		2,365		2,307			2,336		2,291
Non-Weave LC Rate 3	-5,670		-22,711		-5,193			2,620		2,745
Segment LC Rate	6,462		5,934		6,184			3,478		5,496
Weave Intensity Factor	0.230		0.193		0.248			0.380		0.304
Weave Speed	55.7		56.9		55.1			51.2		53.3
Non-Weave Speed	41.3		49.5		40.6			54.5		43.8
Segment Speed	45.3		51.0		45.4			53.9		47.3
Weave Density	-		-		-			22.0		32.5
Weave LOS	Basic		Basic		Basic			C		D
Summarize Segment Operations										
Segment v/c ratio	0.66	0.71	0.54	0.70	0.65	0.68	0.35	0.52	0.43	0.69
Segment Density	24.1	26.0	19.7	25.6	23.6	24.7	12.7	22.0	15.5	32.5
Segment LOS	C	C	C	C	C	C	B	C	B	D
Over Capacity	Weave									

Leisch Method for Weaving Analysis

Data Input

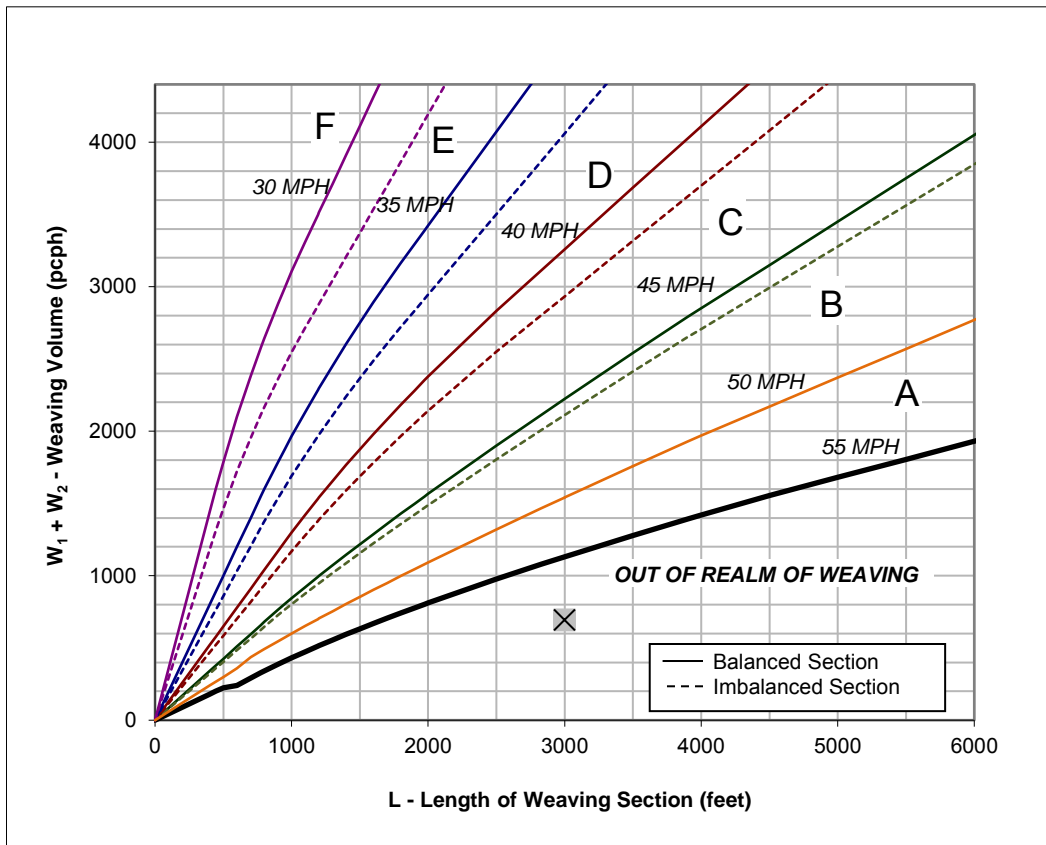
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,000

Project Information

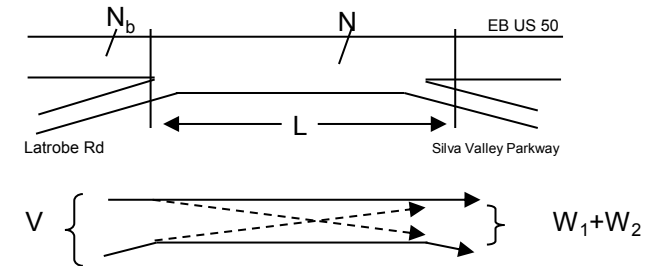
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	EB US 50
On-ramp	Latrobe Rd
Off-ramp	Silva Valley Parkway

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,350	Volume (vph)*	504	Volume (vph)*	184
Truck Percentage	4%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,417	Volume (pcph)	509	Volume (pcph)	186

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

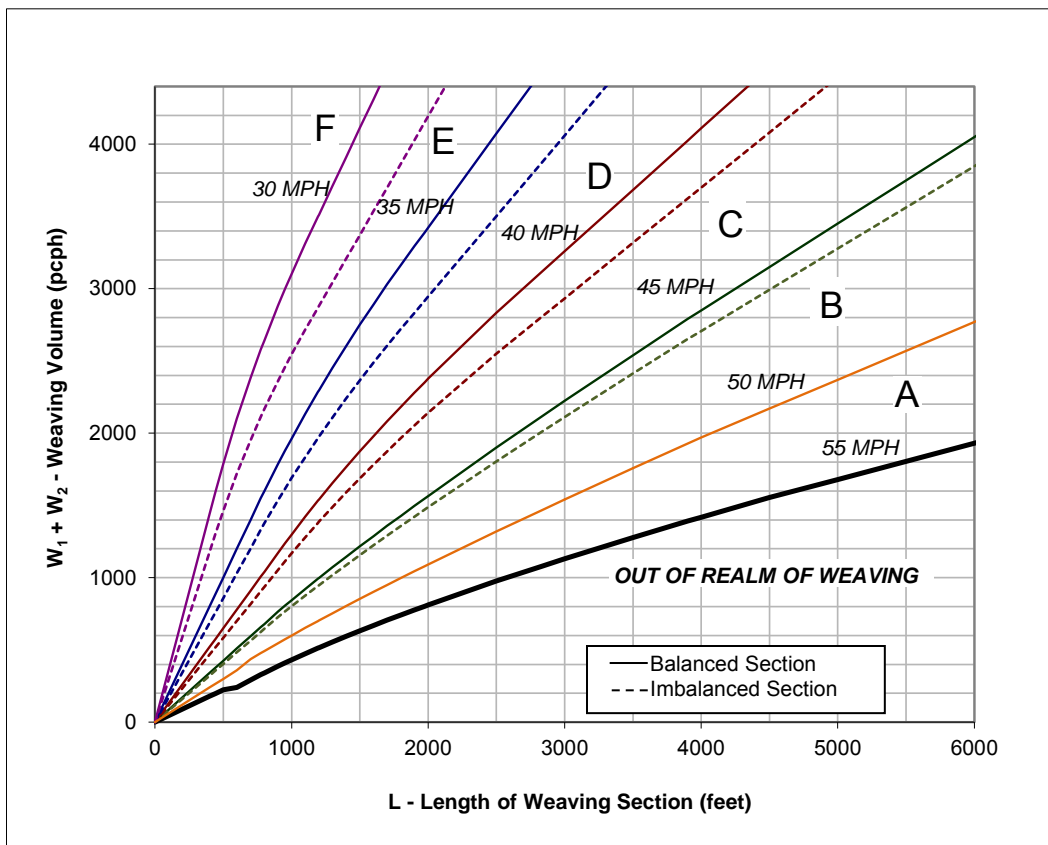
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	6,625

Project Information

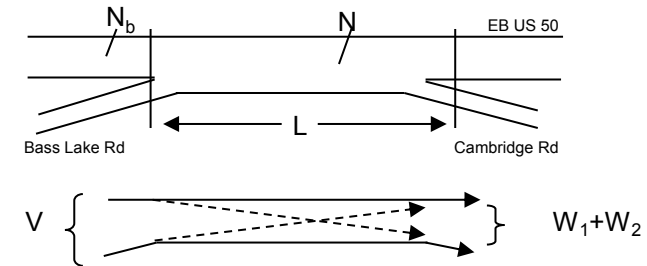
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	EB US 50
On-ramp	Bass Lake Rd
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,320	Volume (vph)*	314	Volume (vph)*	354
Truck Percentage	4%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,386	Volume (pcph)	317	Volume (pcph)	359

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

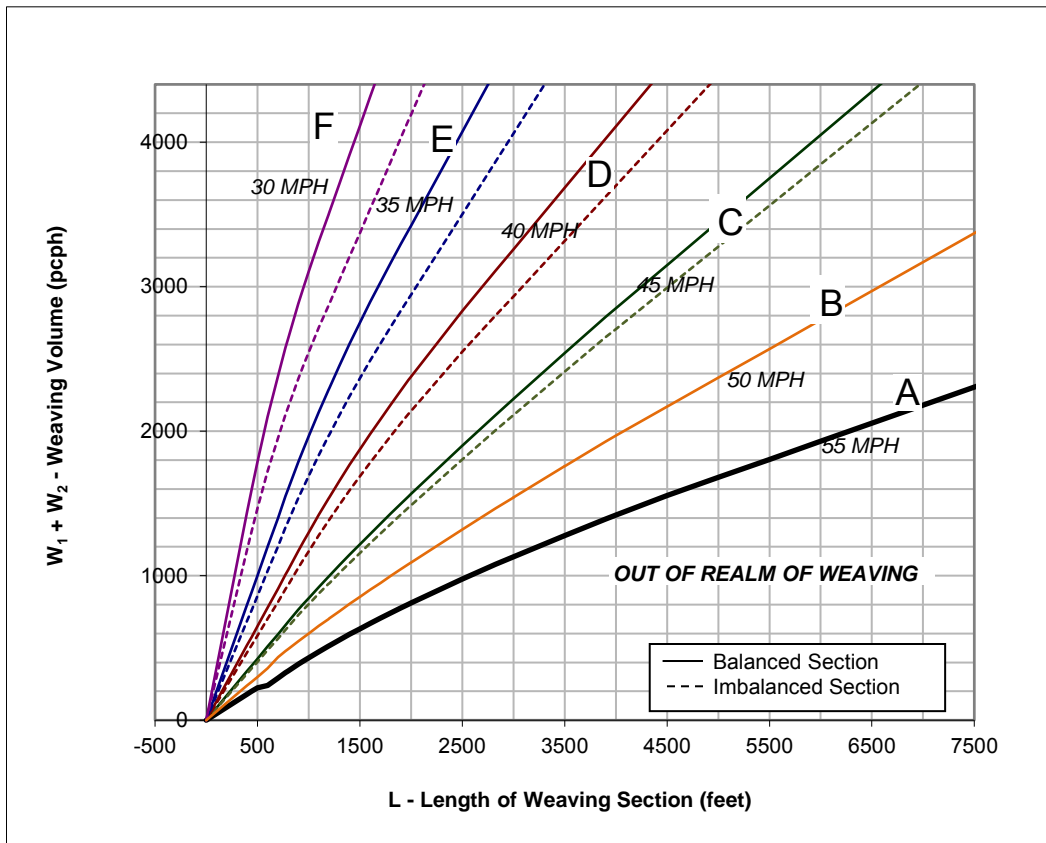
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

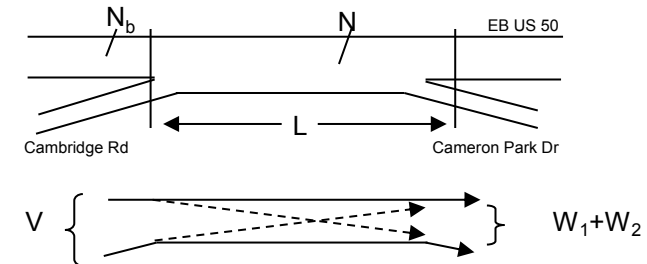
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	EB US 50
On-ramp	Cambridge Rd
Off-ramp	Cameron Park Dr

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,150	Volume (vph)*	738	Volume (vph)*	678
Truck Percentage	4%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,233	Volume (pcph)	749	Volume (pcph)	685

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

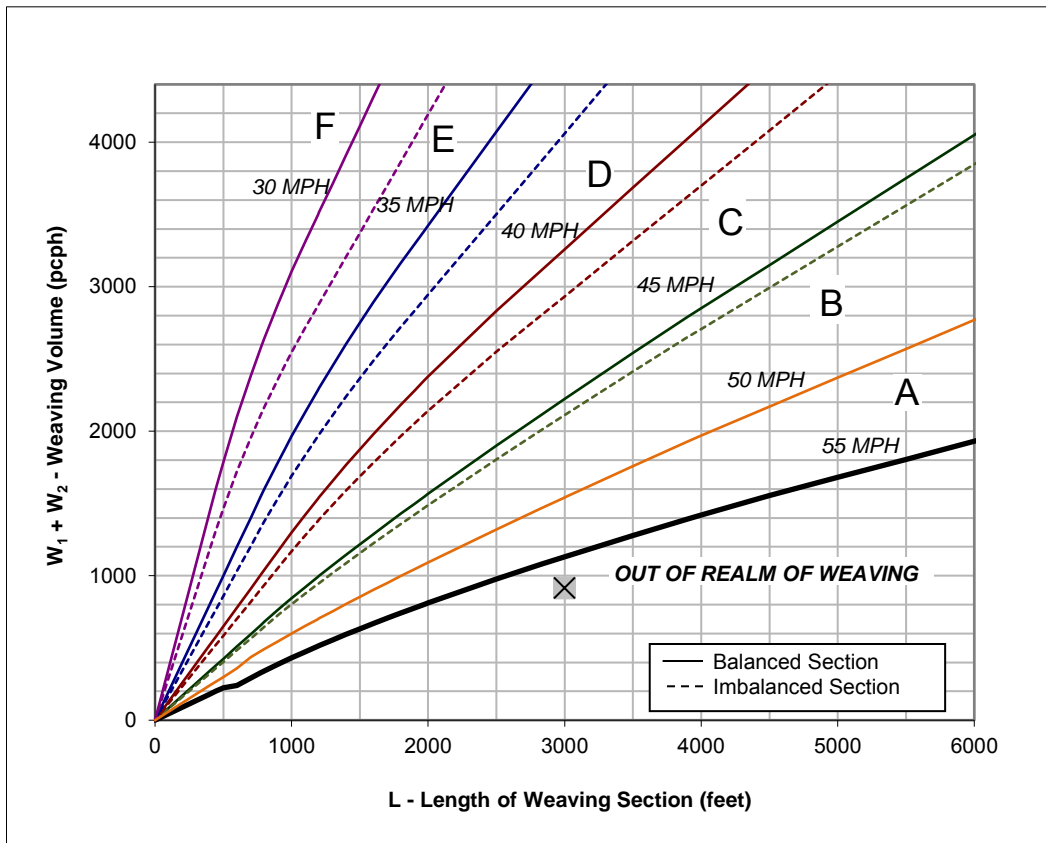
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	3,000

Project Information

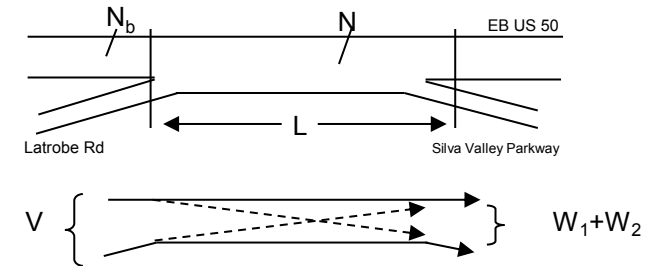
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	EB US 50
On-ramp	Latrobe Rd
Off-ramp	Silva Valley Parkway

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,230	Volume (vph)*	552	Volume (vph)*	352
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,256	Volume (pcph)	557	Volume (pcph)	357

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

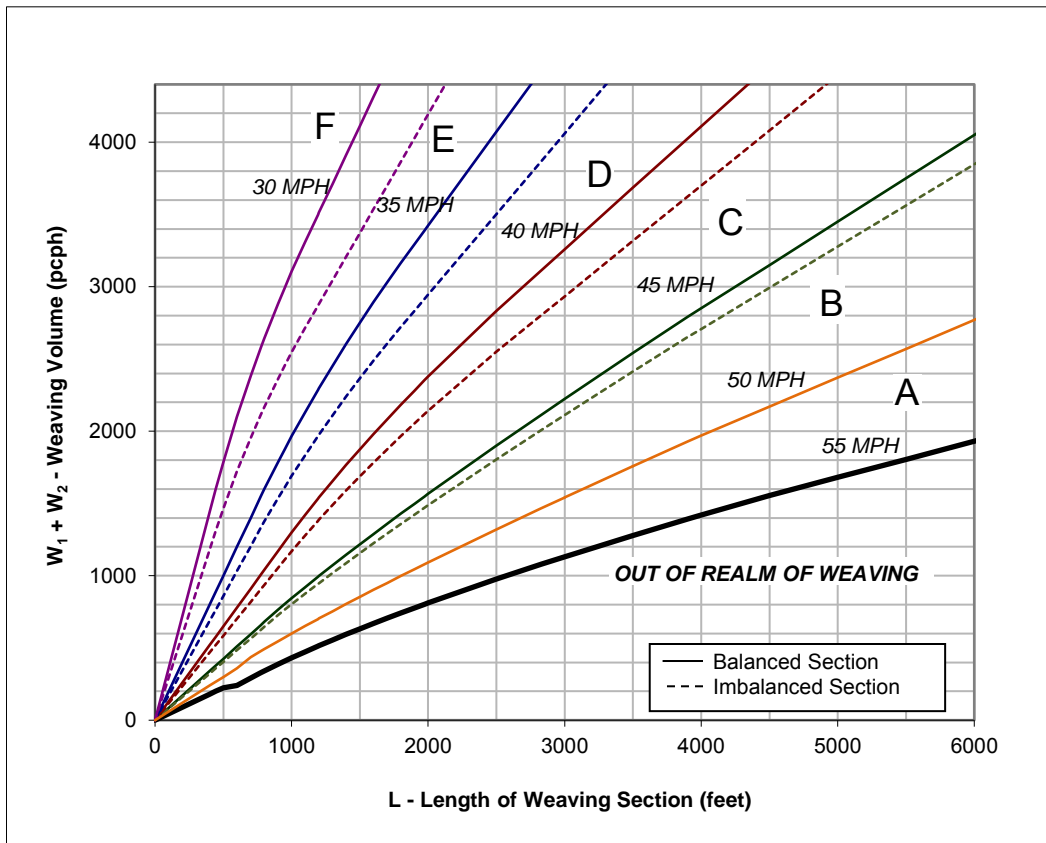
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	6,625

Project Information

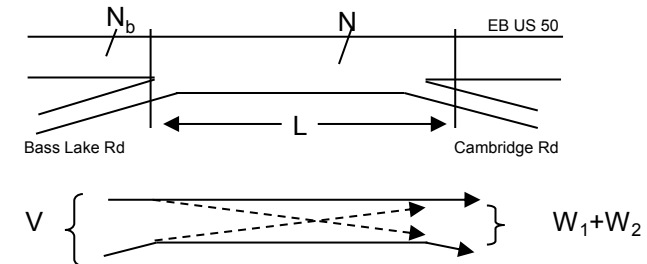
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	EB US 50
On-ramp	Bass Lake Rd
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,490	Volume (vph)*	155	Volume (vph)*	555
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,512	Volume (pcph)	157	Volume (pcph)	564

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? N
 [If optional exit lane, then "Y". Otherwise "N".]

2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?

55 MPH and -

If below the 55 MPH curve, out of the realm of weaving.
 If left of the 30 MPH curve, LOS is F.

3. Interpolated Weaving Speed (S_w , mph) -

4. Weaving Intensity Factor (k) -

5. Service Volume (SV, pcph)

$$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$$

6. Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

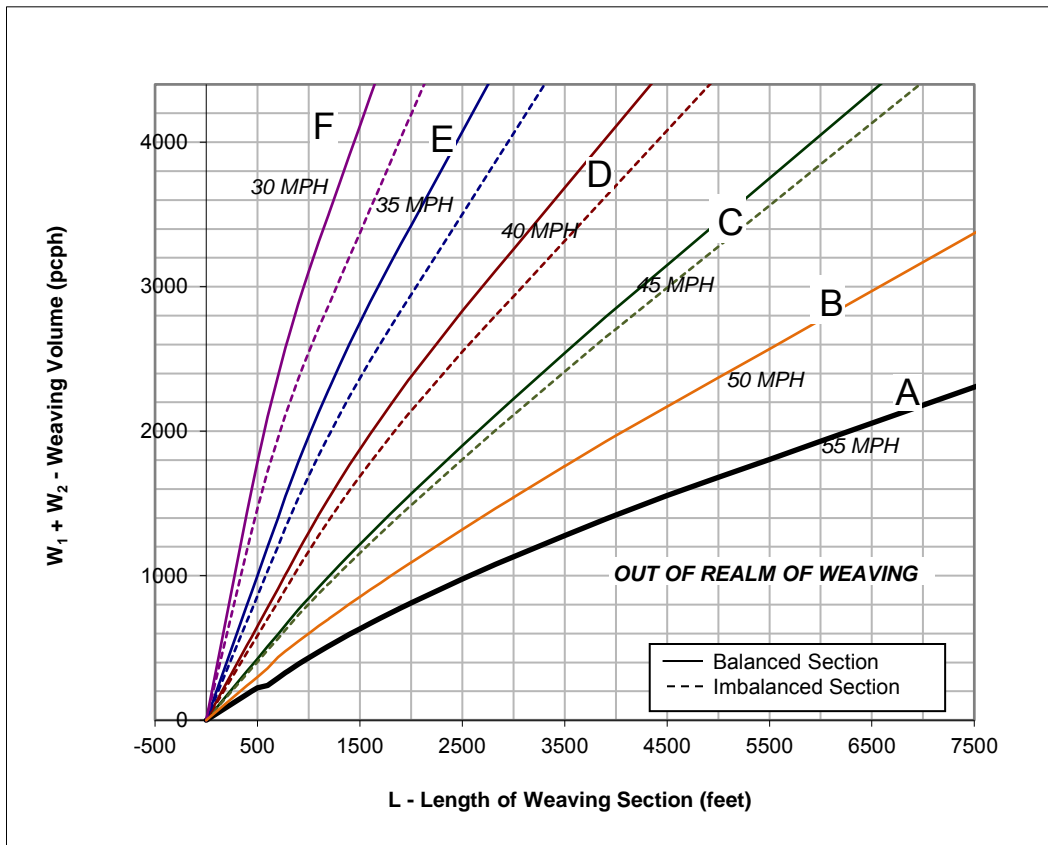
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

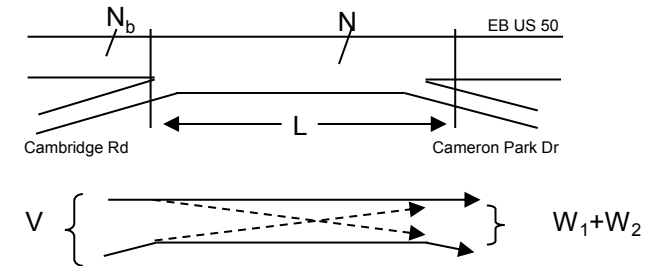
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	EB US 50
On-ramp	Cambridge Rd
Off-ramp	Cameron Park Dr

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,880	Volume (vph)*	441	Volume (vph)*	991
Truck Percentage	1%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,904	Volume (pcph)	447	Volume (pcph)	1,001

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? N
 [If optional exit lane, then "Y". Otherwise "N".]

2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?

55 MPH and -

If below the 55 MPH curve, out of the realm of weaving.
 If left of the 30 MPH curve, LOS is F.

3. Interpolated Weaving Speed (S_w , mph) -

4. Weaving Intensity Factor (k) -

5. Service Volume (SV, pcph)

$$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$$

6. Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

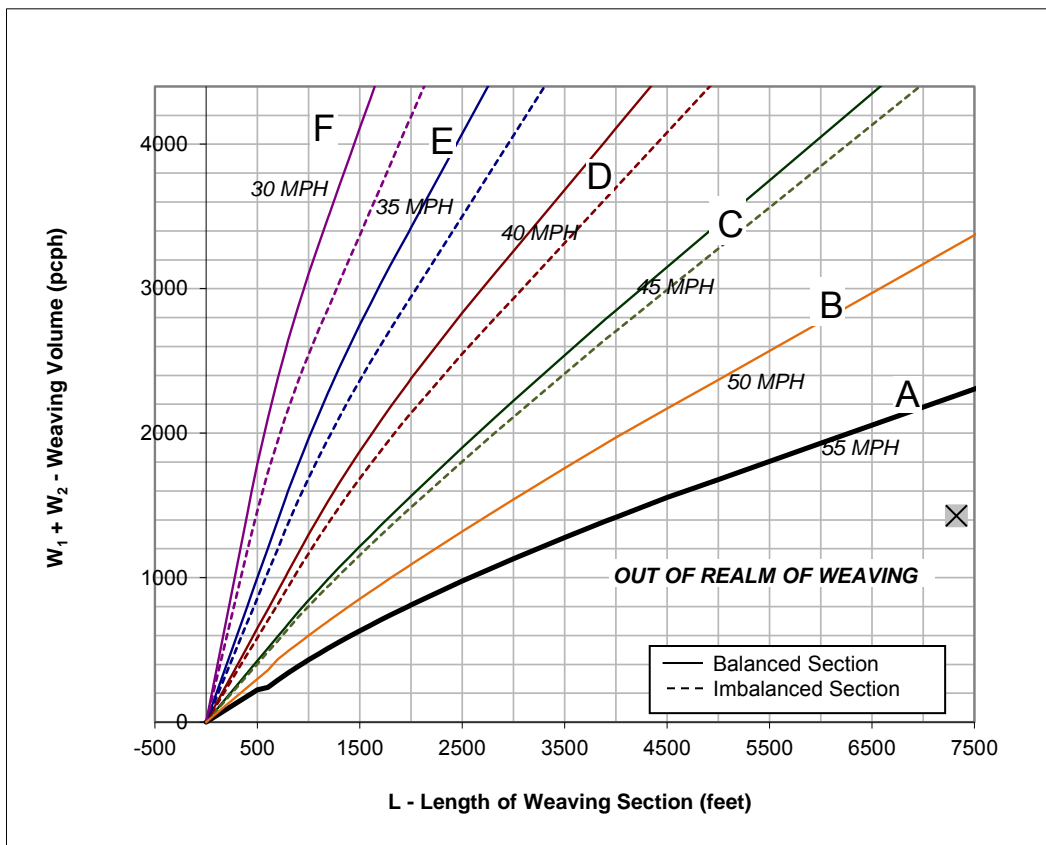
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	7,325

Project Information

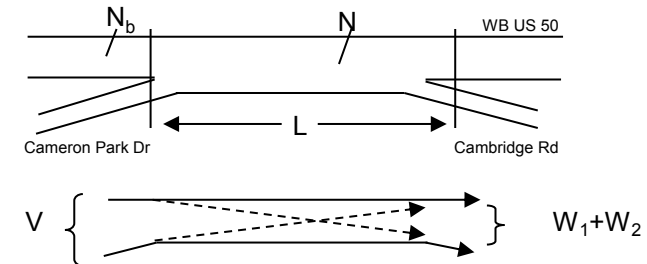
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	WB US 50
On-ramp	Cameron Park Dr
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,340	Volume (vph)*	707	Volume (vph)*	707
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,362	Volume (pcph)	714	Volume (pcph)	714

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

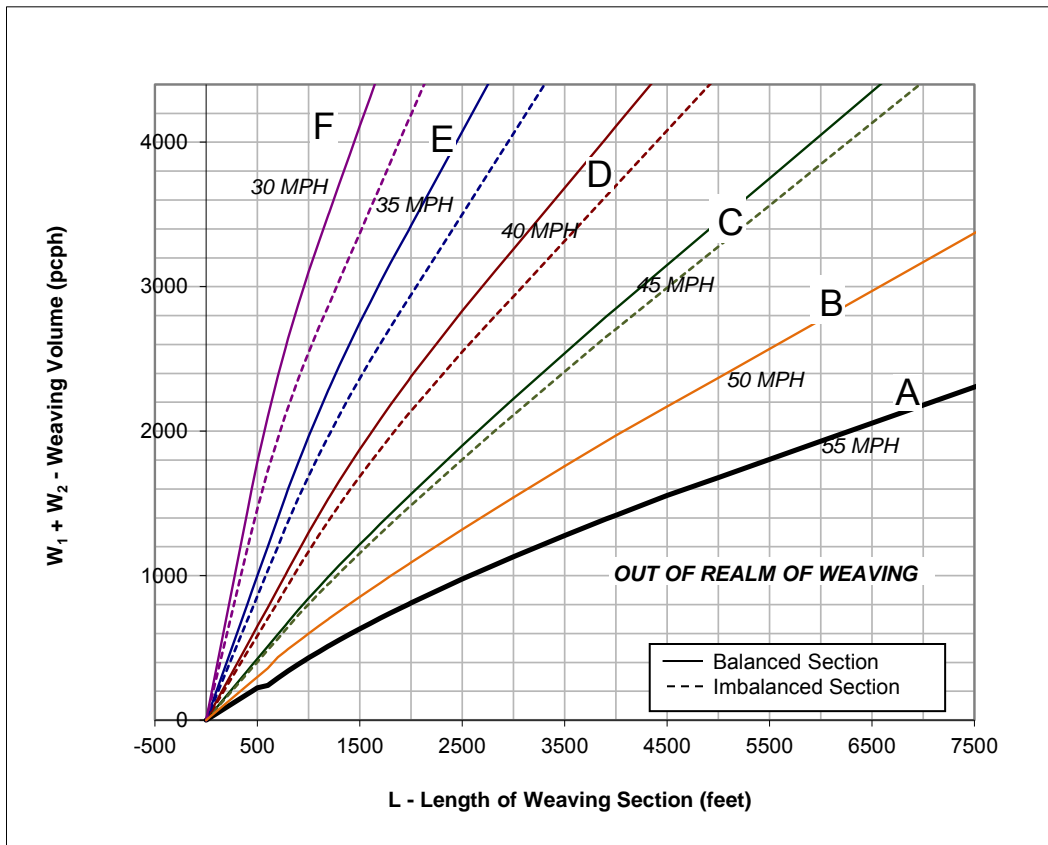
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

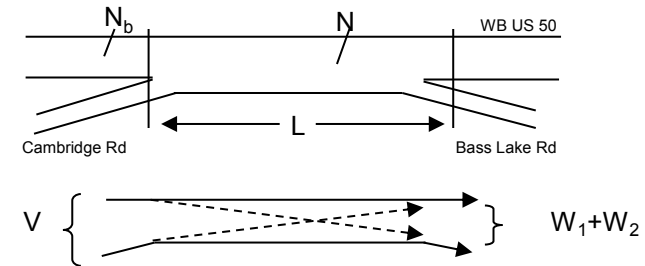
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	WB US 50
On-ramp	Cambridge Rd
Off-ramp	Bass Lake Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,190	Volume (vph)*	647	Volume (vph)*	147
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,211	Volume (pcph)	654	Volume (pcph)	150

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

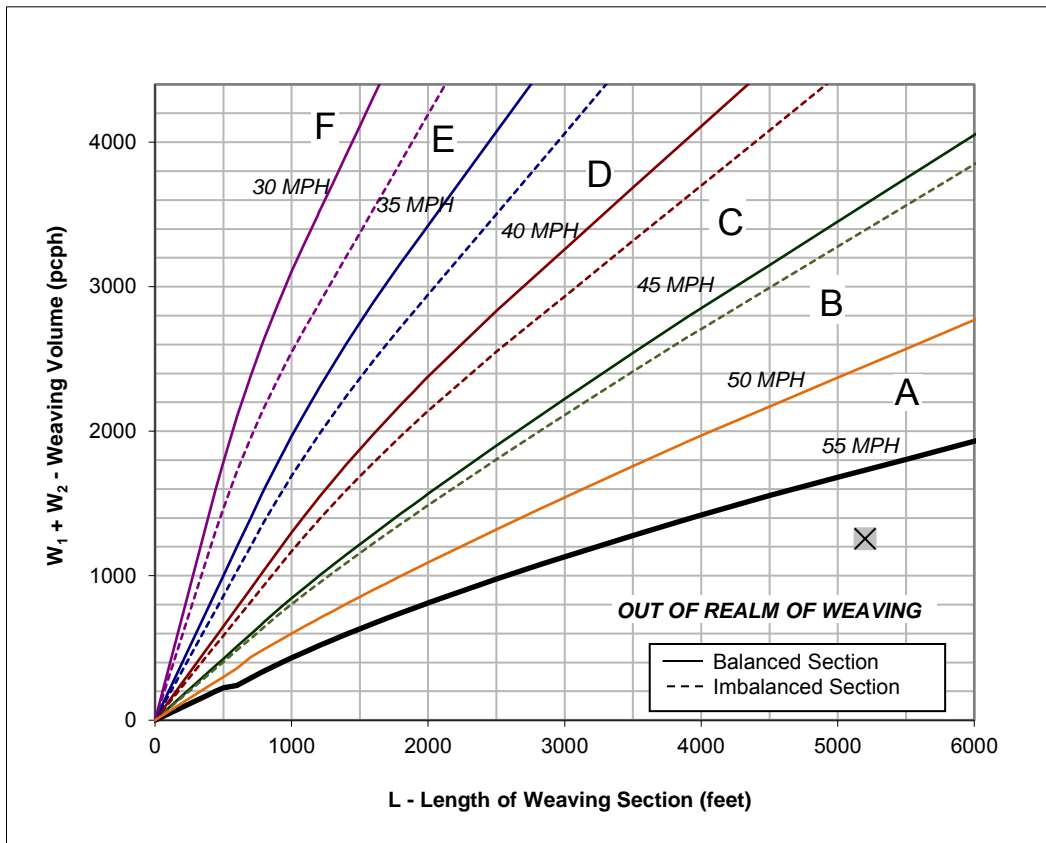
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	5,200

Project Information

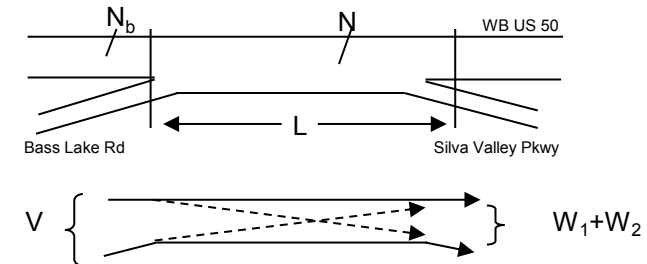
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	WB US 50
On-ramp	Bass Lake Rd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,440	Volume (vph)*	765	Volume (vph)*	475
Truck Percentage	1%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,467	Volume (pcph)	776	Volume (pcph)	480

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

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Leisch Method for Weaving Analysis

Data Input

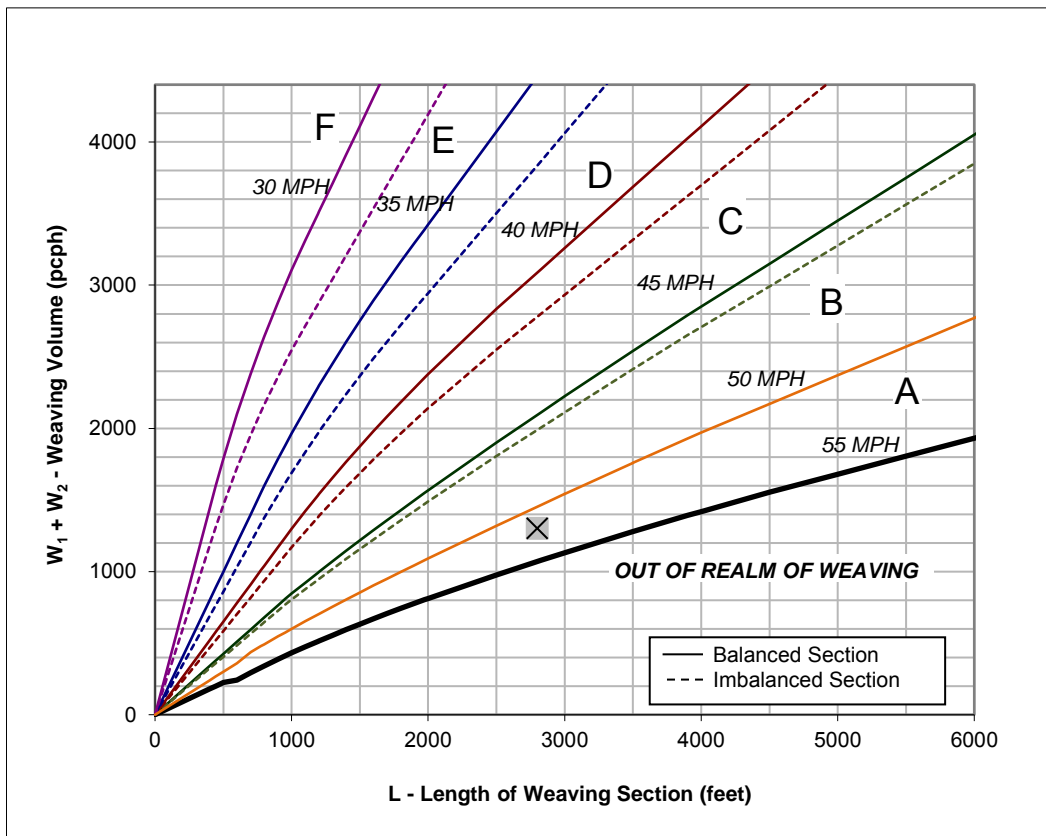
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,800

Project Information

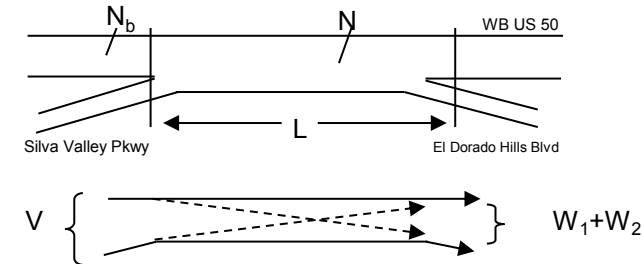
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	WB US 50
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,170	Volume (vph)*	783	Volume (vph)*	503
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,196	Volume (pcph)	791	Volume (pcph)	511

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
50 MPH and 55 MPH
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) 52.0
- Weaving Intensity Factor (k) 1.00
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,299
- Level of Service (LOS) C

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

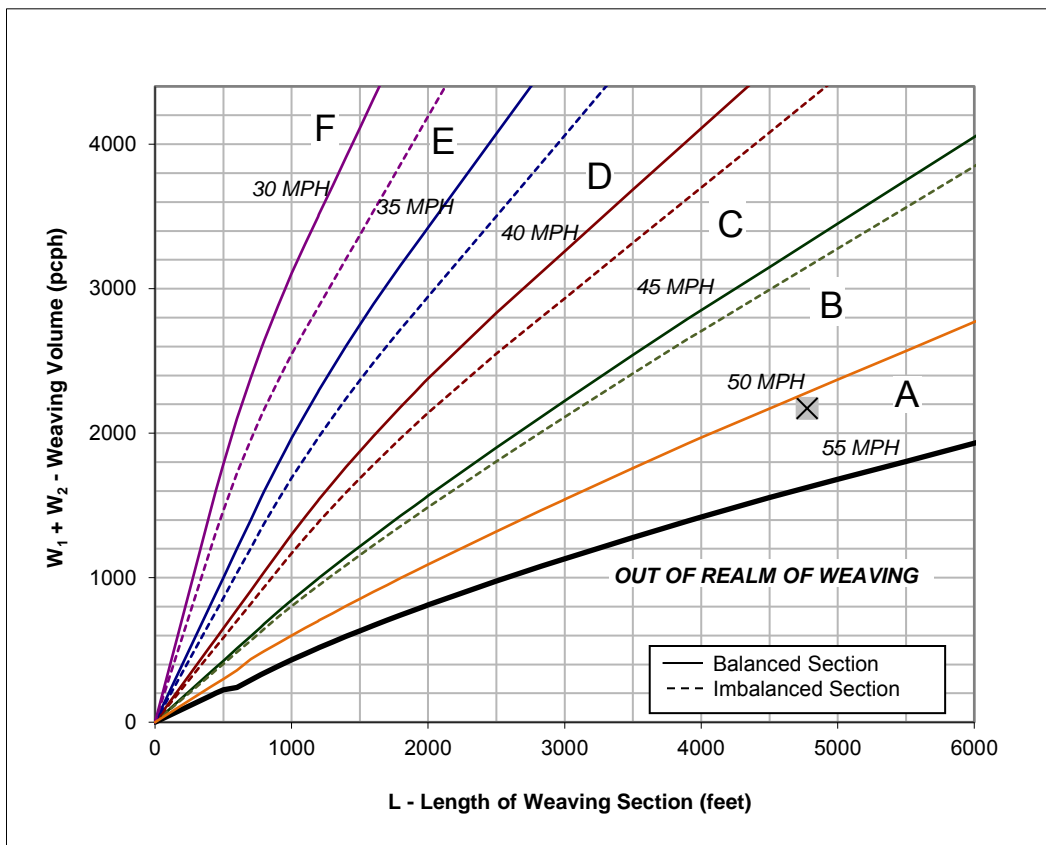
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	4,775

Project Information

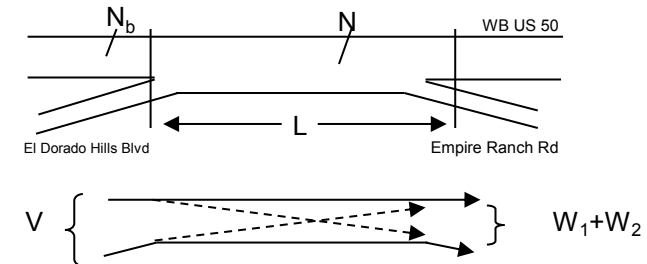
Project	Marble Valley EIR
Scenario	Cumulative Plus Project AM Peak Hour
Freeway	WB US 50
On-ramp	El Dorado Hills Blvd
Off-ramp	Empire Ranch Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	6,090	Volume (vph)*	903	Volume (vph)*	1,243
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	6,120	Volume (pcph)	912	Volume (pcph)	1,261

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
50 MPH and 55 MPH
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) 50.8
- Weaving Intensity Factor (k) 1.00
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ 1,530
- Level of Service (LOS) D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

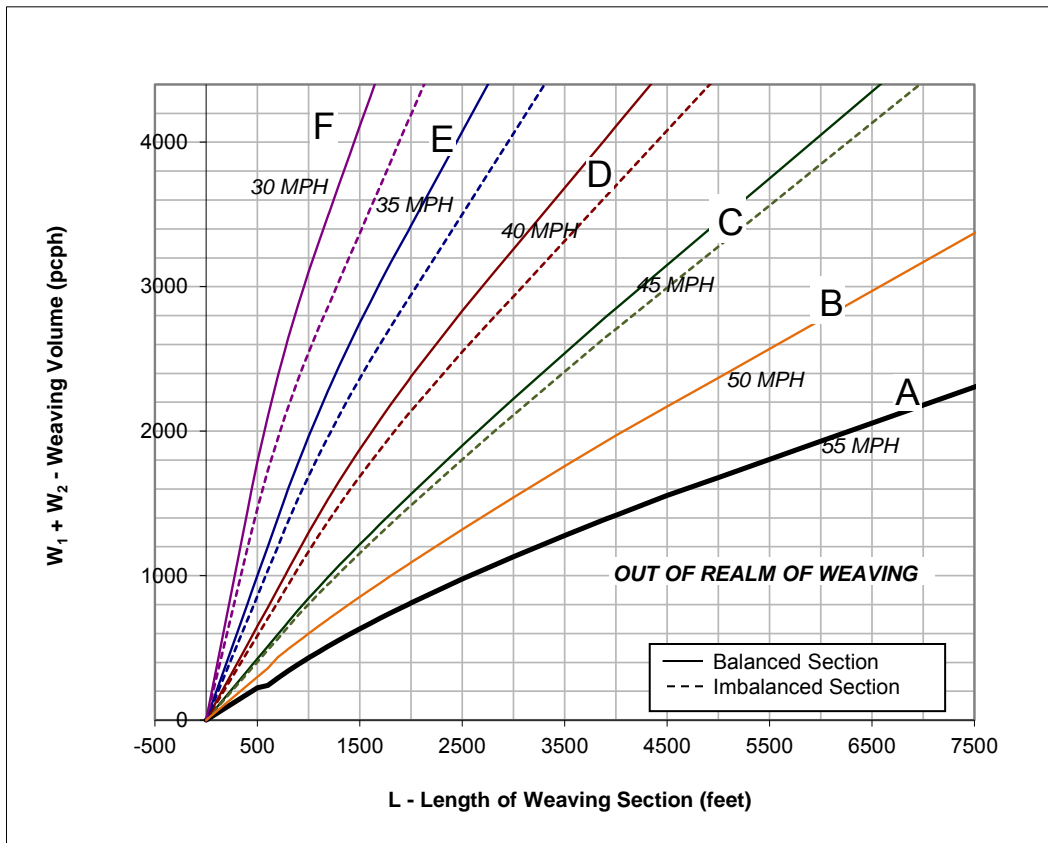
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	8,250

Project Information

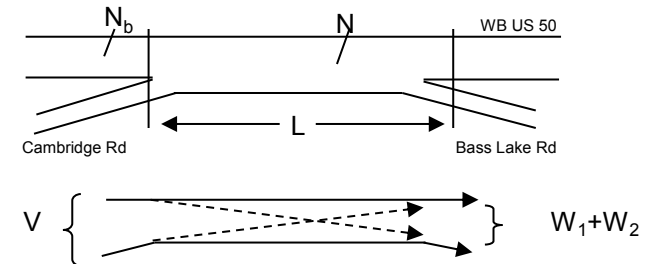
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	WB US 50
On-ramp	Cambridge Rd
Off-ramp	Bass Lake Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,300	Volume (vph)*	420	Volume (vph)*	380
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,322	Volume (pcph)	424	Volume (pcph)	384

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? N
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

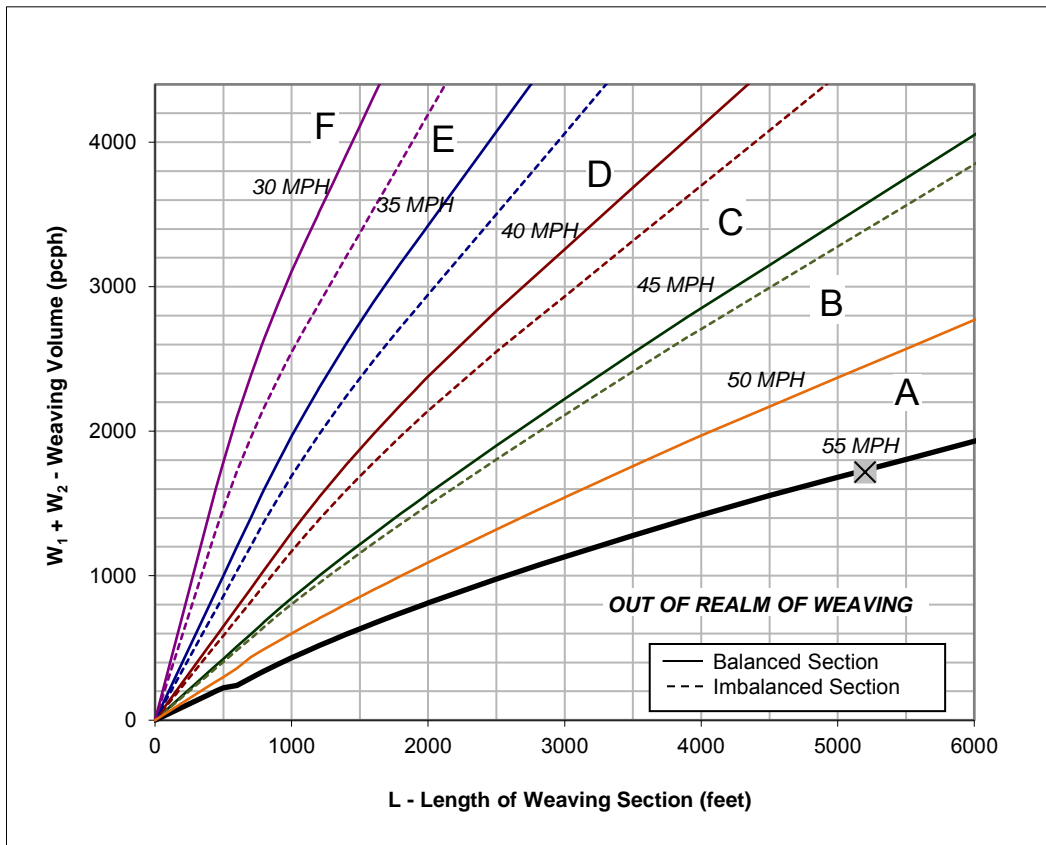
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	5,200

Project Information

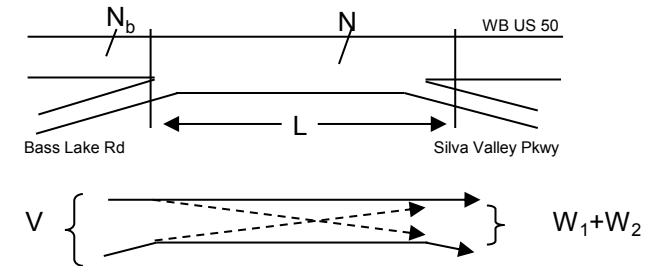
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	WB US 50
On-ramp	Bass Lake Rd
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,950	Volume (vph)*	749	Volume (vph)*	949
Truck Percentage	1%	Truck Percentage	3%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,975	Volume (pcph)	760	Volume (pcph)	958

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between? 55 MPH and -
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

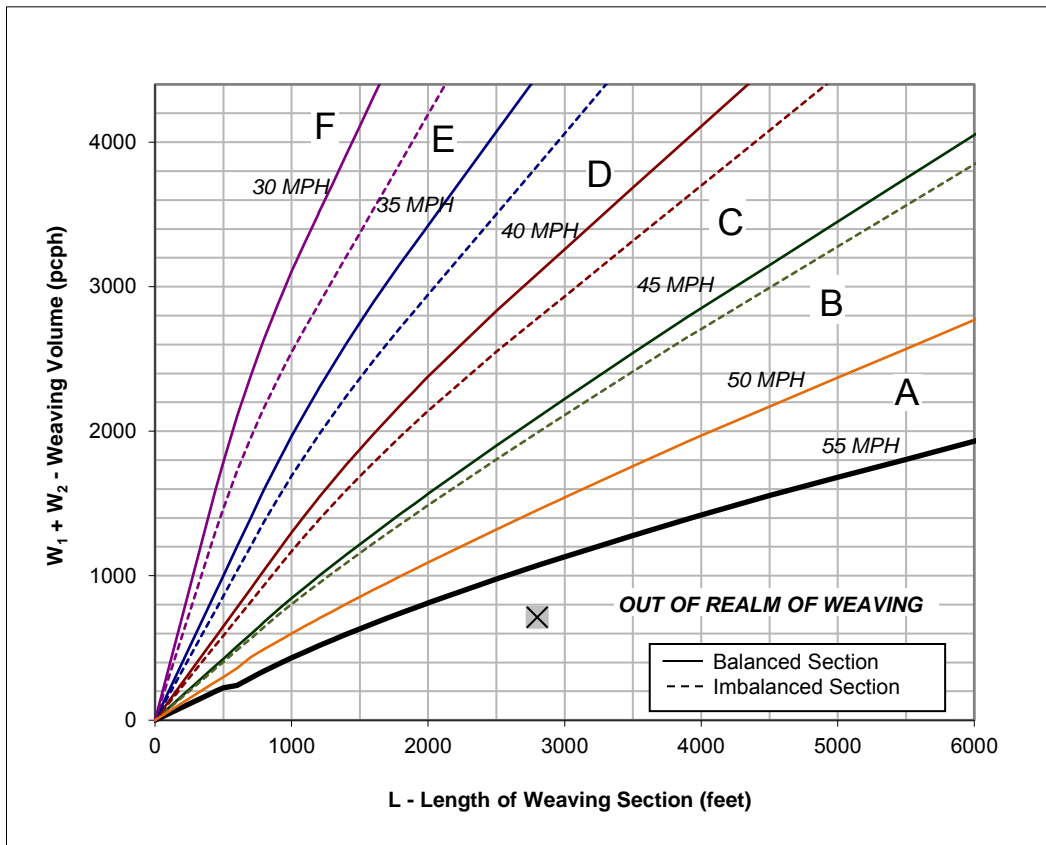
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	2,800

Project Information

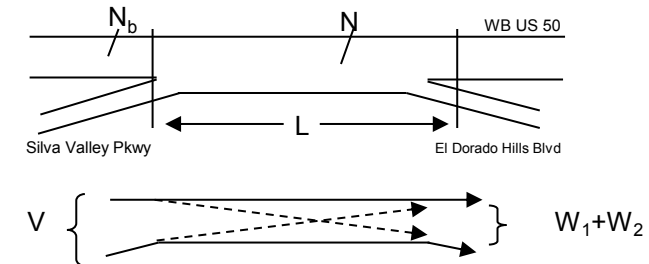
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	WB US 50
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,900	Volume (vph)*	199	Volume (vph)*	504
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	3%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,920	Volume (pcph)	201	Volume (pcph)	512

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
55 MPH and -
- If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

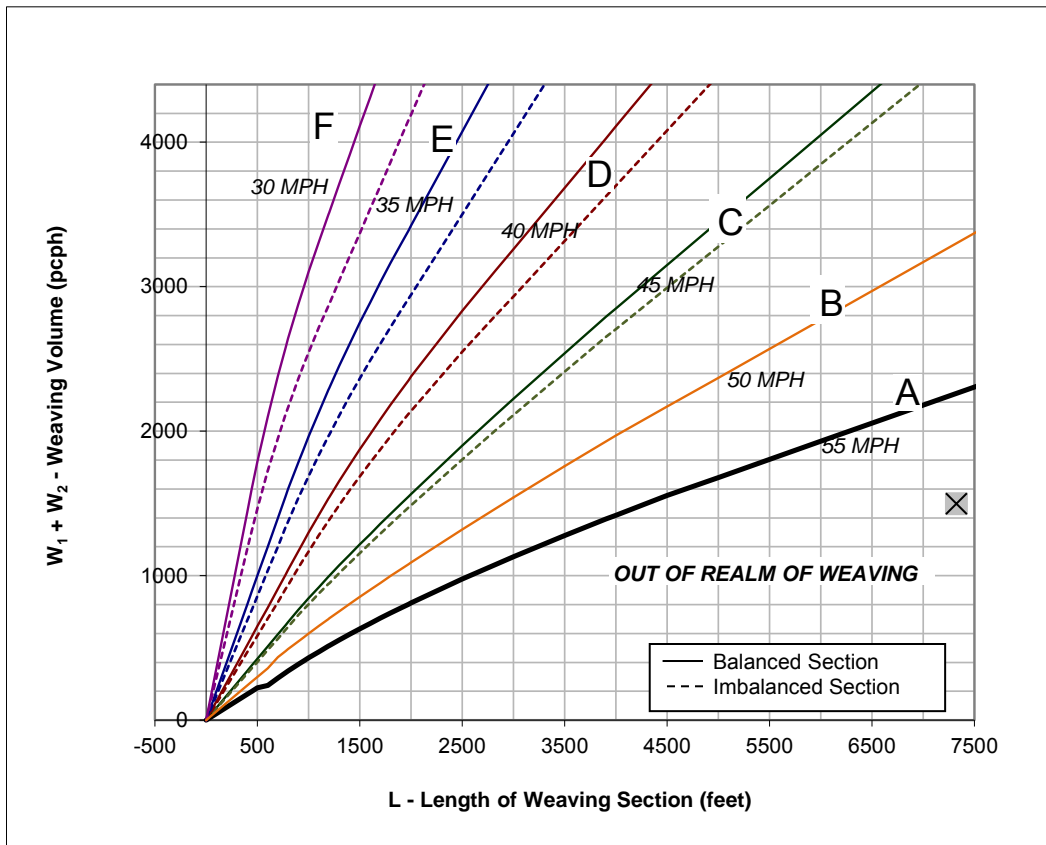
Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	7,325

Project Information

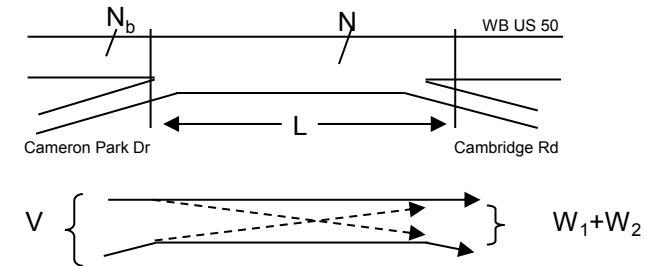
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	WB US 50
On-ramp	Cameron Park Dr
Off-ramp	Cambridge Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	5,080	Volume (vph)*	581	Volume (vph)*	901
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,105	Volume (pcph)	587	Volume (pcph)	910

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? N
 [If optional exit lane, then "Y". Otherwise "N".]

2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?

55 MPH and -

If below the 55 MPH curve, out of the realm of weaving.
 If left of the 30 MPH curve, LOS is F.

3. Interpolated Weaving Speed (S_w , mph) -

4. Weaving Intensity Factor (k) -

5. Service Volume (SV, pcph)

$$SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$$

6. Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

Leisch Method for Weaving Analysis

Data Input

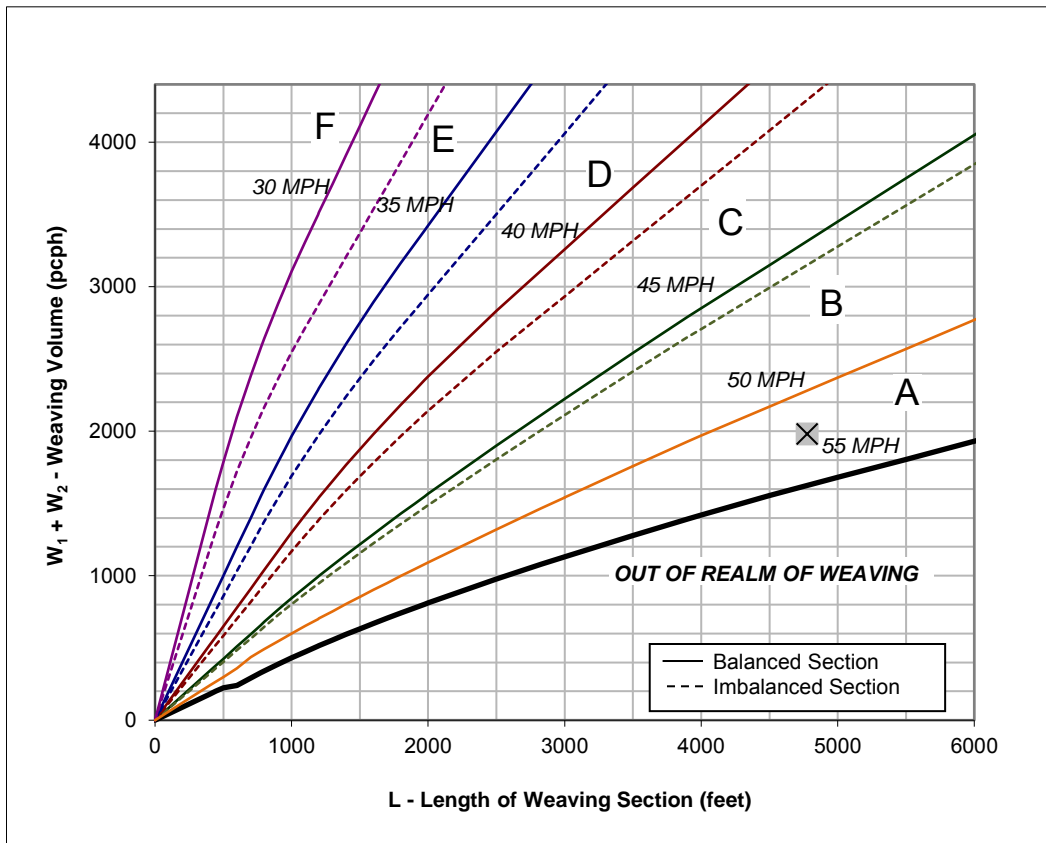
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	4
Length of Weaving Section (feet)	L	4,775

Project Information

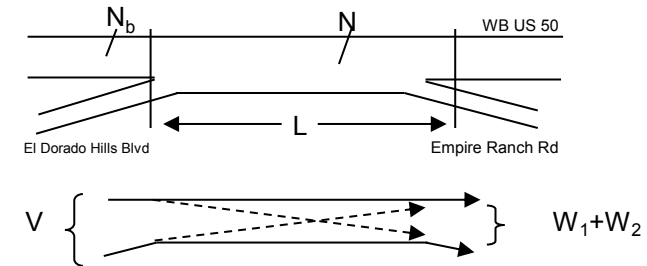
Project	Marble Valley EIR
Scenario	Cumulative Plus Project PM Peak Hour
Freeway	WB US 50
On-ramp	El Dorado Hills Blvd
Off-ramp	Empire Ranch Rd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,835	Volume (vph)*	811	Volume (vph)*	1,151
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,859	Volume (pcph)	819	Volume (pcph)	1,162

*Some vehicles were assumed to continue from the on-ramp to the off-ramp without weaving



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? **N**
[If optional exit lane, then "Y". Otherwise "N".]
- In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
50 MPH and **55 MPH**
If below the 55 MPH curve, out of the realm of weaving.
If left of the 30 MPH curve, LOS is F.
- Interpolated Weaving Speed (S_w , mph) **52.3**
- Weaving Intensity Factor (k) **1.00**
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ **1,215**
- Level of Service (LOS) **C**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.












Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

APPENDIX A:
Existing and Cumulative Mitigations

DRAFT

HCM Signalized Intersection Capacity Analysis
4: Bass Lake Road & Country Club Drive



















Existing Plus Project Mitigations
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	281	83	269	159	135	780
Future Volume (vph)	281	83	269	159	135	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1729		1827	1518	1770	1863
Flt Permitted	0.96		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1729		1827	1518	1770	1863
Peak-hour factor, PHF	0.79	0.79	0.72	0.72	0.83	0.83
Adj. Flow (vph)	356	105	374	221	163	940
RTOR Reduction (vph)	14	0	0	135	0	0
Lane Group Flow (vph)	447	0	374	86	163	940
Confl. Peds. (#/hr)	2	2		2	2	
Heavy Vehicles (%)	2%	2%	4%	4%	2%	2%
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	20.6		26.6	26.6	8.8	39.4
Effective Green, g (s)	20.6		26.6	26.6	8.8	39.4
Actuated g/C Ratio	0.30		0.39	0.39	0.13	0.58
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	523		714	593	229	1079
v/s Ratio Prot	c0.26		0.20		0.09	c0.50
v/s Ratio Perm				0.06		
v/c Ratio	0.85		0.52	0.15	0.71	0.87
Uniform Delay, d1	22.3		15.9	13.4	28.4	12.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	12.9		0.7	0.1	10.0	7.9
Delay (s)	35.2		16.5	13.5	38.4	20.0
Level of Service	D		B	B	D	C
Approach Delay (s)	35.2		15.4			22.7
Approach LOS	D		B			C
Intersection Summary						
HCM 2000 Control Delay			23.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.93			
Actuated Cycle Length (s)			68.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			68.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

5: Bass Lake Road & US 50 WB Ramps

Existing Plus Project Mitigations
AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	218	0	97	0	331	950	0	349	712	
Future Volume (vph)	0	0	0	218	0	97	0	331	950	0	349	712	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes					1.00	0.99		1.00	0.98		1.00	0.98	
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					0.95	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (prot)					1731	1532		1845	1534		1863	1546	
Flt Permitted					0.95	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)					1731	1532		1845	1534		1863	1546	
Peak-hour factor, PHF	0.92	0.92	0.92	0.61	0.61	0.61	0.82	0.82	0.82	0.89	0.89	0.89	
Adj. Flow (vph)	0	0	0	357	0	159	0	404	1159	0	392	800	
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	536	0	0	393	
Lane Group Flow (vph)	0	0	0	0	357	115	0	404	623	0	392	407	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%	
Turn Type				Perm	NA	Perm		NA	Perm		NA	Perm	
Protected Phases					8			2			6		
Permitted Phases				8		8			2			6	
Actuated Green, G (s)					19.7	19.7		28.7	28.7		28.7	28.7	
Effective Green, g (s)					19.7	19.7		28.7	28.7		28.7	28.7	
Actuated g/C Ratio					0.35	0.35		0.51	0.51		0.51	0.51	
Clearance Time (s)					4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)					3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)					604	535		938	780		948	786	
v/s Ratio Prot								0.22			0.21		
v/s Ratio Perm					0.21	0.08			c0.41			0.26	
v/c Ratio					0.59	0.22		0.43	0.80		0.41	0.52	
Uniform Delay, d1					15.0	12.9		8.7	11.5		8.6	9.2	
Progression Factor					1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					1.6	0.2		0.3	5.7		0.3	0.6	
Delay (s)					16.6	13.1		9.0	17.2		8.9	9.8	
Level of Service					B	B		A	B		A	A	
Approach Delay (s)		0.0			15.5			15.1			9.5		
Approach LOS		A			B			B			A		
Intersection Summary													
HCM 2000 Control Delay			13.1		HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio			0.71										
Actuated Cycle Length (s)			56.4		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			63.0%		ICU Level of Service					B			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps

Existing Plus Project Mitigations
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↖	↗↗					↖↖	↗	↘	↖		
Traffic Volume (vph)	186	1	419	0	0	0	0	1095	266	141	426	0	
Future Volume (vph)	186	1	419	0	0	0	0	1095	266	141	426	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0					4.0	4.0	4.0	4.0		
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	1.00		
Frbp, ped/bikes		1.00	0.97					1.00	0.98	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	1.00		
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1734	2663					3471	1519	1770	1863		
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (perm)		1734	2663					3471	1519	1770	1863		
Peak-hour factor, PHF	0.74	0.74	0.74	0.92	0.92	0.92	0.61	0.61	0.61	0.71	0.71	0.71	
Adj. Flow (vph)	251	1	566	0	0	0	0	1795	436	199	600	0	
RTOR Reduction (vph)	0	0	469	0	0	0	0	0	197	0	0	0	
Lane Group Flow (vph)	0	252	97	0	0	0	0	1795	239	199	600	0	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2	
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	2%	2%	2%	
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA		
Protected Phases		4						2		1	6		
Permitted Phases	4		4						2				
Actuated Green, G (s)		14.4	14.4					46.0	46.0	11.6	61.6		
Effective Green, g (s)		14.4	14.4					46.0	46.0	11.6	61.6		
Actuated g/C Ratio		0.17	0.17					0.55	0.55	0.14	0.73		
Clearance Time (s)		4.0	4.0					4.0	4.0	4.0	4.0		
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		297	456					1900	831	244	1366		
v/s Ratio Prot								c0.52		c0.11	0.32		
v/s Ratio Perm		0.15	0.04						0.16				
v/c Ratio		0.85	0.21					0.94	0.29	0.82	0.44		
Uniform Delay, d1		33.7	29.9					17.8	10.2	35.2	4.4		
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00		
Incremental Delay, d2		19.6	0.2					10.3	0.2	18.6	0.2		
Delay (s)		53.4	30.2					28.1	10.4	53.7	4.6		
Level of Service		D	C					C	B	D	A		
Approach Delay (s)		37.3			0.0			24.7			16.9		
Approach LOS		D			A			C			B		
Intersection Summary													
HCM 2000 Control Delay			25.7									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.90										
Actuated Cycle Length (s)			84.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			65.1%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
7: Marble Valley Road & Marble Mountain Road

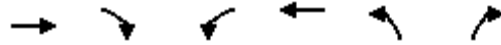
Existing Plus Project Mitigations
AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	21	0	1361	837	8
Future Volume (Veh/h)	0	21	0	1361	837	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.40	0.40	0.60	0.60
Hourly flow rate (vph)	0	28	0	3403	1395	13
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)				311		
pX, platoon unblocked						
vC, conflicting volume	3107	708	1410			
vC1, stage 1 conf vol	1404					
vC2, stage 2 conf vol	1704					
vCu, unblocked vol	3107	708	1410			
tC, single (s)	6.8	6.9	4.3			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.3			
p0 queue free %	100	93	100			
cM capacity (veh/h)	104	376	431			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	28	0	1702	1702	930	478
Volume Left	0	0	0	0	0	0
Volume Right	28	0	0	0	0	13
cSH	376	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.00	1.00	1.00	0.55	0.28
Queue Length 95th (ft)	6	0	0	0	0	0
Control Delay (s)	15.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	15.3	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			48.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
8: Marble Ridge Road & Marble Valley Road



















Existing Plus Project Mitigations
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (veh/h)	852	6	2	1353	0	20
Future Volume (Veh/h)	852	6	2	1353	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.42	0.92	0.92	0.40	0.40
Hourly flow rate (vph)	2029	14	2	1471	0	50
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage (veh)	2					
Upstream signal (ft)	830					
pX, platoon unblocked						
vC, conflicting volume			2045		2780	1026
vC1, stage 1 conf vol					2038	
vC2, stage 2 conf vol					742	
vCu, unblocked vol			2045		2780	1026
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	78
cM capacity (veh/h)			271		83	231
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1353	690	492	981	50	
Volume Left	0	0	2	0	0	
Volume Right	0	14	0	0	50	
cSH	1700	1700	271	1700	231	
Volume to Capacity	0.80	0.41	0.01	0.58	0.22	
Queue Length 95th (ft)	0	0	1	0	20	
Control Delay (s)	0.0	0.0	0.3	0.0	24.8	
Lane LOS	A			C		
Approach Delay (s)	0.0		0.1		24.8	
Approach LOS				C		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			49.4%	ICU Level of Service	A	
Analysis Period (min)	15					



















HCM Unsignalized Intersection Capacity Analysis
 9: Cambridge Road & Country Club Drive

Existing Plus Project Mitigations
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	73	67	29	91	72	13	12	161	43	15	393	139
Future Volume (vph)	73	67	29	91	72	13	12	161	43	15	393	139
Peak Hour Factor	0.56	0.56	0.56	0.58	0.58	0.58	0.78	0.78	0.78	0.83	0.83	0.83
Hourly flow rate (vph)	130	120	52	157	124	22	15	206	55	18	473	167
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	302	303	15	261	491	167						
Volume Left (vph)	130	157	15	0	18	0						
Volume Right (vph)	52	22	0	55	0	167						
Hadj (s)	0.02	0.09	0.53	-0.11	0.05	-0.67						
Departure Headway (s)	7.8	7.8	8.8	8.1	7.8	7.0						
Degree Utilization, x	0.65	0.66	0.04	0.59	1.06	0.33						
Capacity (veh/h)	443	436	387	415	454	503						
Control Delay (s)	24.0	24.6	10.9	21.0	85.8	12.2						
Approach Delay (s)	24.0	24.6	20.5		67.1							
Approach LOS	C	C	C		F							
Intersection Summary												
Delay			41.9									
Level of Service			E									
Intersection Capacity Utilization			52.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
10: Cambridge Road & Knollwood Drive

Existing Plus Project Mitigations
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	253	3	1	0	148	211	5	1	505	7
Future Volume (vph)	5	0	253	3	1	0	148	211	5	1	505	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.97			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.87			1.00		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1572			1795		1770	1855		1759	1858	
Flt Permitted		1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1572			1795		1770	1855		1759	1858	
Peak-hour factor, PHF	0.80	0.80	0.80	0.50	0.50	0.50	0.81	0.81	0.81	0.83	0.83	0.83
Adj. Flow (vph)	6	0	316	6	2	0	183	260	6	1	608	8
RTOR Reduction (vph)	0	290	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	32	0	0	8	0	183	265	0	1	616	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		9.0			2.4		18.3	81.8		0.8	64.3	
Effective Green, g (s)		9.0			2.4		18.3	81.8		0.8	64.3	
Actuated g/C Ratio		0.08			0.02		0.17	0.74		0.01	0.58	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		128			39		294	1379		12	1086	
v/s Ratio Prot		c0.02			c0.00		c0.10	0.14		0.00	c0.33	
v/s Ratio Perm												
v/c Ratio		0.25			0.21		0.62	0.19		0.08	0.57	
Uniform Delay, d1		47.3			52.9		42.6	4.2		54.2	14.2	
Progression Factor		1.00			1.00		0.94	0.77		1.00	1.00	
Incremental Delay, d2		1.0			2.6		3.3	0.3		3.0	2.1	
Delay (s)		48.4			55.5		43.3	3.5		57.2	16.3	
Level of Service		D			E		D	A		E	B	
Approach Delay (s)		48.4			55.5		19.7			16.4		
Approach LOS		D			E		B			B		
Intersection Summary												
HCM 2000 Control Delay			25.1				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			61.3%				ICU Level of Service			B		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 12: Cambridge Road & US 50 EB Ramps

Existing Plus Project Mitigations
 AM Peak Hour






















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	161	88	106	377	186	408
Future Volume (vph)	161	88	106	377	186	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.97	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.91	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1541	1770	1863	1663	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1541	1770	1863	1663	
Peak-hour factor, PHF	0.91	0.91	0.80	0.80	0.92	0.92
Adj. Flow (vph)	177	97	132	471	202	443
RTOR Reduction (vph)	0	83	0	0	126	0
Lane Group Flow (vph)	177	14	133	471	519	0
Confl. Peds. (#/hr)	2	2	2			2
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.8	7.8	5.6	39.2	29.6	
Effective Green, g (s)	7.8	7.8	5.6	39.2	29.6	
Actuated g/C Ratio	0.14	0.14	0.10	0.71	0.54	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	251	218	180	1327	894	
v/s Ratio Prot	c0.10		c0.08	0.25	c0.31	
v/s Ratio Perm		0.01				
v/c Ratio	0.71	0.06	0.74	0.35	0.58	
Uniform Delay, d1	22.5	20.4	24.0	3.0	8.5	
Progression Factor	1.00	1.00	0.99	0.87	0.69	
Incremental Delay, d2	8.7	0.1	10.8	0.5	1.9	
Delay (s)	31.2	20.6	34.5	3.2	7.9	
Level of Service	C	C	C	A	A	
Approach Delay (s)	27.4			10.1	7.9	
Approach LOS	C			B	A	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 13: Flying C Road & Crazy Horse Road & Cambridge Road

Existing Plus Project Mitigations
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	2	0	3	0	47	0	350	4	47	186	41
Future Volume (vph)	86	2	0	3	0	47	0	350	4	47	186	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	4.0
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	1.00
Frbp, ped/bikes		1.00			0.96			1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	1.00
Frt		1.00			0.87			1.00		1.00	1.00	0.85
Flt Protected		0.95			1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1776			1549			1859		1770	1863	1537
Flt Permitted		0.95			1.00			1.00		0.95	1.00	1.00
Satd. Flow (perm)		1776			1549			1859		1770	1863	1537
Peak-hour factor, PHF	0.67	0.67	0.67	0.71	0.71	0.71	0.39	0.39	0.39	0.69	0.69	0.69
Adj. Flow (vph)	128	3	0	4	0	66	0	897	10	68	270	59
RTOR Reduction (vph)	0	0	0	0	67	0	0	0	0	0	0	15
Lane Group Flow (vph)	0	131	0	0	3	0	0	907	0	68	270	44
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)		11.8			4.0			72.6		5.6	82.2	82.2
Effective Green, g (s)		11.8			4.0			72.6		5.6	82.2	82.2
Actuated g/C Ratio		0.11			0.04			0.66		0.05	0.75	0.75
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		190			56			1226		90	1392	1148
v/s Ratio Prot		c0.07			c0.00			c0.49		c0.04	0.14	
v/s Ratio Perm												0.03
v/c Ratio		0.69			0.05			0.74		0.76	0.19	0.04
Uniform Delay, d1		47.3			51.2			12.4		51.5	4.1	3.6
Progression Factor		1.00			1.00			1.00		1.06	0.90	1.04
Incremental Delay, d2		10.0			0.3			4.0		28.4	0.3	0.1
Delay (s)		57.3			51.5			16.4		82.9	4.0	3.8
Level of Service		E			D			B		F	A	A
Approach Delay (s)		57.3			51.5			16.4		17.5		
Approach LOS		E			D			B		B		
Intersection Summary												
HCM 2000 Control Delay			21.9									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0							16.0		
Intersection Capacity Utilization			43.5%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 21

Latrobe Rd/Town Center Blvd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	61	57	93.0%	38.6	4.2	D
	Through	809	799	98.7%	15.8	1.3	B
	Right Turn	58	55	94.7%	9.3	1.8	A
	Subtotal	928	910	98.1%	16.9	1.2	B
SB	Left Turn	475	465	97.9%	37.0	3.0	D
	Through	1,526	1,473	96.5%	13.0	1.0	B
	Right Turn	334	328	98.1%	5.8	0.5	A
	Subtotal	2,335	2,266	97.0%	16.9	0.9	B
EB	Left Turn	18	16	89.1%	33.9	7.0	C
	Through	5	4	82.6%	37.7	14.9	D
	Right Turn	8	8	104.4%	18.3	6.2	B
	Subtotal	31	29	92.0%	30.7	5.8	C
WB	Left Turn	62	65	104.1%	34.6	1.4	C
	Through	28	29	101.8%	32.3	5.7	C
	Right Turn	259	259	100.0%	14.3	1.6	B
	Subtotal	349	352	100.9%	19.5	1.8	B
Total		3,643	3,557	97.6%	17.3	0.8	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions
AM Peak Hour

Intersection 22

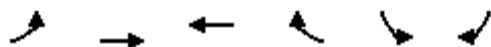
Latrobe Rd/White Rock Rd

Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	73	71	97.6%	61.0	3.7	E
	Through	535	535	100.0%	22.9	1.7	C
	Right Turn	162	155	95.6%	9.0	1.4	A
	Subtotal	770	761	98.9%	23.7	1.4	C
SB	Left Turn	118	112	94.9%	63.0	3.3	E
	Through	1,115	1,083	97.1%	22.5	1.7	C
	Right Turn	364	356	97.7%	13.2	1.0	B
	Subtotal	1,597	1,550	97.1%	23.3	1.3	C
EB	Left Turn	233	221	94.7%	52.7	1.5	D
	Through	104	102	98.1%	51.2	3.4	D
	Right Turn	42	41	98.7%	23.4	4.3	C
	Subtotal	379	364	96.1%	49.0	1.9	D
WB	Left Turn	373	366	98.2%	62.3	5.0	E
	Through	264	252	95.5%	63.3	4.6	E
	Right Turn	160	157	98.2%	7.6	1.3	A
	Subtotal	797	775	97.3%	51.5	3.7	D
Total		3,543	3,451	97.4%	32.4	1.1	C

HCM Unsignalized Intersection Capacity Analysis
30: Marble Valley Road












Existing Plus Project Mitigations
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	845	1328	0	0	0
Future Volume (Veh/h)	27	845	1328	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	918	1443	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1216				
pX, platoon unblocked						
vC, conflicting volume	1443				1960	722
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1443				1960	722
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	100
cM capacity (veh/h)	466				52	369
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	29	459	459	722	722	
Volume Left	29	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	466	1700	1700	1700	1700	
Volume to Capacity	0.06	0.27	0.27	0.42	0.42	
Queue Length 95th (ft)	5	0	0	0	0	
Control Delay (s)	13.2	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	0.4			0.0		
Approach LOS						
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			40.0%		ICU Level of Service	A
Analysis Period (min)			15			



















HCM Signalized Intersection Capacity Analysis
4: Bass Lake Road & Country Club Drive

Existing Plus Project Mitigations
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	52	674	269	56	383
Future Volume (vph)	145	52	674	269	56	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1721		1863	1549	1770	1863
Flt Permitted	0.96		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1721		1863	1549	1770	1863
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.96	0.96
Adj. Flow (vph)	169	60	702	280	58	399
RTOR Reduction (vph)	20	0	0	109	0	0
Lane Group Flow (vph)	209	0	702	171	58	399
Confl. Peds. (#/hr)	2	2		2	2	
Turn Type	Prot		NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases				2		
Actuated Green, G (s)	11.0		39.6	39.6	2.4	46.0
Effective Green, g (s)	11.0		39.6	39.6	2.4	46.0
Actuated g/C Ratio	0.17		0.61	0.61	0.04	0.71
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	291		1134	943	65	1318
v/s Ratio Prot	c0.12		c0.38		c0.03	0.21
v/s Ratio Perm				0.11		
v/c Ratio	0.72		0.62	0.18	0.89	0.30
Uniform Delay, d1	25.5		8.0	5.6	31.2	3.5
Progression Factor	1.00		0.27	0.06	1.00	1.00
Incremental Delay, d2	8.2		1.8	0.3	74.5	0.6
Delay (s)	33.7		3.9	0.6	105.7	4.1
Level of Service	C		A	A	F	A
Approach Delay (s)	33.7		3.0			17.0
Approach LOS	C		A			B
Intersection Summary						
HCM 2000 Control Delay			11.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			65.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			60.1%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						





















HCM Signalized Intersection Capacity Analysis
5: Bass Lake Road & US 50 WB Ramps

Existing Plus Project Mitigations
PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	336	1	124	0	819	708	0	283	245	
Future Volume (vph)	0	0	0	336	1	124	0	819	708	0	283	245	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes					1.00	0.99		1.00	0.98		1.00	0.98	
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					0.95	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (prot)					1767	1561		1863	1545		1863	1545	
Flt Permitted					0.95	1.00		1.00	1.00		1.00	1.00	
Satd. Flow (perm)					1767	1561		1863	1545		1863	1545	
Peak-hour factor, PHF	0.92	0.92	0.92	0.77	0.77	0.77	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	0	0	436	1	161	0	853	738	0	295	255	
RTOR Reduction (vph)	0	0	0	0	0	63	0	0	303	0	0	105	
Lane Group Flow (vph)	0	0	0	0	437	98	0	853	435	0	295	150	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2	
Turn Type				Perm	NA	Perm		NA	Perm		NA	Perm	
Protected Phases					8			2			6		
Permitted Phases				8		8			2			6	
Actuated Green, G (s)					18.7	18.7		38.3	38.3		38.3	38.3	
Effective Green, g (s)					18.7	18.7		38.3	38.3		38.3	38.3	
Actuated g/C Ratio					0.29	0.29		0.59	0.59		0.59	0.59	
Clearance Time (s)					4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)					3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)					508	449		1097	910		1097	910	
v/s Ratio Prot								c0.46			0.16		
v/s Ratio Perm					0.25	0.06			0.28			0.10	
v/c Ratio					0.86	0.22		0.78	0.48		0.27	0.17	
Uniform Delay, d1					21.9	17.6		10.1	7.6		6.5	6.1	
Progression Factor					1.00	1.00		1.00	1.00		0.74	0.31	
Incremental Delay, d2					13.9	0.2		5.4	1.8		0.6	0.4	
Delay (s)					35.8	17.8		15.6	9.4		5.4	2.2	
Level of Service					D	B		B	A		A	A	
Approach Delay (s)		0.0			31.0			12.7			3.9		
Approach LOS		A			C			B			A		
Intersection Summary													
HCM 2000 Control Delay			14.9		HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio			0.80										
Actuated Cycle Length (s)			65.0		Sum of lost time (s)					8.0			
Intersection Capacity Utilization			75.1%		ICU Level of Service					D			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps

Existing Plus Project Mitigations
PM Peak Hour

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations			 					 						
Traffic Volume (vph)	598	2	1043	0	0	0	0	929	307	99	520	0		
Future Volume (vph)	598	2	1043	0	0	0	0	929	307	99	520	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		4.0	4.0					4.0	4.0	4.0	4.0			
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	1.00			
Frbp, ped/bikes		1.00	0.98					1.00	0.98	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	1.00			
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00			
Satd. Flow (prot)		1771	2723					3539	1549	1770	1863			
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00			
Satd. Flow (perm)		1771	2723					3539	1549	1770	1863			
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.63	0.63	0.63	0.83	0.83	0.83		
Adj. Flow (vph)	616	2	1075	0	0	0	0	1475	487	119	627	0		
RTOR Reduction (vph)	0	0	336	0	0	0	0	0	199	0	0	0		
Lane Group Flow (vph)	0	618	739	0	0	0	0	1475	288	119	627	0		
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2		
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA			
Protected Phases		4						2		1	6			
Permitted Phases	4		4						2					
Actuated Green, G (s)		42.1	42.1					61.9	61.9	9.0	74.9			
Effective Green, g (s)		42.1	42.1					61.9	61.9	9.0	74.9			
Actuated g/C Ratio		0.34	0.34					0.50	0.50	0.07	0.60			
Clearance Time (s)		4.0	4.0					4.0	4.0	4.0	4.0			
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		596	917					1752	767	127	1116			
v/s Ratio Prot								c0.42		c0.07	0.34			
v/s Ratio Perm		0.35	0.27						0.19					
v/c Ratio		1.04	0.81					0.84	0.38	0.94	0.56			
Uniform Delay, d1		41.5	37.7					27.3	19.6	57.7	15.1			
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00			
Incremental Delay, d2		46.8	5.2					3.9	0.3	60.0	0.7			
Delay (s)		88.2	42.9					31.2	19.9	117.8	15.8			
Level of Service		F	D					C	B	F	B			
Approach Delay (s)		59.5			0.0			28.4			32.1			
Approach LOS		E			A			C			C			
Intersection Summary														
HCM 2000 Control Delay			41.0									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.92											
Actuated Cycle Length (s)			125.0								12.0			
Intersection Capacity Utilization			81.1%										ICU Level of Service	D
Analysis Period (min)			15											
c	Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
7: Marble Valley Road & Marble Mountain Road

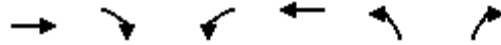
Existing Plus Project Mitigations
PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	8	0	1236	1544	19
Future Volume (Veh/h)	0	8	0	1236	1544	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.40	0.40	0.58	0.58	0.72	0.72
Hourly flow rate (vph)	0	20	0	2131	2144	26
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)				311		
pX, platoon unblocked						
vC, conflicting volume	3226	1089	2172			
vC1, stage 1 conf vol	2159					
vC2, stage 2 conf vol	1068					
vCu, unblocked vol	3226	1089	2172			
tC, single (s)	7.0	7.1	4.1			
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.4	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	61	194	242			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	20	0	1066	1066	1429	741
Volume Left	0	0	0	0	0	0
Volume Right	20	0	0	0	0	26
cSH	194	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.00	0.63	0.63	0.84	0.44
Queue Length 95th (ft)	8	0	0	0	0	0
Control Delay (s)	25.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	D					
Approach Delay (s)	25.7	0.0	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	53.9%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
8: Marble Ridge Road & Marble Valley Road



















Existing Plus Project Mitigations
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	1545	7	3	1236	0	9
Future Volume (Veh/h)	1545	7	3	1236	0	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.92	0.92	0.58	0.58
Hourly flow rate (vph)	2664	12	3	1343	0	16
Pedestrians	2			2	2	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage (veh)	2					
Upstream signal (ft)	830					
pX, platoon unblocked						
vC, conflicting volume			2678		3352	1342
vC1, stage 1 conf vol					2672	
vC2, stage 2 conf vol					680	
vCu, unblocked vol			2678		3352	1342
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	89
cM capacity (veh/h)			152		37	142
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	1776	900	451	895	16	
Volume Left	0	0	3	0	0	
Volume Right	0	12	0	0	16	
cSH	1700	1700	152	1700	142	
Volume to Capacity	1.04	0.53	0.02	0.53	0.11	
Queue Length 95th (ft)	0	0	2	0	9	
Control Delay (s)	0.0	0.0	1.0	0.0	33.6	
Lane LOS	A			D		
Approach Delay (s)	0.0		0.3		33.6	
Approach LOS						D
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			53.6%	ICU Level of Service	A	
Analysis Period (min)	15					



















HCM Unsignalized Intersection Capacity Analysis
 9: Cambridge Road & Country Club Drive

Existing Plus Project Mitigations
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	114	48	19	41	76	33	17	400	102	24	244	119
Future Volume (vph)	114	48	19	41	76	33	17	400	102	24	244	119
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.95	0.95	0.95	0.88	0.88	0.88
Hourly flow rate (vph)	133	56	22	51	94	41	18	421	107	27	277	135
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	211	186	18	528	304	135						
Volume Left (vph)	133	51	18	0	27	0						
Volume Right (vph)	22	41	0	107	0	135						
Hadj (s)	0.10	-0.04	0.53	-0.11	0.08	-0.67						
Departure Headway (s)	7.5	7.5	7.4	6.8	7.2	6.5						
Degree Utilization, x	0.44	0.39	0.04	0.99	0.61	0.24						
Capacity (veh/h)	458	455	471	528	491	544						
Control Delay (s)	16.3	15.2	9.5	62.1	19.8	10.3						
Approach Delay (s)	16.3	15.2	60.4		16.9							
Approach LOS	C	C	F		C							
Intersection Summary												
Delay			33.8									
Level of Service			D									
Intersection Capacity Utilization			56.1%	ICU Level of Service	B							
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
10: Cambridge Road & Knollwood Drive

Existing Plus Project Mitigations
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	147	6	6	2	217	510	2	2	294	9
Future Volume (vph)	7	1	147	6	6	2	217	510	2	2	294	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.87			0.98		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583			1778		1770	1862		1765	1853	
Flt Permitted		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1583			1778		1770	1862		1765	1853	
Peak-hour factor, PHF	0.92	0.92	0.92	0.75	0.75	0.75	0.90	0.90	0.90	0.91	0.91	0.91
Adj. Flow (vph)	8	1	160	8	8	3	241	567	2	2	323	10
RTOR Reduction (vph)	0	143	0	0	3	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	26	0	0	16	0	241	569	0	2	332	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		8.2			3.7		15.7	46.3		0.8	31.4	
Effective Green, g (s)		8.2			3.7		15.7	46.3		0.8	31.4	
Actuated g/C Ratio		0.11			0.05		0.21	0.62		0.01	0.42	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173			87		370	1149		18	775	
v/s Ratio Prot		c0.02			c0.01		c0.14	c0.31		0.00	c0.18	
v/s Ratio Perm												
v/c Ratio		0.15			0.19		0.65	0.50		0.11	0.43	
Uniform Delay, d1		30.3			34.2		27.1	7.9		36.7	15.4	
Progression Factor		1.00			1.00		0.71	0.57		1.00	1.00	
Incremental Delay, d2		0.4			1.0		3.3	1.2		2.7	1.7	
Delay (s)		30.7			35.2		22.5	5.7		39.5	17.2	
Level of Service		C			D		C	A		D	B	
Approach Delay (s)		30.7			35.2		10.7			17.3		
Approach LOS		C			D		B			B		
Intersection Summary												
HCM 2000 Control Delay			15.3				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			75.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			50.3%				ICU Level of Service			A		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
12: Cambridge Road & US 50 EB Ramps

Existing Plus Project Mitigations
PM Peak Hour






















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	256	108	273	280	283
Future Volume (vph)	448	256	108	273	280	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.93	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1547	1770	1863	1715	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1547	1770	1863	1715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	487	278	117	297	304	308
RTOR Reduction (vph)	0	142	0	0	45	0
Lane Group Flow (vph)	487	136	117	297	567	0
Confl. Peds. (#/hr)	2	2	2			2
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.3	23.3	5.6	43.7	34.1	
Effective Green, g (s)	23.3	23.3	5.6	43.7	34.1	
Actuated g/C Ratio	0.31	0.31	0.07	0.58	0.45	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	549	480	132	1085	779	
v/s Ratio Prot	c0.28		c0.07	0.16	c0.33	
v/s Ratio Perm		0.09				
v/c Ratio	0.89	0.28	0.89	0.27	0.73	
Uniform Delay, d1	24.6	19.5	34.4	7.8	16.7	
Progression Factor	1.00	1.00	0.93	0.63	0.51	
Incremental Delay, d2	15.9	0.3	44.7	0.6	4.5	
Delay (s)	40.5	19.9	76.7	5.5	12.9	
Level of Service	D	B	E	A	B	
Approach Delay (s)	33.0			25.6	12.9	
Approach LOS	C			C	B	

Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 13: Flying C Road & Crazy Horse Road & Cambridge Road

Existing Plus Project Mitigations
 PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	60	0	0	4	1	61	0	260	4	61	374	101	
Future Volume (vph)	60	0	0	4	1	61	0	260	4	61	374	101	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	1.00	
Frbp, ped/bikes		1.00			0.97			1.00		1.00	1.00	0.97	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	1.00	
Frt		1.00			0.88			1.00		1.00	1.00	0.85	
Flt Protected		0.95			1.00			1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1770			1575			1858		1770	1863	1542	
Flt Permitted		0.95			1.00			1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1770			1575			1858		1770	1863	1542	
Peak-hour factor, PHF	0.79	0.79	0.79	0.71	0.71	0.71	0.93	0.93	0.93	0.96	0.96	0.96	
Adj. Flow (vph)	76	0	0	6	1	86	0	280	4	64	390	105	
RTOR Reduction (vph)	0	0	0	0	80	0	0	0	0	0	0	35	
Lane Group Flow (vph)	0	76	0	0	13	0	0	284	0	64	390	70	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm	
Protected Phases	4	4		8	8		5	2		1	6		
Permitted Phases												6	
Actuated Green, G (s)		7.1			5.6			41.1		5.2	50.3	50.3	
Effective Green, g (s)		7.1			5.6			41.1		5.2	50.3	50.3	
Actuated g/C Ratio		0.09			0.07			0.55		0.07	0.67	0.67	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		167			117			1018		122	1249	1034	
v/s Ratio Prot		c0.04			c0.01			0.15		c0.04	c0.21		
v/s Ratio Perm												0.05	
v/c Ratio		0.46			0.11			0.28		0.52	0.31	0.07	
Uniform Delay, d1		32.1			32.4			9.0		33.7	5.1	4.3	
Progression Factor		1.00			1.00			1.00		0.92	0.78	1.53	
Incremental Delay, d2		2.0			0.4			0.7		3.3	0.5	0.1	
Delay (s)		34.1			32.8			9.7		34.4	4.5	6.6	
Level of Service		C			C			A		C	A	A	
Approach Delay (s)		34.1			32.8			9.7			8.3		
Approach LOS		C			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			12.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.34										
Actuated Cycle Length (s)			75.0									Sum of lost time (s)	16.0
Intersection Capacity Utilization			43.0%									ICU Level of Service	A
Analysis Period (min)			15										
c	Critical Lane Group												

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Marble Valley EIR
Existing Plus Project Conditions (Mitigated)
PM Peak Hour

Intersection 21 Latrobe Rd/Town Center Blvd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	4	3	69.6%	65.3	20.1	E
	Through	1,436	1,390	96.8%	45.0	2.5	D
	Right Turn	79	82	104.3%	44.8	9.2	D
	Subtotal	1,519	1,475	97.1%	45.0	2.9	D
SB	Left Turn	516	477	92.4%	68.8	12.5	E
	Through	966	952	98.5%	17.3	2.2	B
	Right Turn	27	28	103.5%	2.4	0.4	A
	Subtotal	1,509	1,456	96.5%	33.9	5.1	C
EB	Left Turn	336	325	96.6%	77.1	19.0	E
	Through	24	27	112.4%	43.2	7.1	D
	Right Turn	89	87	97.4%	13.9	1.9	B
	Subtotal	449	438	97.6%	62.7	14.9	E
WB	Left Turn	63	65	102.7%	103.2	33.5	F
	Through	3	3	102.4%	95.8	53.1	F
	Right Turn	639	620	97.0%	50.2	18.5	D
	Subtotal	705	687	97.5%	55.5	20.1	E
Total		4,182	4,057	97.0%	44.8	3.6	D

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

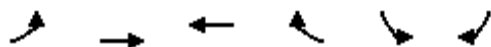
Marble Valley EIR
Existing Plus Project Conditions (Mitigated)
PM Peak Hour

Intersection 22 Latrobe Rd/White Rock Rd Signal

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		LOS
			Average	Percent	Average	Std. Dev.	
NB	Left Turn	63	60	95.4%	46.8	4.0	D
	Through	932	902	96.8%	34.7	2.2	C
	Right Turn	368	361	98.0%	30.5	4.2	C
	Subtotal	1,363	1,323	97.0%	34.1	2.7	C
SB	Left Turn	234	230	98.1%	43.3	2.3	D
	Through	648	642	99.1%	22.3	1.6	C
	Right Turn	235	232	98.9%	9.0	0.7	A
	Subtotal	1,117	1,104	98.9%	23.9	1.3	C
EB	Left Turn	374	365	97.6%	41.5	3.6	D
	Through	313	303	97.0%	32.7	1.6	C
	Right Turn	106	108	101.7%	20.8	1.8	C
	Subtotal	793	776	97.9%	35.2	2.0	D
WB	Left Turn	203	193	95.2%	37.6	1.9	D
	Through	146	141	96.8%	37.8	2.8	D
	Right Turn	210	203	96.5%	8.1	0.7	A
	Subtotal	559	537	96.1%	26.5	1.5	C
Total		3,832	3,740	97.6%	30.3	1.2	C

HCM Unsignalized Intersection Capacity Analysis
30: Marble Valley Road

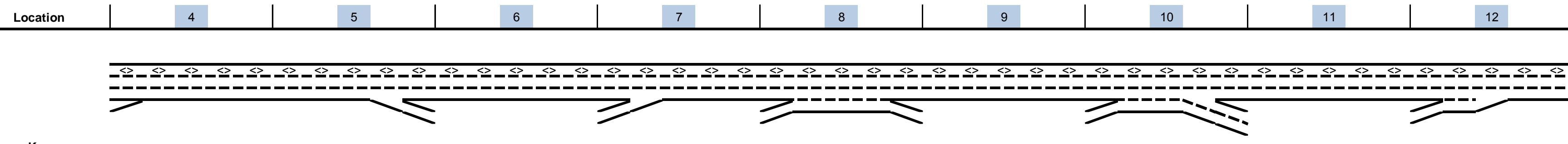
Existing Plus Project Mitigations
PM Peak Hour



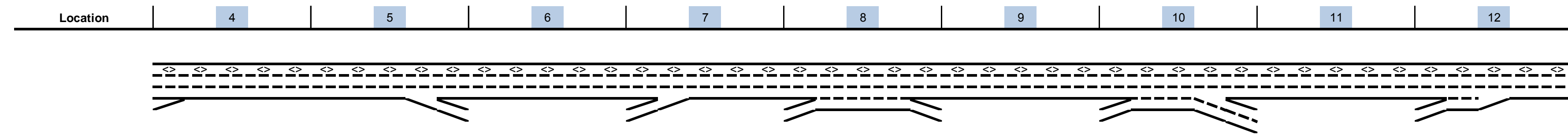
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	1539	1224	0	0	0
Future Volume (Veh/h)	15	1539	1224	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1673	1330	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1194				
pX, platoon unblocked						
vC, conflicting volume	1330				2198	665
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1330				2198	665
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	100
cM capacity (veh/h)	515				37	403
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	
Volume Total	16	836	836	665	665	
Volume Left	16	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	515	1700	1700	1700	1700	
Volume to Capacity	0.03	0.49	0.49	0.39	0.39	
Queue Length 95th (ft)	2	0	0	0	0	
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	0.1			0.0		
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			45.9%		ICU Level of Service	A
Analysis Period (min)			15			

Alternative: Existing Plus Project Conditions (MITIGATED)
Time Period: AM Peak Hour

Data Entry Value
Calculated Value

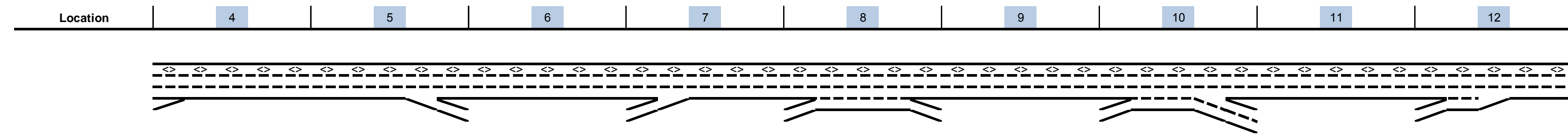


Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silver Valley Pkwy	Silver Valley Pkwy off to on-ramp	Silver Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on-ramp	El Dorado Hills Blvd on-ramp
Define Freeway Segment									
Type	Basic	Diverge	Basic	Merge	Weave	Basic	Weave	Basic	Merge
Length (ft)	4,900	1,500	2,350	1,500	6,500	2,550	2,800	2,300	1,500
Accel Length				375					980
Decel Length		150							
Mainline Volume	3,576	3,576	3,261	3,261	4,216	4,137	4,137	3,670	3,670
On Ramp Volume				955	759		121		922
Off Ramp Volume		315			838		588		
Express Lane Volume	393	393	359	359	464	455	455	404	404
EL On Ramp Volume									
EL Off Ramp Volume									
Calculate Flow Rate in General Purpose Lanes (GP)									
GP Volume (vph)	3,183	3,183	2,902	3,857	4,511	3,682	3,803	3,266	4,188
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
GP Lanes	2	2	2	2	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995	0.995
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	3,403	3,403	3,103	4,124	4,823	3,937	4,066	3,492	4,478
GP Flow (pcphpl)	1,701	1,701	1,551	2,062	1,608	1,968	1,355	1,746	2,239
Calculate Speed in General Purpose Lanes									
Lane Width (ft)	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
f _{LW}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{LC}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcd FFS	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes									
v/c ratio	0.72	0.72	0.66	0.88	0.88	0.84	0.58	0.74	0.95
Speed (mph)	63.7	63.7	64.7	58.8	64.4	60.4	65.0	63.3	55.0
Density (pcphpl)	26.7	26.7	24.0	35.1	25.0	32.6	20.9	27.6	40.7
LOS	D	D	C	E	C	D	C	D	E
Calculate Operations for Entering GP Lanes									
GP _{IN} Vol (pcph)				2,942	3,962		3,936		3,466
GP _{IN} Cap (pcph)				4,700	4,700		4,700		4,700
GP _{IN} v/c ratio				0.63	0.84		0.84		0.74
Calculate Operations for Exiting GP Lanes									
GP _{OUT} Vol (pcph)		2,881			3,850		3,420		
GP _{OUT} Cap (pcph)		4,700			4,700		4,700		
GP _{OUT} v/c ratio		0.61			0.82		0.73		



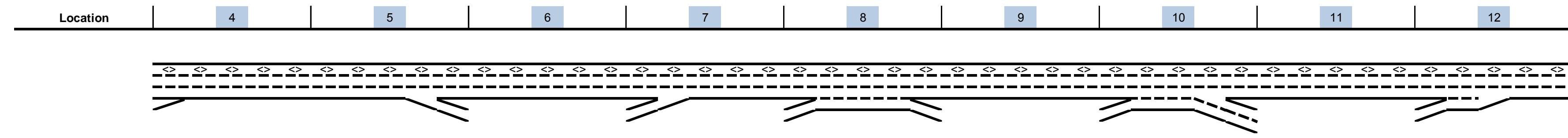
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Flow Rate in Express Lanes (EL)									
EL Volume (vph)	393	393	359	359	464	455	455	404	404
PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Express Lanes	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{RV}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	446	446	407	407	526	516	516	458	458
EL Flow (pcphpl)	446	446	407	407	526	516	516	458	458
Calculate Speed in Express Lanes									
Lane Width (ft)									
Shoulder Width									
TRD									
f _{LW}									
f _{LC}									
Calcd FFS									
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes									
EL _N v/c ratio	0.26	0.26	0.23	0.23	0.30	0.30	0.30	0.26	0.26
Calculate On Ramp Flow Rate									
On Volume (vph)				955	759		121		922
PHF				0.82	0.89		0.93		0.92
Total Lanes				1	1		1		1
Terrain				Level	Level		Level		Level
Grade %				0.0%	0.0%		0.0%		0.0%
Grade Length (mi)				0.00	0.00		0.00		0.00
Truck & Bus %				3.0%	2.0%		0.0%		2.0%
RV %				0.0%	0.0%		0.0%		0.0%
E _T				1.5	1.5		1.5		1.5
E _R				1.2	1.2		1.2		1.2
f _{RV}				0.985	0.990		1.000		0.990
f _p				1.00	1.00		1.00		1.00
On Flow (pcph)				1,182	861		130		1,012
On Flow (pcphpl)				1,182	861		130		1,012
Calculate On Ramp Roadway Operations									
On Ramp Type				Right	Right		Right		Right
On Ramp Speed (mph)				25	45		45		45
On Ramp Cap (pcph)				1,900	2,100		2,100		2,100
On Ramp v/c ratio				0.62	0.41		0.06		0.48



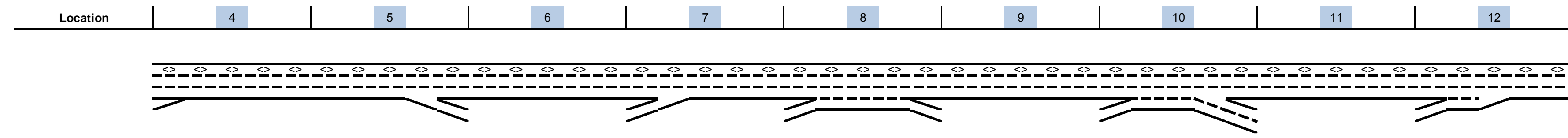
Key
 <-> Express Lane (HOV)
 - - - - - No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hill Blvd on-ramp
Calculate Off Ramp Flow Rate									
Off Volume (vph)		315			838		588		
PHF		0.61			0.87		0.92		
Total Lanes		1			1		2		
Terrain		Level			Level		Level		
Grade %		0.0%			0.0%		0.0%		
Grade Length (mi)		0.00			0.00		0.00		
Truck & Bus %		2.0%			2.0%		2.0%		
RV %		0.0%			0.0%		0.0%		
E _T		1.5			1.5		1.5		
E _R		1.2			1.2		1.2		
f _{RV}		0.990			0.990		0.990		
f _p		1.00			1.00		1.00		
Off Flow (pcph)		522			973		646		
Off Flow (pcphpl)		522			973		323		
Calculate Off Ramp Roadway Operations									
Off Ramp Type		Right			Right		Right		
Off Ramp Speed		45			45		25		
Off Ramp Cap (pcph)		2,100			2,100		3,800		
Off Ramp v/c ratio		0.25			0.46		0.17		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps									
Up Type					On		Off		
Up Distance					1,500		2,550		
Up Flow (pcph)					1,162		973		
Down Type					On		No		
Down Distance					2,300				
Down Flow (pcph)					1,012				
Calculate Merge Influence Area Operations									
Effective V _p (pcph)				2,942					3,466
Up Ramp L _{EQ}									
Down Ramp L _{EQ}									
P _{FM} (Eqn 13-3)				0.588					0.602
P _{FM} (Eqn 13-4)							#VALUE!		
P _{FM} (Eqn 13-5)									
P _{FM}				1,000					1,000
V ₁₂ (pcph)				2,942					3,466
V ₅ (pcph)									
V _{5a} (pcph)									
V _{12a} (pcph)				2,942					3,466
V _{12b} (pcph)				4,124					4,478
Merge Speed Index				0.54					0.59
Merge Area Speed				52.5					51.5
Outer Lanes Volume									
Outer Lanes Speed									
Segment Speed				52.5					51.5
Merge v/c ratio				0.90					0.97
Merge Density				34.7					34.4
Merge LOS				D					D



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hillid Blvd on-ramp
Calculate Diverge Influence Area Operations									
Effective v_p (pcph)		3,403							
Up Ramp L_{EO}									
Down Ramp L_{EO}									
P_{FD} (Eqn 13-9)		0.851							
P_{FD} (Eqn 13-10)									
P_{FD} (Eqn 13-11)									
P_{FD}		1,000							
v_{12} (pcph)		3,403							
v_2 (pcph)									
v_{24} (pcph)									
v_{24} (pcph)		3,403							
Diverge Speed Index		0.34							
Diverge Area Speed		57.1							
Outer Lanes Volume									
Outer Lanes Speed									
Segment Speed		57.1							
Diverge v/c ratio		0.77							
Diverge Density		32.2							
Diverge LOS		D							
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments									
On to Off Volume (vph)					380		23		
PHF					0.94		0.94		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					2.5%		1.0%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					0.988		0.995		
f_p					1.00		1.00		
On to Off Flow (pcph)					409		24		
Calculate On Ramp to Mainline Flow Rate for Weave Segments									
On to ML Volume (vph)					380		98		
PHF					0.89		0.93		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					3.0%		0.0%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					0.985		1.000		
f_p					1.00		1.00		
On to ML Flow (pcph)					433		106		
Calculate Mainline to Off Ramp Flow Rate for Weave Segments									
ML to Off Volume (vph)					459		565		
PHF					0.87		0.92		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					2.0%		2.0%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					0.990		0.990		
f_p					1.00		1.00		
ML to Off Flow (pcph)					532		621		
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments									
GP to GP Volume (vph)					3,294		3,117		
PHF					0.94		0.94		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					1.0%		1.0%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					0.995		0.995		
f_p					1.00		1.00		
GP to GP Flow (pcph)					3,521		3,332		

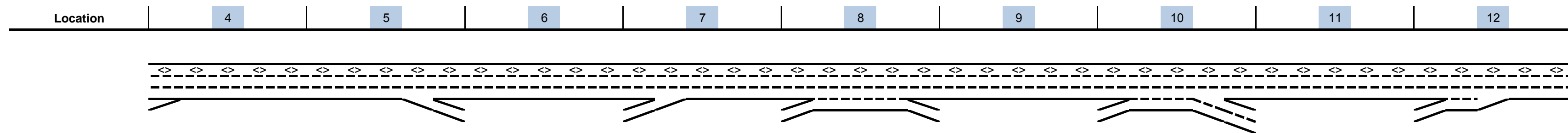


Key
 <-> Express Lane (HOV)
 - - - No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hillid Blvd on-ramp
Calculate Weave Segment Operations									
Weave Type					One-sided		One-sided		
Weave Length					5,500		1,800		
Segment Lanes					2		2		
Weave Lanes					2		2		
Weave Flow (pcph)					965		726		
Non-Weave Flow					3,930		3,356		
Segment Flow					4,895		4,083		
Max Weave Length					4,507		4,312		
Length Check					Not a Weave		OK		
Ideal Weave Capacity					2,426		2,158		
f_{lv}					0.993		0.994		
f_p					0.999		1.000		
Capacity Condition 1					4,812		4,292		
Capacity Condition 2					12,073		13,413		
Weave v/c ratio					1.01		0.95		
Interchange Density					2		1		
Lane Changes On to ML					1		1		
Lane Changes ML to Off					1		0		
Lane Changes On to Off					0		0		
Min Lane Change Rate					965		106		
Weave LC Rate					3,045		761		
Non-Weave LC Rate 1					3,405		1,282		
Non-Weave LC Rate 2					2,565		2,437		
Non-Weave LC Rate 3					-502		45		
Segment LC Rate					5,610		2,043		
Weave Intensity Factor					0.230		0.250		
Weave Speed					55.7		55.0		
Non-Weave Speed					46.3		54.4		
Segment Speed					47.9		54.5		
Weave Density					-		37.4		
Weave LOS					Basic		E		
Summarize Segment Operations									
Segment v/c ratio	0.72	0.77	0.66	0.90	0.88	0.84	0.95	0.74	0.97
Segment Density	26.7	32.2	24.0	34.7	25.0	32.6	37.4	27.6	34.4
Segment LOS	D	D	C	D	C	D	E	D	D
Over Capacity									

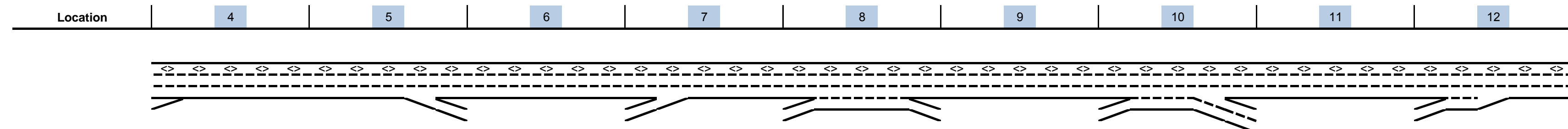
Alternative: Existing Plus Project Conditions (MIT)
Time Period: PM Peak Hour

Data Entry Value
Calculated Value



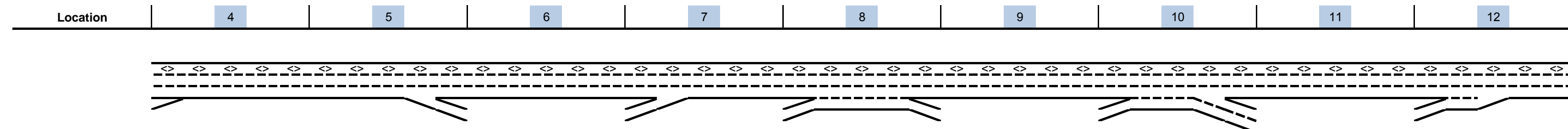
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hilld Blvd on-ramp
Define Freeway Segment									
Type	Basic	Diverge	Basic	Merge	Weave	Basic	Weave	Basic	Merge
Length (ft)	4,900	1,500	2,350	1,500	6,500	2,550	2,800	2,300	1,500
Accel Length				375					880
Decel Length		150							
Mainline Volume	2,632	2,632	2,171	2,171	2,880	2,518	2,518	2,180	2,180
On Ramp Volume				709	247		112		1,078
Off Ramp Volume		461			609		450		
Express Lane Volume	211	211	174	174	230	201	201	174	174
EL On Ramp Volume									
EL Off Ramp Volume									
Calculate Flow Rate in General Purpose Lanes (GP)									
GP Volume (vph)	2,421	2,421	1,997	2,706	2,897	2,317	2,429	2,006	3,084
PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
GP Lanes	2	2	2	2	3	2	3	2	2
Terrain	Level	Level	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GP Flow (pcph)	2,548	2,548	2,101	2,847	3,047	2,437	2,555	2,110	3,244
GP Flow (pcphpl)	1,274	1,274	1,051	1,424	1,016	1,219	852	1,055	1,622
Calculate Speed in General Purpose Lanes									
Lane Width (ft)	12	12	12	12	12	12	12	12	12
Shoulder Width	>6	>6	>6	>6	>6	>6	>6	>6	>6
TRD	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0
f _{lw}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
f _{lc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calc'd FFS	69.6	69.6	69.6	69.6	69.6	69.6	69.6	67.3	67.3
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65
Calculate Operations in General Purpose Lanes									
v/c ratio	0.54	0.54	0.45	0.61	0.43	0.52	0.36	0.45	0.69
Speed (mph)	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	64.3
Density (pcphpl)	19.6	19.6	16.2	21.9	15.6	18.7	13.1	16.2	25.2
LOS	C	C	B	C	B	C	B	B	C
Calculate Operations for Entering GP Lanes									
GP _{IN} Vol (pcph)				2,101	2,788		2,431		2,127
GP _{IN} Cap (pcph)				4,700	4,700		4,700		4,700
GP _{IN} v/c ratio				0.45	0.59		0.52		0.45
Calculate Operations for Exiting GP Lanes									
GP _{OUT} Vol (pcph)		1,943			2,371		2,089		
GP _{OUT} Cap (pcph)		4,700			4,700		4,700		
GP _{OUT} v/c ratio		0.41			0.50		0.44		



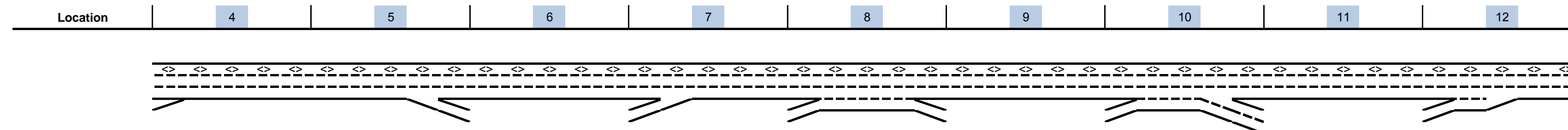
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Flow Rate in Express Lanes (EL)									
EL Volume (vph)	211	211	174	174	230	201	201	174	174
PHF	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Express Lanes	1	1	1	1	1	1	1	1	1
Terrain	Level	Level	Level	Level	Level	Level	Level	Level	Level
Grade %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Grade Length (mi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck & Bus %	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
RV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E _T	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E _R	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
f _{sv}	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990	0.990
f _p	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EL Flow (pcph)	236	236	195	195	259	226	226	196	196
EL Flow (pcphpl)	236	236	195	195	259	226	226	196	196
Calculate Speed in Express Lanes									
Lane Width (ft)									
Shoulder Width									
TRD									
f _{lw}									
f _{lc}									
Calc'd FFS									
Measured FFS	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
FFS	65	65	65	65	65	65	65	65	65
Calculate Operations in Express Lanes									
EL _{sv} v/c ratio	0.14	0.14	0.11	0.11	0.15	0.13	0.13	0.11	0.11
Calculate On Ramp Flow Rate									
On Volume (vph)				709	247		112		1,078
PHF				0.96	0.96		0.9		0.97
Total Lanes				1	1		1		1
Terrain				Level	Level		Level		Level
Grade %				0.0%	0.0%		0.0%		0.0%
Grade Length (mi)				0.00	0.00		0.00		0.00
Truck & Bus %				2.0%	2.0%		0.0%		1.0%
RV %				0.0%	0.0%		0.0%		0.0%
E _T				1.5	1.5		1.5		1.5
E _R				1.2	1.2		1.2		1.2
f _{sv}				0.990	0.990		1.000		0.995
f _p				1.00	1.00		1.00		1.00
On Flow (pcph)				746	260		124		1,117
On Flow (pcphpl)				746	260		124		1,117
Calculate On Ramp Roadway Operations									
On Ramp Type				Right	Right		Right		Right
On Ramp Speed (mph)				25	45		45		45
On Ramp Cap (pcph)				1,900	2,100		2,100		2,100
On Ramp v/c ratio				0.39	0.12		0.06		0.53



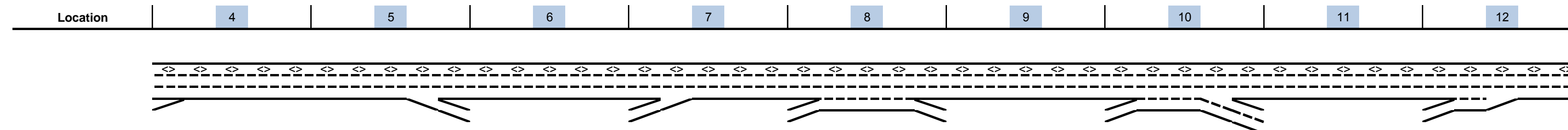
Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Off Ramp Flow Rate									
Off Volume (vph)		461			609		450		
PHF		0.77			0.9		0.97		
Total Lanes		1			1		2		
Terrain		Level			Level		Level		
Grade %		0.0%			0.0%		0.0%		
Grade Length (mi)		0.00			0.00		0.00		
Truck & Bus %		2.0%			0.0%		1.0%		
RV %		0.0%			0.0%		0.0%		
E _T		1.5			1.5		1.5		
E _R		1.2			1.2		1.2		
f _{RV}		0.990			1.000		0.995		
f _p		1.00			1.00		1.00		
Off Flow (pcph)		605			677		466		
Off Flow (pcphpl)		605			677		233		
Calculate Off Ramp Roadway Operations									
Off Ramp Type		Right			Right		Right		
Off Ramp Speed		45			45		25		
Off Ramp Cap (pcph)		2,100			2,100		3,800		
Off Ramp v/c ratio		0.29			0.32		0.12		
Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps									
Up Type					On		Off		
Up Distance					1,500		2,550		
Up Flow (pcph)					746		677		
Down Type					On		No		
Down Distance					2,300				
Down Flow (pcph)					1,117				
Calculate Merge Influence Area Operations									
Effective v _p (pcph)				2,101					2,127
Up Ramp L _{EQ}									
Down Ramp L _{EQ}									
P _{FM} (Eqn 13-3)				0.588					0.602
P _{FM} (Eqn 13-4)							#VALUE!		
P _{FM} (Eqn 13-5)									
P _{FM}				1.000					1.000
v ₁₂ (pcph)				2,101					2,127
v ₃ (pcph)									
v ₃₄ (pcph)									
v _{12a} (pcph)				2,101					2,127
v _{R12a} (pcph)				2,847					3,244
Merge Speed Index				0.37					0.34
Merge Area Speed				56.5					57.1
Outer Lanes Volume									
Outer Lanes Speed									
Segment Speed				56.5					57.1
Merge v/c ratio				0.62					0.71
Merge Density				25.0					24.7
Merge LOS				C					C



Key
 <-> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate Diverge Influence Area Operations									
Effective v_p (pcph)		2,548							
Up Ramp L_{EQ}									
Down Ramp L_{EQ}									
P_{FD} (Eqn 13-9)		0.668							
P_{FD} (Eqn 13-10)									
P_{FD} (Eqn 13-11)									
P_{FD}		1.000							
v_{12} (pcph)		2,548							
v_3 (pcph)									
v_{34} (pcph)									
v_{123} (pcph)		2,548							
Diverge Speed Index		0.35							
Diverge Area Speed		56.9							
Outer Lanes Volume									
Outer Lanes Speed									
Segment Speed		56.9							
Diverge v/c ratio		0.58							
Diverge Density		24.8							
Diverge LOS		C							
Calculate On Ramp to Off Ramp Flow Rate for Weave Segments									
On to Off Volume (vph)					89		47		
PHF					0.96		0.96		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					2.0%		0.5%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					0.990		0.998		
f_p					1.00		1.00		
On to Off Flow (pcph)					94		49		
Calculate On Ramp to Mainline Flow Rate for Weave Segments									
On to ML Volume (vph)					158		65		
PHF					0.96		0.9		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					2.0%		0.0%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					0.990		1.000		
f_p					1.00		1.00		
On to ML Flow (pcph)					166		73		
Calculate Mainline to Off Ramp Flow Rate for Weave Segments									
ML to Off Volume (vph)					520		403		
PHF					0.9		0.97		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					0.0%		1.0%		
RV %					0.0%		0.0%		
E_T					1.5		1.5		
E_R					1.2		1.2		
f_{HV}					1.000		0.995		
f_p					1.00		1.00		
ML to Off Flow (pcph)					578		418		



Key
 <> Express Lane (HOV)
 No Trucks

Name	Cambridge Rd to Bass Lake Rd	Bass Lake Rd off-ramp	Bass Lake Rd off to on-ramp	Bass Lake Rd on-ramp (loop)	Bass Lake Rd to Silva Valley Pkwy	Silva Valley Pkwy off to on-ramp	Silva Valley Pkwy to El Dorado Hills Blvd	El Dorado Hills Blvd off to on	El Dorado Hills Blvd on-ramp
Calculate General Purpose Lanes to General Purpose Lanes Flow Rate for Weave Segments									
GP to GP Volume (vph)					2,130		1,913		
PHF					0.96		0.96		
Terrain					Level		Level		
Grade %					0.0%		0.0%		
Grade Length (mi)					0.00		0.00		
Truck & Bus %					2.0%		2.0%		
RV %					0.0%		0.0%		
E _T					1.5		1.5		
E _R					1.2		1.2		
f _{RV}					0.990		0.990		
f _p					1.00		1.00		
GP to GP Flow (pcph)					2,240		2,013		
Calculate Weave Segment Operations									
Weave Type					One-sided		One-sided		
Weave Length					5,500		1,800		
Segment Lanes					2		2		
Weave Lanes					2		2		
Weave Flow (pcph)					744		490		
Non-Weave Flow					2,334		2,062		
Segment Flow					3,078		2,552		
Max Weave Length					4,968		4,456		
Length Check					Not a Weave		OK		
Ideal Weave Capacity					2,391		2,147		
f _{RV}					0.992		0.991		
f _p					0.999		1.000		
Capacity Condition 1					4,740		4,256		
Capacity Condition 2					9,842		12,382		
Weave v/c ratio					0.64		0.59		
Interchange Density					2		2		
Lane Changes On to ML					1		1		
Lane Changes ML to Off					1		0		
Lane Changes On to Off					0		0		
Min Lane Change Rate					744		73		
Weave LC Rate					2,824		709		
Non-Weave LC Rate 1					3,077		1,015		
Non-Weave LC Rate 2					2,209		2,149		
Non-Weave LC Rate 3					1,386		42		
Segment LC Rate					5,034		1,725		
Weave Intensity Factor					0.211		0.218		
Weave Speed					56.3		56.0		
Non-Weave Speed					52.3		58.4		
Segment Speed					53.2		57.9		
Weave Density					-		22.0		
Weave LOS					Basic		C		
Summarize Segment Operations									
Segment v/c ratio	0.54	0.58	0.45	0.62	0.43	0.52	0.59	0.45	0.71
Segment Density	19.6	24.8	16.2	25.0	15.6	18.7	22.0	16.2	24.7
Segment LOS	C	C	B	C	B	C	C	B	C
Over Capacity									

Leisch Method for Weaving Analysis

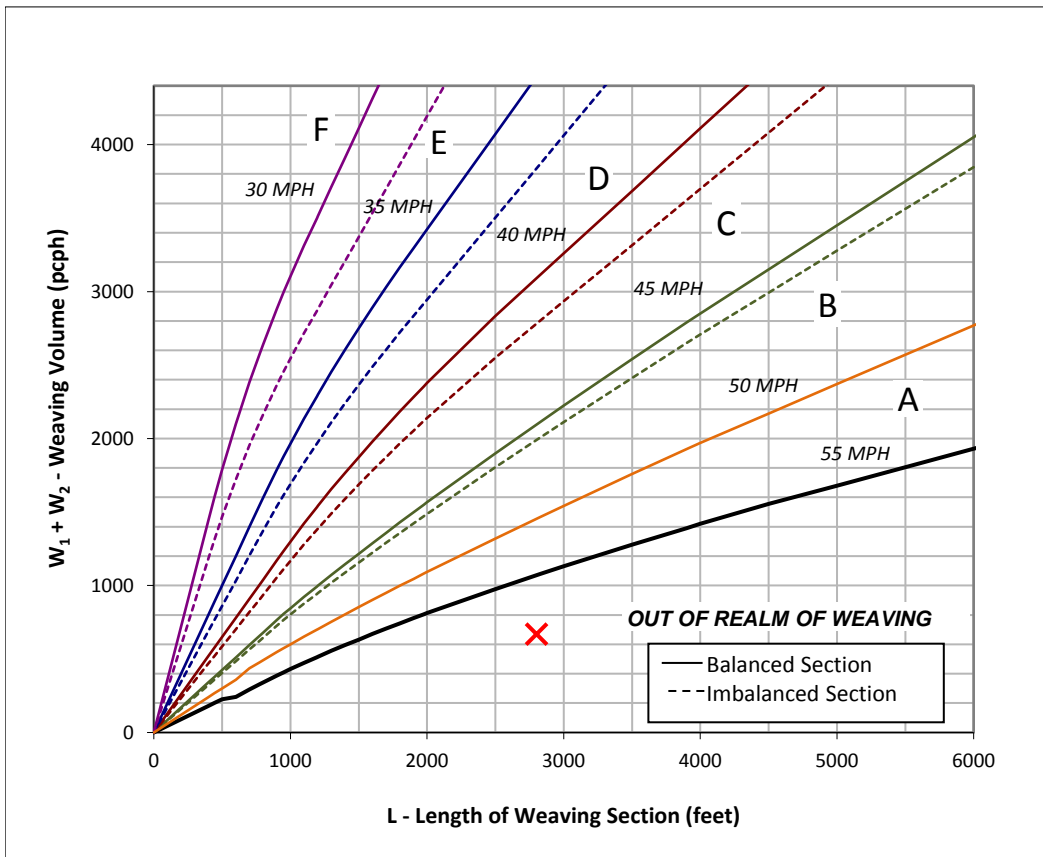
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	2,800

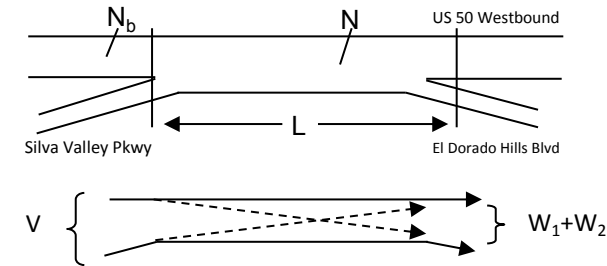
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project (Mitigated) AM Peak Hour
Freeway	US 50 Westbound
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,258	Volume (vph)*	98	Volume (vph)*	565
Truck Percentage	2%	Truck Percentage	0%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,301	Volume (pcph)	98	Volume (pcph)	571



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

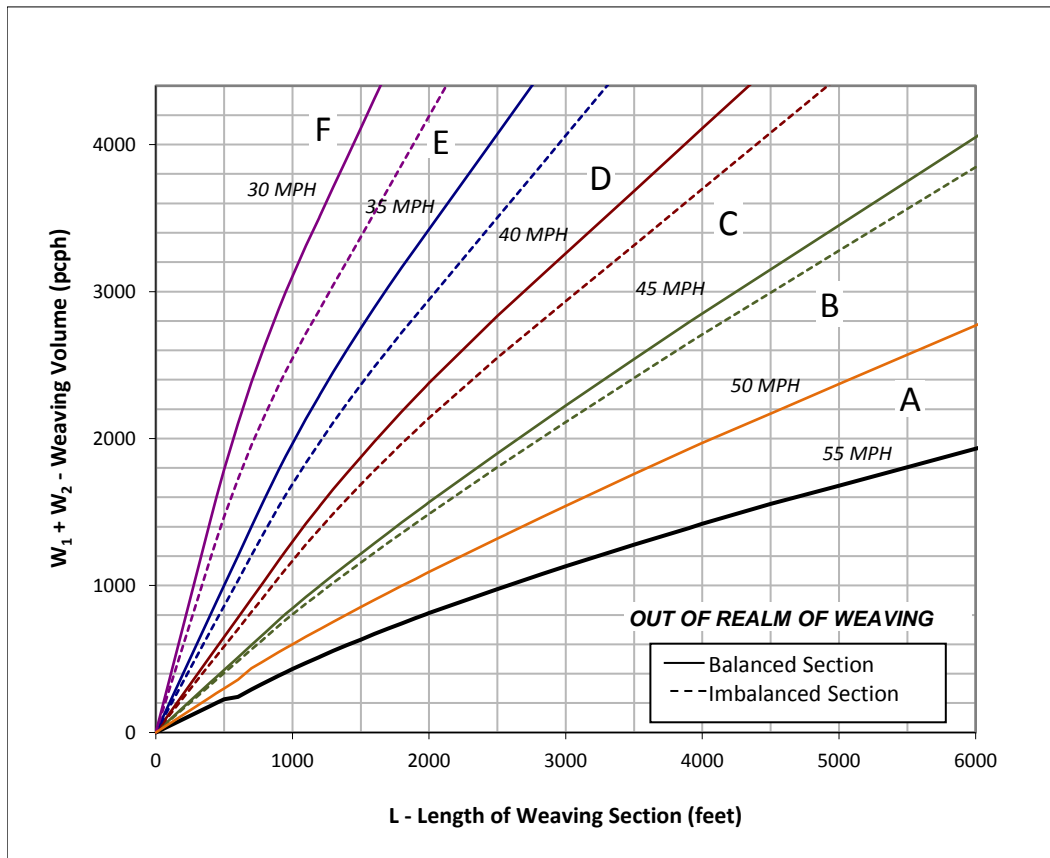
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	6,500

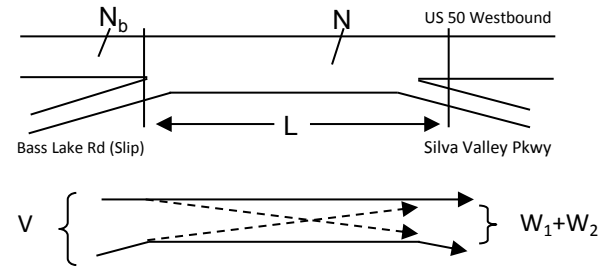
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project (Mitigated) AM Peak Hour
Freeway	US 50 Westbound
On-ramp	Bass Lake Rd (Slip)
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,975	Volume (vph)*	380	Volume (vph)*	459
Truck Percentage	1%	Truck Percentage	2%	Truck Percentage	2%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	5,000	Volume (pcph)	384	Volume (pcph)	464



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
2. In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
3. Interpolated Weaving Speed (S_w , mph) -
4. Weaving Intensity Factor (k) -
5. Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
6. Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

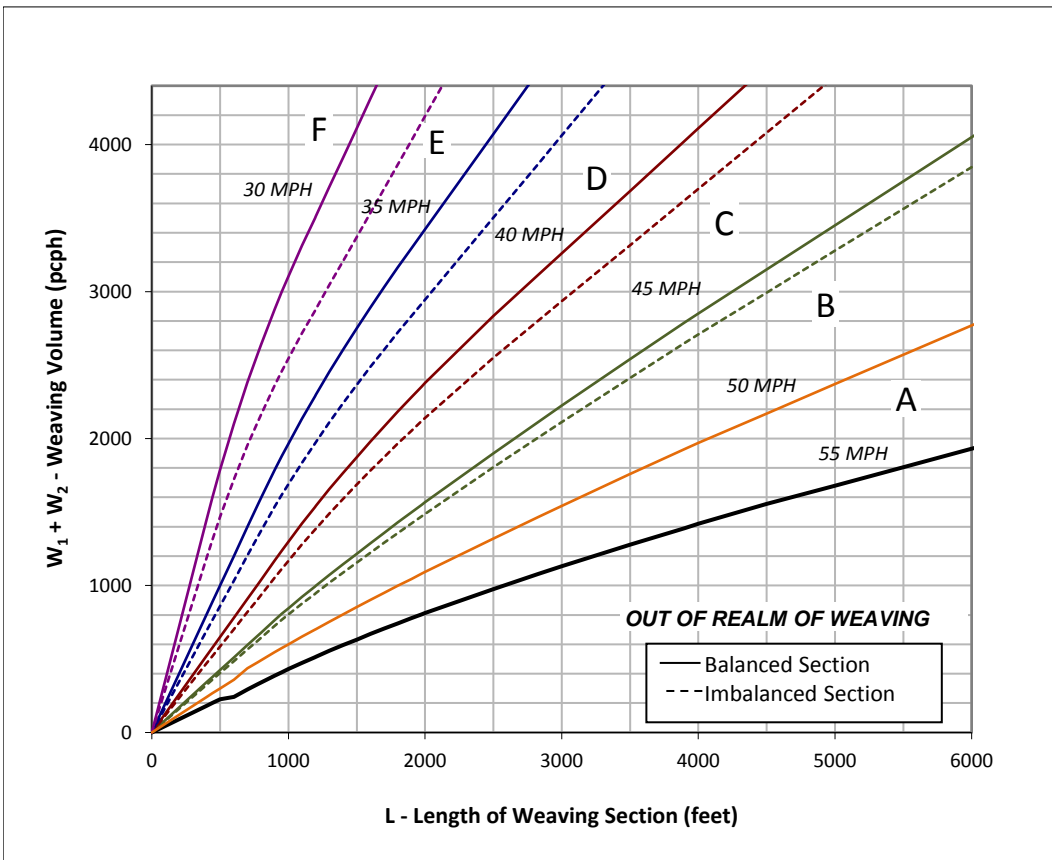
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	6,500

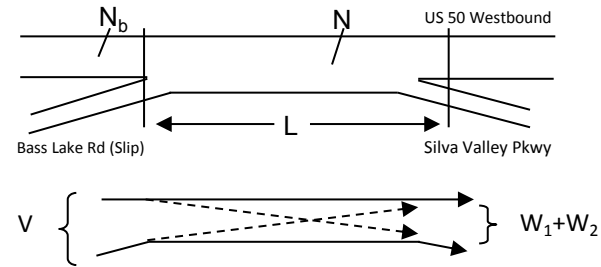
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project (Mitigated) PM Peak Hour
Freeway	US 50 Westbound
On-ramp	Bass Lake Rd (Slip)
Off-ramp	Silva Valley Pkwy

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,127	Volume (vph)*	158	Volume (vph)*	520
Truck Percentage	2%	Truck Percentage	2%	Truck Percentage	0%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,158	Volume (pcph)	160	Volume (pcph)	520



Figure



Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between? 55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, 2014

Leisch Method for Weaving Analysis

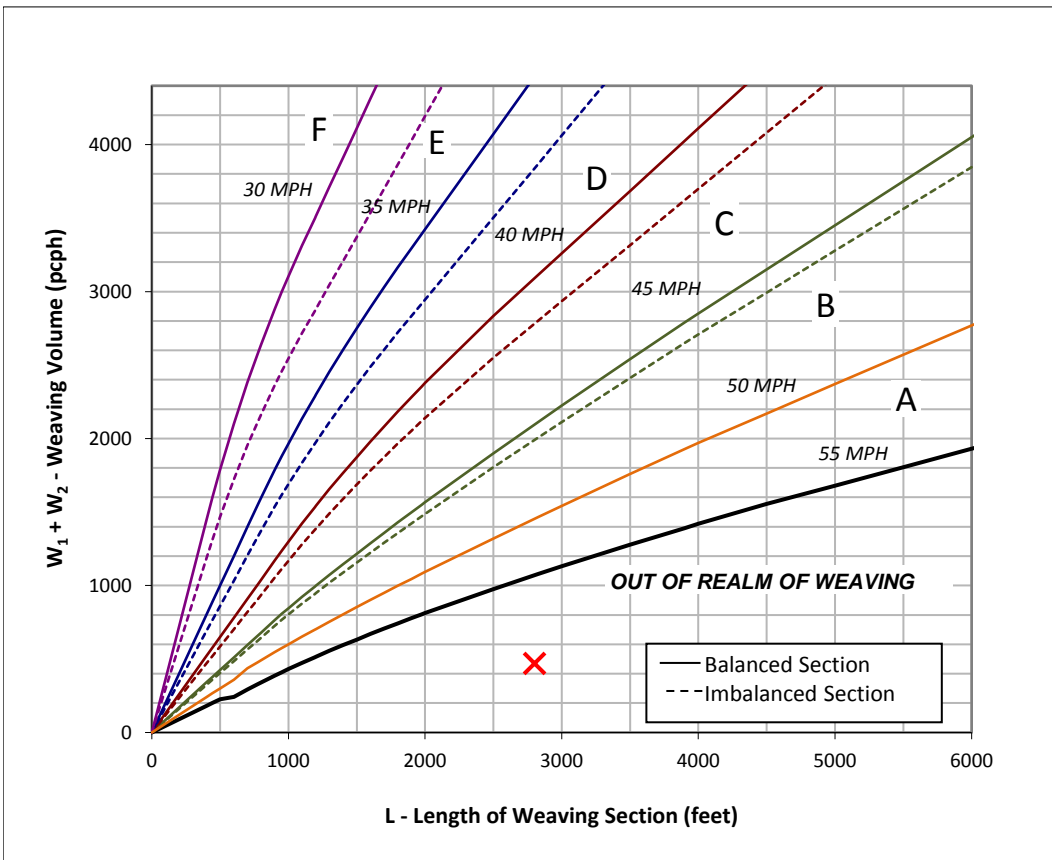
Data Input

Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	2
Length of Weaving Section (feet)	L	2,800

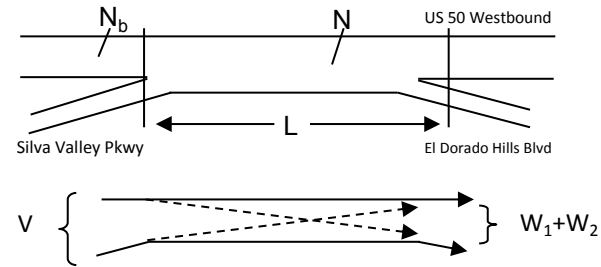
Project Information

Project	Marble Valley EIR
Scenario	Existing Plus Project (Mitigated) PM Peak Hour
Freeway	US 50 Westbound
On-ramp	Silva Valley Pkwy
Off-ramp	El Dorado Hills Blvd

Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	2,630	Volume (vph)*	65	Volume (vph)*	403
Truck Percentage	2%	Truck Percentage	0%	Truck Percentage	1%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	2,656	Volume (pcph)	65	Volume (pcph)	405



Figure






















Capacity Analysis

- Is the weaving section balanced (Y / N)? Y
If optional exit lane, then "Y". Otherwise "N".
- In the chart to the left, which two speed curves is the red "x" between?
55 MPH and -
If left of the 30 MPH curve, LOS is F. Select "-".
If below the 55 MPH curve, out of the realm of weaving.
- Interpolated Weaving Speed (S_w , mph) -
- Weaving Intensity Factor (k) -
- Service Volume (SV, pcph)
 $SV = (1/N) * [V + (k - 1) * \min(W_1, W_2)]$ -
- Level of Service (LOS) F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.
 * Note: **Do not adjust by a Peak Hour Factor (PHF)**. The methodology incorporates the PHF in the Service Volume tables.
 Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and
Highway Design Manual, California Department of Transportation, 2014

HCM 2010 Signalized Intersection Summary
5: Bass Lake Road & US 50 WB Ramps

Cumulative Plus Project Conditions (Mitigated)
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	20	10	250	0	730	980	0	550	550
Future Volume (veh/h)	0	0	0	20	10	250	0	730	980	0	550	550
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1827	1827	1827	0	1845	1845	0	1863	1863
Adj Flow Rate, veh/h				16	18	0	0	768	0	0	579	0
Adj No. of Lanes				1	1	1	0	2	1	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				4	4	4	0	3	3	0	2	2
Cap, veh/h				57	60	51	0	3079	1377	0	3109	1391
Arrive On Green				0.03	0.03	0.00	0.00	1.00	0.00	0.00	0.88	0.00
Sat Flow, veh/h				1740	1827	1553	0	3597	1568	0	3632	1583
Grp Volume(v), veh/h				16	18	0	0	768	0	0	579	0
Grp Sat Flow(s),veh/h/ln				1740	1827	1553	0	1752	1568	0	1770	1583
Q Serve(g_s), s				0.8	0.9	0.0	0.0	0.0	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s				0.8	0.9	0.0	0.0	0.0	0.0	0.0	2.1	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				57	60	51	0	3079	1377	0	3109	1391
V/C Ratio(X)				0.28	0.30	0.00	0.00	0.25	0.00	0.00	0.19	0.00
Avail Cap(c_a), veh/h				657	690	587	0	3079	1377	0	3109	1391
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	0.30	0.00	0.00	0.39	0.00
Uniform Delay (d), s/veh				42.5	42.5	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Incr Delay (d2), s/veh				2.7	2.8	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.4	0.5	0.0	0.0	0.0	0.0	0.0	1.0	0.0
LnGrp Delay(d),s/veh				45.2	45.3	0.0	0.0	0.1	0.0	0.0	0.8	0.0
LnGrp LOS				D	D			A			A	
Approach Vol, veh/h					34			768			579	
Approach Delay, s/veh					45.2			0.1			0.8	
Approach LOS					D			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		83.1				83.1		6.9				
Change Period (Y+Rc), s		4.0				4.0		4.0				
Max Green Setting (Gmax), s		48.0				48.0		34.0				
Max Q Clear Time (g_c+I1), s		2.0				4.1		2.9				
Green Ext Time (p_c), s		11.7				11.6		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				1.5								
HCM 2010 LOS				A								
Notes												

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary Cumulative Plus Project Conditions (Mitigated)
 6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	10	470	0	0	0	0	1360	10	310	260	0
Future Volume (veh/h)	350	10	470	0	0	0	0	1360	10	310	260	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1827				0	1827	1827	1863	1863	0
Adj Flow Rate, veh/h	414	0	92				0	1432	11	326	274	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	2	2	0
Cap, veh/h	548	0	243				0	1350	602	568	2668	0
Arrive On Green	0.16	0.00	0.16				0.00	0.39	0.39	0.54	1.00	0.00
Sat Flow, veh/h	3480	0	1547				0	3563	1549	1774	3632	0
Grp Volume(v), veh/h	414	0	92				0	1432	11	326	274	0
Grp Sat Flow(s),veh/h/ln	1827	0	1547				0	1736	1549	1774	1770	0
Q Serve(g_s), s	10.2	0.0	4.8				0.0	35.0	0.4	11.1	0.0	0.0
Cycle Q Clear(g_c), s	10.2	0.0	4.8				0.0	35.0	0.4	11.1	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	548	0	243				0	1350	602	568	2668	0
V/C Ratio(X)	0.76	0.00	0.38				0.00	1.06	0.02	0.57	0.10	0.00
Avail Cap(c_a), veh/h	1083	0	481				0	1350	602	568	2668	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	36.3	0.0	34.0				0.0	27.5	16.9	16.8	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	1.0				0.0	42.4	0.1	1.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	2.1				0.0	24.6	0.2	5.5	0.0	0.0
LnGrp Delay(d),s/veh	38.4	0.0	34.9				0.0	69.9	17.0	18.2	0.1	0.0
LnGrp LOS	D		C					F	B	B	A	
Approach Vol, veh/h		506						1443			600	
Approach Delay, s/veh		37.8						69.5			9.9	
Approach LOS		D						E			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	32.8	39.0		18.2		71.8						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	35.0	35.0		28.0		54.0						
Max Q Clear Time (g_c+I1), s	37.0	37.0		12.2		2.0						
Green Ext Time (p_c), s	0.6	0.0		1.6		3.0						
Intersection Summary												
HCM 2010 Ctrl Delay			49.2									
HCM 2010 LOS			D									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	40	10	1370	710	10
Future Vol, veh/h	0	40	10	1370	710	10
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	12	12	8	8
Mvmt Flow	0	42	11	1442	747	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1499	383	760	0	-	0
Stage 1	755	-	-	-	-	-
Stage 2	744	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.34	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.32	-	-	-
Pot Cap-1 Maneuver	113	615	785	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	431	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	111	613	784	-	-	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	424	-	-	-	-	-
Stage 2	424	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	784	-	613	-	-
HCM Lane V/C Ratio	0.013	-	0.069	-	-
HCM Control Delay (s)	9.7	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Traffic Vol, veh/h	740	10	10	1380	0	20
Future Vol, veh/h	740	10	10	1380	0	20
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	779	11	11	1453	0	21



















Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	791
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	825
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	824
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	599	-	-	824	-
HCM Lane V/C Ratio	0.035	-	-	0.013	-
HCM Control Delay (s)	11.2	-	-	9.4	0.3
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-























HCM 2010 Signalized Intersection Summary
9: Cambridge Road & Country Club Drive

Cumulative Plus Project Conditions (Mitigated)
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	10	30	80	30	10	20	360	30	20	560	150
Future Volume (veh/h)	90	10	30	80	30	10	20	360	30	20	560	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	161	18	54	138	52	17	26	462	38	24	675	181
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.56	0.56	0.56	0.58	0.58	0.58	0.78	0.78	0.78	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	34	71	285	97	26	41	992	82	38	825	221
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.02	0.58	0.58	0.02	0.58	0.58
Sat Flow, veh/h	971	161	342	921	465	124	1774	1698	140	1774	1415	380
Grp Volume(v), veh/h	233	0	0	207	0	0	26	0	500	24	0	856
Grp Sat Flow(s),veh/h/ln	1474	0	0	1510	0	0	1774	0	1838	1774	0	1795
Q Serve(g_s), s	1.5	0.0	0.0	0.0	0.0	0.0	0.9	0.0	10.0	0.9	0.0	24.5
Cycle Q Clear(g_c), s	9.4	0.0	0.0	7.9	0.0	0.0	0.9	0.0	10.0	0.9	0.0	24.5
Prop In Lane	0.69		0.23	0.67		0.08	1.00		0.08	1.00		0.21
Lane Grp Cap(c), veh/h	401	0	0	407	0	0	41	0	1074	38	0	1046
V/C Ratio(X)	0.58	0.00	0.00	0.51	0.00	0.00	0.63	0.00	0.47	0.62	0.00	0.82
Avail Cap(c_a), veh/h	588	0	0	600	0	0	110	0	1453	138	0	1447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	0.0	23.3	0.0	0.0	31.2	0.0	7.7	31.3	0.0	10.7
Incr Delay (d2), s/veh	1.3	0.0	0.0	1.0	0.0	0.0	15.1	0.0	0.3	15.4	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0	3.4	0.0	0.0	0.6	0.0	5.1	0.6	0.0	12.7
LnGrp Delay(d),s/veh	25.2	0.0	0.0	24.3	0.0	0.0	46.3	0.0	8.0	46.7	0.0	13.4
LnGrp LOS	C			C			D		A	D		B
Approach Vol, veh/h		233			207			526			880	
Approach Delay, s/veh		25.2			24.3			9.9			14.3	
Approach LOS		C			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	41.7		17.4	5.5	41.6		17.4				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.0	51.0		22.0	4.0	52.0		22.0				
Max Q Clear Time (g_c+I1), s	2.9	12.0		11.4	2.9	26.5		9.9				
Green Ext Time (p_c), s	0.0	13.0		2.0	0.0	11.1		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay				15.5								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary
10: Cambridge Road & Knollwood Drive

Cumulative Plus Project Conditions (Mitigated)
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	50	470	210	40	40	320	370	250	70	630	10
Future Volume (veh/h)	10	50	470	210	40	40	320	370	250	70	630	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	12	62	588	420	80	80	395	457	309	84	759	12
Adj No. of Lanes	0	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.80	0.80	0.80	0.50	0.50	0.50	0.81	0.81	0.81	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	38	196	608	443	213	213	458	802	680	106	829	13
Arrive On Green	0.13	0.13	0.13	0.25	0.25	0.25	0.09	0.14	0.14	0.06	0.23	0.23
Sat Flow, veh/h	300	1548	1576	1774	854	854	1774	1863	1580	1774	3566	56
Grp Volume(v), veh/h	74	0	588	420	0	160	395	457	309	84	377	394
Grp Sat Flow(s),veh/h/ln	1848	0	1576	1774	0	1708	1774	1863	1580	1774	1770	1853
Q Serve(g_s), s	4.4	0.0	12.8	27.9	0.0	9.3	26.4	27.5	21.5	5.6	24.9	24.9
Cycle Q Clear(g_c), s	4.4	0.0	12.8	27.9	0.0	9.3	26.4	27.5	21.5	5.6	24.9	24.9
Prop In Lane	0.16		1.00	1.00		0.50	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	234	0	608	443	0	426	458	802	680	106	412	431
V/C Ratio(X)	0.32	0.00	0.97	0.95	0.00	0.38	0.86	0.57	0.45	0.79	0.92	0.92
Avail Cap(c_a), veh/h	246	0	618	444	0	427	458	802	680	163	428	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.41	0.41	0.41	0.45	0.45	0.45
Uniform Delay (d), s/veh	47.7	0.0	36.2	44.3	0.0	37.3	52.8	41.1	38.5	55.7	44.9	44.9
Incr Delay (d2), s/veh	0.8	0.0	27.9	29.9	0.0	0.5	7.2	1.2	0.9	6.6	15.3	14.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	10.2	17.3	0.0	4.5	13.9	14.5	9.6	2.9	13.9	14.5
LnGrp Delay(d),s/veh	48.4	0.0	64.1	74.2	0.0	37.8	60.0	42.3	39.4	62.2	60.2	59.7
LnGrp LOS	D		E	E		D	E	D	D	E	E	E
Approach Vol, veh/h		662			580			1161			855	
Approach Delay, s/veh		62.3			64.2			47.6			60.1	
Approach LOS		E			E			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	55.7		19.2	35.0	31.9		34.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	11.0	47.0		16.0	29.0	29.0		30.0				
Max Q Clear Time (g_c+I1), s	7.6	29.5		14.8	28.4	26.9		29.9				
Green Ext Time (p_c), s	0.0	5.2		0.4	0.1	1.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			56.8									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary Cumulative Plus Project Conditions (Mitigated)
 11: Cambridge Road & Merrychase Drive/US 50 WB Ramps AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖↗	↖	↗	↖	↖↗	↗	↖	↖↗	
Traffic Volume (veh/h)	50	190	220	350	270	310	120	580	90	500	700	100
Future Volume (veh/h)	50	190	220	350	270	310	120	580	90	500	700	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	69	264	31	530	409	267	169	817	0	521	729	96
Adj No. of Lanes	0	1	1	2	1	1	1	2	1	1	2	0
Peak Hour Factor	0.72	0.72	0.72	0.66	0.66	0.66	0.71	0.71	0.71	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	64	244	263	739	388	743	223	796	356	473	1127	148
Arrive On Green	0.17	0.17	0.17	0.21	0.21	0.20	0.04	0.07	0.00	0.09	0.12	0.12
Sat Flow, veh/h	382	1462	1578	3548	1863	1579	1774	3539	1583	1774	3144	414
Grp Volume(v), veh/h	333	0	31	530	409	267	169	817	0	521	410	415
Grp Sat Flow(s),veh/h/ln	1844	0	1578	1774	1863	1579	1774	1770	1583	1774	1770	1788
Q Serve(g_s), s	20.0	0.0	2.0	16.7	25.0	12.9	11.3	27.0	0.0	32.0	26.6	26.6
Cycle Q Clear(g_c), s	20.0	0.0	2.0	16.7	25.0	12.9	11.3	27.0	0.0	32.0	26.6	26.6
Prop In Lane	0.21		1.00	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	307	0	263	739	388	743	223	796	356	473	634	641
V/C Ratio(X)	1.08	0.00	0.12	0.72	1.05	0.36	0.76	1.03	0.00	1.10	0.65	0.65
Avail Cap(c_a), veh/h	307	0	263	739	388	743	237	796	356	473	634	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.60	0.60	0.00	0.33	0.33	0.33
Uniform Delay (d), s/veh	50.0	0.0	42.5	44.2	47.5	20.3	55.7	55.5	0.0	54.7	45.7	45.7
Incr Delay (d2), s/veh	75.5	0.0	0.1	2.9	60.6	0.1	6.8	31.6	0.0	56.5	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	0.9	8.5	19.4	5.6	6.0	16.7	0.0	23.2	13.3	13.5
LnGrp Delay(d),s/veh	125.5	0.0	42.6	47.1	108.1	20.4	62.5	87.2	0.0	111.3	47.3	47.4
LnGrp LOS	F		D	D	F	C	E	F		F	D	D
Approach Vol, veh/h		364			1206			986			1346	
Approach Delay, s/veh		118.4			61.9			82.9			72.1	
Approach LOS		F			E			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.0	31.0		24.0	20.0	47.0		29.0				
Change Period (Y+Rc), s	3.5	4.4		4.1	4.4	* 4.4		4.1				
Max Green Setting (Gmax), s	32.5	26.6		19.9	16.5	* 43		24.9				
Max Q Clear Time (g_c+3.0), s	34.0	29.0		22.0	13.3	28.6		27.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	1.3	2.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			76.0									
HCM 2010 LOS			E									
Notes												

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



















HCM 2010 Signalized Intersection Summary Cumulative Plus Project Conditions (Mitigated)
 13: Flying C Road & Crazy Horse Road & Cambridge Road AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕↔		↕	↑	↕
Traffic Volume (veh/h)	90	10	10	30	10	140	10	710	20	110	450	40
Future Volume (veh/h)	90	10	10	30	10	140	10	710	20	110	450	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	134	15	15	42	14	197	11	747	21	116	474	42
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	1	1
Peak Hour Factor	0.67	0.67	0.67	0.71	0.71	0.71	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	161	18	18	47	16	221	18	1201	34	423	1061	900
Arrive On Green	0.11	0.11	0.11	0.18	0.18	0.18	0.01	0.34	0.34	0.48	1.00	1.00
Sat Flow, veh/h	1439	161	161	269	90	1263	1774	3516	99	1774	1863	1581
Grp Volume(v), veh/h	164	0	0	253	0	0	11	376	392	116	474	42
Grp Sat Flow(s),veh/h/ln	1761	0	0	1621	0	0	1774	1770	1845	1774	1863	1581
Q Serve(g_s), s	10.9	0.0	0.0	18.3	0.0	0.0	0.7	21.3	21.3	4.7	0.0	0.0
Cycle Q Clear(g_c), s	10.9	0.0	0.0	18.3	0.0	0.0	0.7	21.3	21.3	4.7	0.0	0.0
Prop In Lane	0.82		0.09	0.17		0.78	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	197	0	0	284	0	0	18	605	630	423	1061	900
V/C Ratio(X)	0.83	0.00	0.00	0.89	0.00	0.00	0.61	0.62	0.62	0.27	0.45	0.05
Avail Cap(c_a), veh/h	293	0	0	351	0	0	59	605	630	423	1061	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.88	0.88	0.88
Uniform Delay (d), s/veh	52.2	0.0	0.0	48.4	0.0	0.0	59.1	33.0	33.0	25.2	0.0	0.0
Incr Delay (d2), s/veh	12.2	0.0	0.0	20.6	0.0	0.0	28.4	4.8	4.6	0.3	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.0	0.0	9.8	0.0	0.0	0.5	11.2	11.7	2.4	0.4	0.0
LnGrp Delay(d),s/veh	64.4	0.0	0.0	68.9	0.0	0.0	87.5	37.8	37.6	25.5	1.2	0.1
LnGrp LOS	E			E			F	D	D	C	A	A
Approach Vol, veh/h		164			253			779			632	
Approach Delay, s/veh		64.4			68.9			38.4			5.6	
Approach LOS		E			E			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.6	45.0		17.4	5.2	72.4		25.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	7.0	41.0		20.0	4.0	54.0		26.0				
Max Q Clear Time (g_c+10), s	7.5	23.3		12.9	2.7	2.0		20.3				
Green Ext Time (p_c), s	2.6	4.6		0.4	0.0	3.9		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			33.6									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
5: Bass Lake Road & US 50 WB Ramps

Cumulative Plus Project Conditions (Mitigated)
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	120	10	390	0	640	710	0	640	450
Future Volume (veh/h)	0	0	0	120	10	390	0	640	710	0	640	450
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1827	1827	0	1845	1845	0	1863	1863
Adj Flow Rate, veh/h				126	11	0	0	667	0	0	667	0
Adj No. of Lanes				0	1	1	0	2	1	0	1	1
Peak Hour Factor				0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				4	4	4	0	3	3	0	2	2
Cap, veh/h				176	15	170	0	2771	1240	0	1473	1252
Arrive On Green				0.11	0.11	0.00	0.00	1.00	0.00	0.00	0.79	0.00
Sat Flow, veh/h				1606	140	1553	0	3597	1568	0	1863	1583
Grp Volume(v), veh/h				137	0	0	0	667	0	0	667	0
Grp Sat Flow(s),veh/h/ln				1747	0	1553	0	1752	1568	0	1863	1583
Q Serve(g_s), s				6.1	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0
Cycle Q Clear(g_c), s				6.1	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0
Prop In Lane				0.92		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				191	0	170	0	2771	1240	0	1473	1252
V/C Ratio(X)				0.72	0.00	0.00	0.00	0.24	0.00	0.00	0.45	0.00
Avail Cap(c_a), veh/h				611	0	544	0	2771	1240	0	1473	1252
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.40	0.00	0.00	0.78	0.00
Uniform Delay (d), s/veh				34.4	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0
Incr Delay (d2), s/veh				5.0	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.2	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0
LnGrp Delay(d),s/veh				39.4	0.0	0.0	0.0	0.1	0.0	0.0	3.5	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h					137			667			667	
Approach Delay, s/veh					39.4			0.1			3.5	
Approach LOS					D			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		67.2				67.2		12.8				
Change Period (Y+Rc), s		4.0				4.0		4.0				
Max Green Setting (Gmax), s		44.0				44.0		28.0				
Max Q Clear Time (g_c+I1), s		2.0				11.3		8.1				
Green Ext Time (p_c), s		11.6				10.8		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				5.3								
HCM 2010 LOS				A								

HCM 2010 Signalized Intersection Summary Cumulative Plus Project Conditions (Mitigated)
 6: Marble Valley Road/Bass Lake Road & US 50 EB Ramps PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	10	1000	0	0	0	0	890	10	350	410	0
Future Volume (veh/h)	460	10	1000	0	0	0	0	890	10	350	410	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1827				0	1827	1827	1863	1863	0
Adj Flow Rate, veh/h	651	0	339				0	937	10	368	432	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4				0	4	4	2	2	0
Cap, veh/h	927	0	413				0	998	445	525	2243	0
Arrive On Green	0.27	0.00	0.27				0.00	0.29	0.29	0.59	1.00	0.00
Sat Flow, veh/h	3480	0	1549				0	3563	1547	1774	3632	0
Grp Volume(v), veh/h	651	0	339				0	937	10	368	432	0
Grp Sat Flow(s),veh/h/ln	1740	0	1549				0	1736	1547	1774	1770	0
Q Serve(g_s), s	13.5	0.0	16.4				0.0	21.1	0.4	11.6	0.0	0.0
Cycle Q Clear(g_c), s	13.5	0.0	16.4				0.0	21.1	0.4	11.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	927	0	413				0	998	445	525	2243	0
V/C Ratio(X)	0.70	0.00	0.82				0.00	0.94	0.02	0.70	0.19	0.00
Avail Cap(c_a), veh/h	1218	0	542				0	998	445	525	2243	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	0.84	0.84	0.00
Uniform Delay (d), s/veh	26.5	0.0	27.6				0.0	27.8	20.4	13.8	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	7.6				0.0	17.1	0.1	3.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	7.8				0.0	12.4	0.2	6.0	0.0	0.0
LnGrp Delay(d),s/veh	27.7	0.0	35.1				0.0	44.9	20.5	17.3	0.2	0.0
LnGrp LOS	C		D					D	C	B	A	
Approach Vol, veh/h		990						947			800	
Approach Delay, s/veh		30.3						44.7			8.0	
Approach LOS		C						D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	27.7	27.0		25.3		54.7						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	23.0	23.0		28.0		44.0						
Max Q Clear Time (g_c+1), s	23.1	23.1		18.4		2.0						
Green Ext Time (p_c), s	1.4	0.0		2.7		4.5						
Intersection Summary												
HCM 2010 Ctrl Delay			28.7									
HCM 2010 LOS			C									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	10	900	1370	30
Future Vol, veh/h	0	20	10	900	1370	30
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	12	12	8	8
Mvmt Flow	0	21	11	947	1442	32

Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	1957	741	1476	0
Stage 1	1460	-	-	-
Stage 2	497	-	-	-
Critical Hdwy	6.84	6.94	4.34	-
Critical Hdwy Stg 1	5.84	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-
Follow-up Hdwy	3.52	3.32	2.32	-
Pot Cap-1 Maneuver	56	359	406	-
Stage 1	180	-	-	-
Stage 2	577	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	54	358	405	-
Mov Cap-2 Maneuver	141	-	-	-
Stage 1	180	-	-	-
Stage 2	560	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	405	-	358	-	-
HCM Lane V/C Ratio	0.026	-	0.059	-	-
HCM Control Delay (s)	14.1	-	15.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	
Traffic Vol, veh/h	1380	10	10	910	0	20
Future Vol, veh/h	1380	10	10	910	0	20
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1453	11	11	958	0	21



















Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	1465	1962
Stage 1	-	-	1460
Stage 2	-	-	502
Critical Hdwy	-	4.14	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	-	2.22	3.52
Pot Cap-1 Maneuver	-	457	55
Stage 1	-	-	180
Stage 2	-	-	573
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	456	52
Mov Cap-2 Maneuver	-	-	140
Stage 1	-	-	180
Stage 2	-	-	542

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	15.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	360	-	-	456	-
HCM Lane V/C Ratio	0.058	-	-	0.023	-
HCM Control Delay (s)	15.6	-	-	13.1	0.3
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-























HCM 2010 Signalized Intersection Summary
9: Cambridge Road & Country Club Drive

Cumulative Plus Project Conditions (Mitigated)
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	40	20	30	70	10	20	480	70	10	520	140
Future Volume (veh/h)	230	40	20	30	70	10	20	480	70	10	520	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	267	47	23	37	86	12	21	505	74	11	591	159
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.95	0.95	0.95	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	299	53	26	49	113	16	33	745	109	19	652	175
Arrive On Green	0.21	0.21	0.21	0.10	0.10	0.10	0.02	0.47	0.47	0.01	0.46	0.46
Sat Flow, veh/h	1403	247	121	495	1152	161	1774	1588	233	1774	1414	380
Grp Volume(v), veh/h	337	0	0	135	0	0	21	0	579	11	0	750
Grp Sat Flow(s),veh/h/ln	1771	0	0	1808	0	0	1774	0	1821	1774	0	1795
Q Serve(g_s), s	14.1	0.0	0.0	5.6	0.0	0.0	0.9	0.0	18.9	0.5	0.0	29.6
Cycle Q Clear(g_c), s	14.1	0.0	0.0	5.6	0.0	0.0	0.9	0.0	18.9	0.5	0.0	29.6
Prop In Lane	0.79		0.07	0.27		0.09	1.00		0.13	1.00		0.21
Lane Grp Cap(c), veh/h	378	0	0	177	0	0	33	0	854	19	0	827
V/C Ratio(X)	0.89	0.00	0.00	0.76	0.00	0.00	0.63	0.00	0.68	0.57	0.00	0.91
Avail Cap(c_a), veh/h	393	0	0	378	0	0	93	0	881	93	0	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	0.0	33.6	0.0	0.0	37.3	0.0	15.8	37.7	0.0	19.1
Incr Delay (d2), s/veh	21.3	0.0	0.0	6.6	0.0	0.0	17.8	0.0	2.0	23.7	0.0	12.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	0.0	0.0	3.1	0.0	0.0	0.6	0.0	10.0	0.4	0.0	17.5
LnGrp Delay(d),s/veh	50.6	0.0	0.0	40.3	0.0	0.0	55.1	0.0	17.9	61.3	0.0	31.9
LnGrp LOS	D			D			E		B	E		C
Approach Vol, veh/h		337			135			600				761
Approach Delay, s/veh		50.6			40.3			19.2				32.3
Approach LOS		D			D			B				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	39.9		20.3	5.4	39.3		11.5				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	37.0		17.0	4.0	37.0		16.0				
Max Q Clear Time (g_c+I1), s	2.5	20.9		16.1	2.9	31.6		7.6				
Green Ext Time (p_c), s	0.0	8.3		0.2	0.0	3.7		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				31.9								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary
10: Cambridge Road & Knollwood Drive

Cumulative Plus Project Conditions (Mitigated)
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	60	330	370	90	90	480	500	340	70	550	10
Future Volume (veh/h)	10	60	330	370	90	90	480	500	340	70	550	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	11	65	359	493	120	120	533	556	378	77	604	11
Adj No. of Lanes	0	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.90	0.90	0.90	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	211	672	473	228	228	517	767	650	98	622	11
Arrive On Green	0.13	0.13	0.13	0.27	0.27	0.27	0.49	0.69	0.69	0.06	0.17	0.17
Sat Flow, veh/h	268	1582	1576	1774	855	855	1774	1863	1579	1774	3556	65
Grp Volume(v), veh/h	76	0	359	493	0	240	533	556	378	77	300	315
Grp Sat Flow(s),veh/h/ln	1849	0	1576	1774	0	1710	1774	1863	1579	1774	1770	1851
Q Serve(g_s), s	4.5	0.0	16.0	32.0	0.0	14.4	35.0	22.3	15.0	5.1	20.2	20.3
Cycle Q Clear(g_c), s	4.5	0.0	16.0	32.0	0.0	14.4	35.0	22.3	15.0	5.1	20.2	20.3
Prop In Lane	0.14		1.00	1.00		0.50	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	247	0	672	473	0	456	517	767	650	98	310	324
V/C Ratio(X)	0.31	0.00	0.53	1.04	0.00	0.53	1.03	0.73	0.58	0.79	0.97	0.97
Avail Cap(c_a), veh/h	247	0	672	473	0	456	517	767	650	118	310	324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.42	0.42	0.42	0.33	0.33	0.33
Uniform Delay (d), s/veh	47.0	0.0	25.7	44.0	0.0	37.5	30.8	14.5	13.4	56.0	49.2	49.2
Incr Delay (d2), s/veh	0.7	0.0	0.8	52.8	0.0	1.1	33.6	2.5	1.6	9.4	23.0	22.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	9.0	22.6	0.0	6.9	21.8	11.8	6.7	2.8	11.9	12.4
LnGrp Delay(d),s/veh	47.7	0.0	26.5	96.8	0.0	38.7	64.4	17.1	15.0	65.4	72.2	71.8
LnGrp LOS	D		C	F		D	F	B	B	E	E	E
Approach Vol, veh/h		435			733			1467			692	
Approach Delay, s/veh		30.2			77.7			33.7			71.2	
Approach LOS		C			E			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.6	53.4		20.0	39.0	25.0		36.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	8.0	48.0		16.0	35.0	21.0		32.0				
Max Q Clear Time (g_c+I1), s	7.1	24.3		18.0	37.0	22.3		34.0				
Green Ext Time (p_c), s	0.0	10.0		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			50.8									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary Cumulative Plus Project Conditions (Mitigated)
 11: Cambridge Road & Merrychase Drive/US 50 WB Ramps PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖↗	↖	↗	↖	↗	↖	↗	↖↗	
Traffic Volume (veh/h)	70	80	180	600	210	530	160	840	50	430	870	70
Future Volume (veh/h)	70	80	180	600	210	530	160	840	50	430	870	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	80	91	0	674	471	392	176	923	0	478	967	74
Adj No. of Lanes	0	1	1	2	1	1	1	2	1	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	83	94	154	857	450	803	238	923	413	472	1308	100
Arrive On Green	0.10	0.10	0.00	0.24	0.24	0.24	0.09	0.17	0.00	0.53	0.79	0.79
Sat Flow, veh/h	852	969	1583	3548	1863	1579	1774	3539	1583	1774	3332	255
Grp Volume(v), veh/h	171	0	0	674	471	392	176	923	0	478	514	527
Grp Sat Flow(s),veh/h/ln	1820	0	1583	1774	1863	1579	1774	1770	1583	1774	1770	1817
Q Serve(g_s), s	11.2	0.0	0.0	21.3	29.0	0.0	11.6	31.3	0.0	31.9	17.8	17.9
Cycle Q Clear(g_c), s	11.2	0.0	0.0	21.3	29.0	0.0	11.6	31.3	0.0	31.9	17.8	17.9
Prop In Lane	0.47		1.00	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	177	0	154	857	450	803	238	923	413	472	695	713
V/C Ratio(X)	0.96	0.00	0.00	0.79	1.05	0.49	0.74	1.00	0.00	1.01	0.74	0.74
Avail Cap(c_a), veh/h	177	0	154	857	450	803	238	923	413	472	695	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.63	0.63	0.00	0.41	0.41	0.41
Uniform Delay (d), s/veh	53.9	0.0	0.0	42.6	45.5	19.3	52.6	49.5	0.0	28.1	9.8	9.8
Incr Delay (d2), s/veh	56.4	0.0	0.0	4.5	55.0	0.2	6.7	23.5	0.0	30.0	2.9	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.0	0.0	11.0	21.8	8.5	6.1	18.3	0.0	19.1	8.8	9.1
LnGrp Delay(d),s/veh	110.3	0.0	0.0	47.1	100.5	19.5	59.2	73.0	0.0	58.1	12.7	12.6
LnGrp LOS	F			D	F	B	E	E		F	B	B
Approach Vol, veh/h		171			1537			1099			1519	
Approach Delay, s/veh		110.3			56.4			70.8			27.0	
Approach LOS		F			E			E			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	35.4	35.7		15.8	19.6	51.5		33.1				
Change Period (Y+Rc), s	3.5	4.4		4.1	3.5	4.4		4.1				
Max Green Setting (Gmax), s	31.9	31.3		11.7	16.1	47.1		29.0				
Max Q Clear Time (g_c+3.5), s	33.3	33.3		13.2	13.6	19.9		31.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.2	3.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			51.9									
HCM 2010 LOS			D									
Notes												

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary Cumulative Plus Project Conditions (Mitigated)
 13: Flying C Road & Crazy Horse Road & Cambridge Road PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕↔		↕	↑	↗
Traffic Volume (veh/h)	70	10	10	20	10	150	10	640	20	190	760	110
Future Volume (veh/h)	70	10	10	20	10	150	10	640	20	190	760	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	89	13	13	28	14	211	11	674	21	200	800	116
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	1	1
Peak Hour Factor	0.79	0.79	0.79	0.71	0.71	0.71	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	16	16	24	12	179	149	1832	57	226	1056	896
Arrive On Green	0.08	0.08	0.08	0.13	0.13	0.13	0.08	0.52	0.52	0.26	1.00	1.00
Sat Flow, veh/h	1360	199	199	178	89	1343	1774	3504	109	1774	1863	1581
Grp Volume(v), veh/h	115	0	0	253	0	0	11	340	355	200	800	116
Grp Sat Flow(s),veh/h/ln	1757	0	0	1610	0	0	1774	1770	1843	1774	1863	1581
Q Serve(g_s), s	7.7	0.0	0.0	16.0	0.0	0.0	0.7	13.6	13.6	13.0	0.0	0.0
Cycle Q Clear(g_c), s	7.7	0.0	0.0	16.0	0.0	0.0	0.7	13.6	13.6	13.0	0.0	0.0
Prop In Lane	0.77		0.11	0.11		0.83	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	145	0	0	215	0	0	149	925	964	226	1056	896
V/C Ratio(X)	0.79	0.00	0.00	1.18	0.00	0.00	0.07	0.37	0.37	0.88	0.76	0.13
Avail Cap(c_a), veh/h	234	0	0	215	0	0	149	925	964	340	1056	896
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	54.0	0.0	0.0	52.0	0.0	0.0	50.7	16.9	16.9	43.8	0.0	0.0
Incr Delay (d2), s/veh	9.2	0.0	0.0	118.1	0.0	0.0	0.2	1.1	1.1	9.5	2.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	0.0	14.1	0.0	0.0	0.3	6.9	7.2	6.9	0.8	0.0
LnGrp Delay(d),s/veh	63.2	0.0	0.0	170.1	0.0	0.0	50.9	18.0	18.0	53.3	2.7	0.2
LnGrp LOS	E			F			D	B	B	D	A	A
Approach Vol, veh/h		115			253			706			1116	
Approach Delay, s/veh		63.2			170.1			18.5			11.5	
Approach LOS		E			F			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	66.7		13.9	14.1	72.0		20.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	49.0	49.0		16.0	4.0	68.0		16.0				
Max Q Clear Time (g_c+1), s	15.6	15.6		9.7	2.7	2.0		18.0				
Green Ext Time (p_c), s	0.3	4.9		0.2	0.0	8.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				34.8								
HCM 2010 LOS				C								

Cumulative Plus Project Roadway Segments Analysis		Note: County Website Counts are the average of the T		Peak Hour Volume		LOS Thresholds			V/ C Ratio		LOS	
Marble Valley EIR		Count Source	Number of Lanes	AM	PM	LOS C	LOS D	LOS E	AM	PM	AM	PM
Bass Lake Rd - Green Valley Rd to US 50 (2 segments) - 4 extra												
	Hollow Oak Dr to Country Club	Intersection Counts	4AU	1720	1540	1760	3070	3130	0.55	0.49	C or better	C or better
	Hollow Oak Dr to Country Club	Intersection Counts	4AD	1720	1540	1850	3220	3290	0.52	0.47	C or better	C or better

APPENDIX A:
Existing and Cumulative Signal Warrants

DRAFT

Major Street **Bass Lake Rd**
 Minor Street **Serrano Pkwy**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

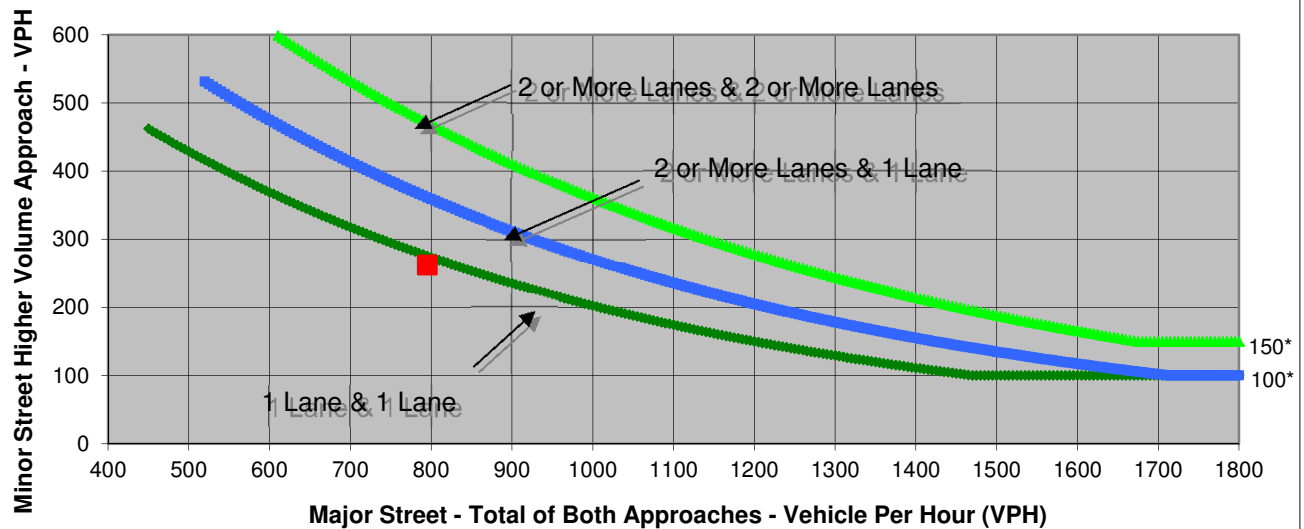
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	37	106	0
Through	0	0	100	504
Right	0	225	0	85
Total	0	262	206	589

Major Street Direction

	North/South
x	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Serrano Pkwy	Warrant Met
Number of Approach Lanes	1	1	
Traffic Volume (VPH) *	795	262	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Bass Lake Rd
 Minor Street Hollow Oak Dr

Project Marble Valley EIR
 Scenario Existing Conditions
 Peak Hour AM

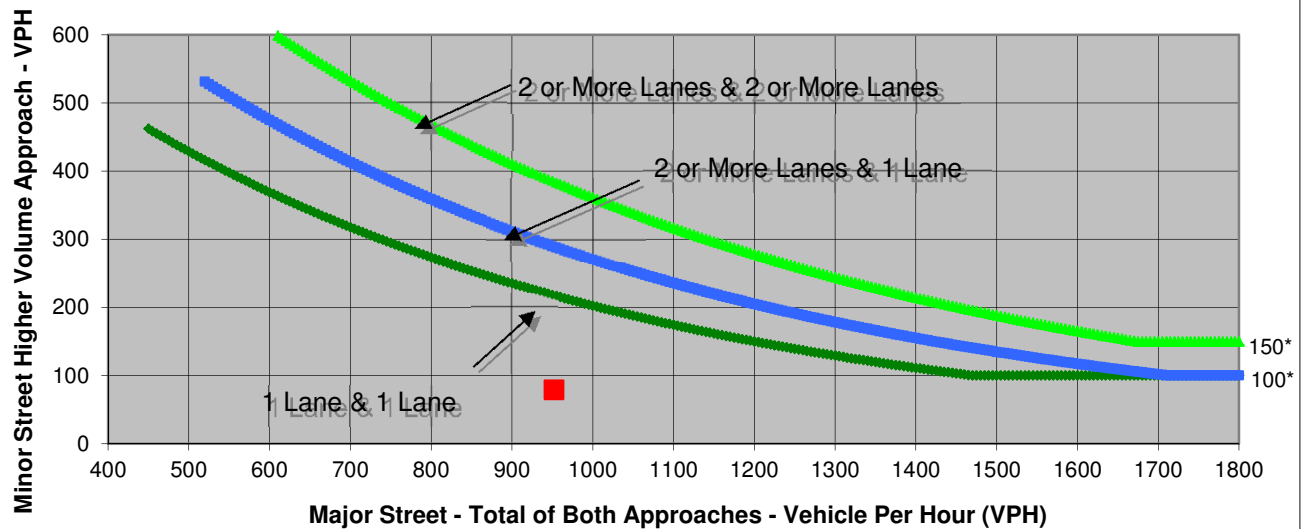
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	8	0	67
Through	200	713	0	0
Right	31	0	0	12
Total	231	721	0	79

Major Street Direction

<u>x</u>	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Hollow Oak Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	952	79	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

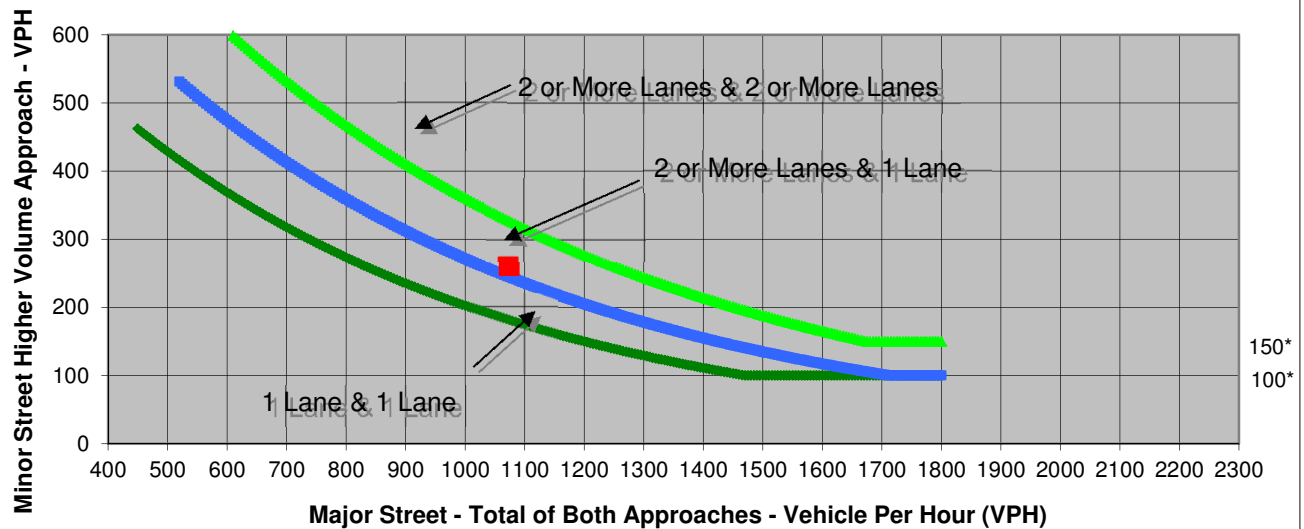
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	133	0	187
Through	159	658	0	0
Right	124	0	0	74
Total	283	791	0	261

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,074	261	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

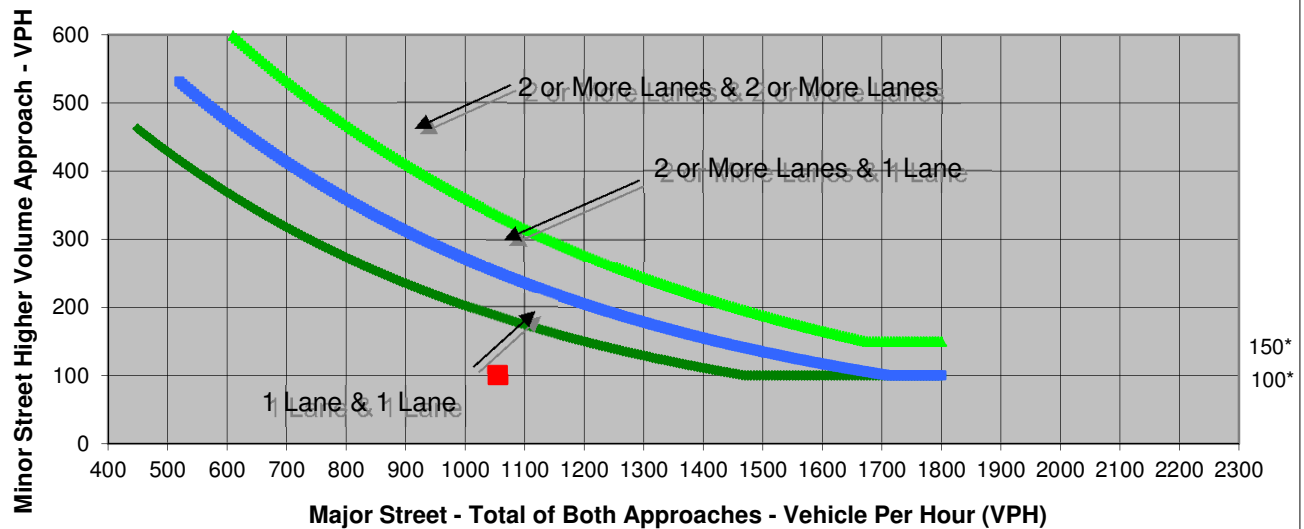
Major Street **Bass Lake Rd**
 Minor Street **US 50 WB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

Turn Movement Volumes				
	NB	SB	EB	WB
Left	21	0	0	7
Through	189	133	0	0
Right	0	712	0	94
Total	210	845	0	101

Major Street Direction
x North/South
 East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street US 50 WB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,055	101	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

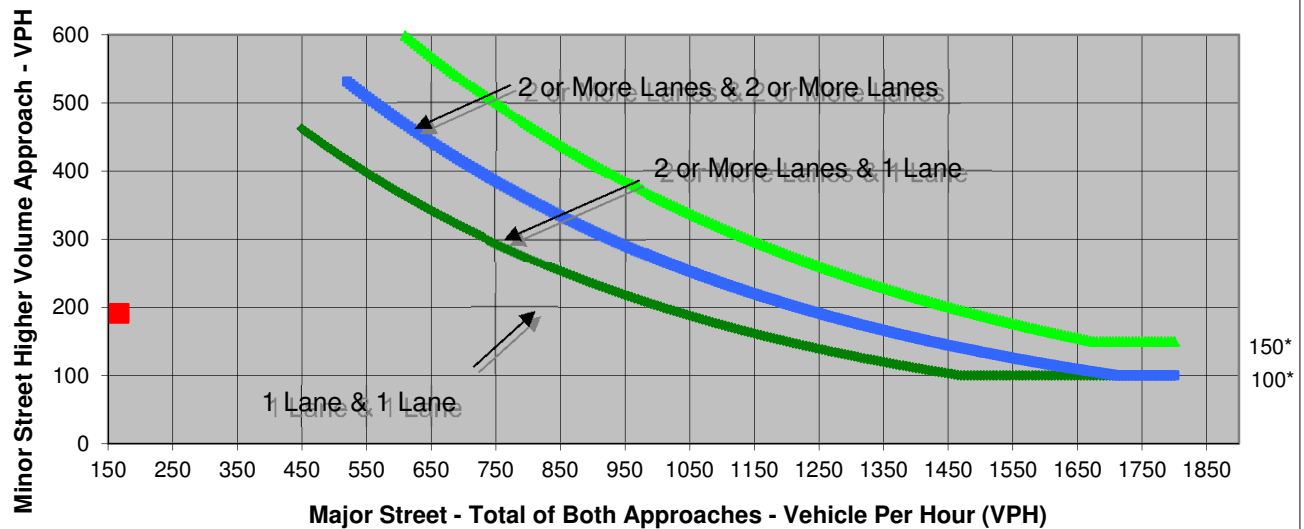
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	132	186	0
Through	24	8	0	0
Right	3	0	5	0
Total	27	140	191	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	US 50 EB Ramps	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	167	191	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

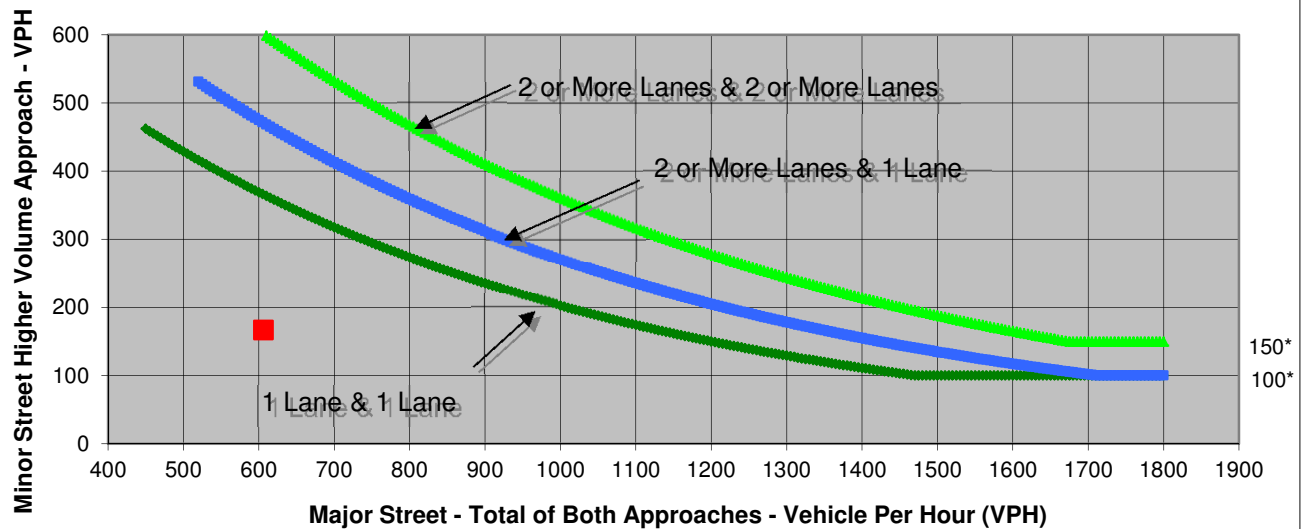
Turn Movement Volumes

	NB	SB	EB	WB
Left	12	15	69	88
Through	103	350	66	66
Right	35	91	29	13
Total	150	456	164	167

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	606	167	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Knollwood Dr**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

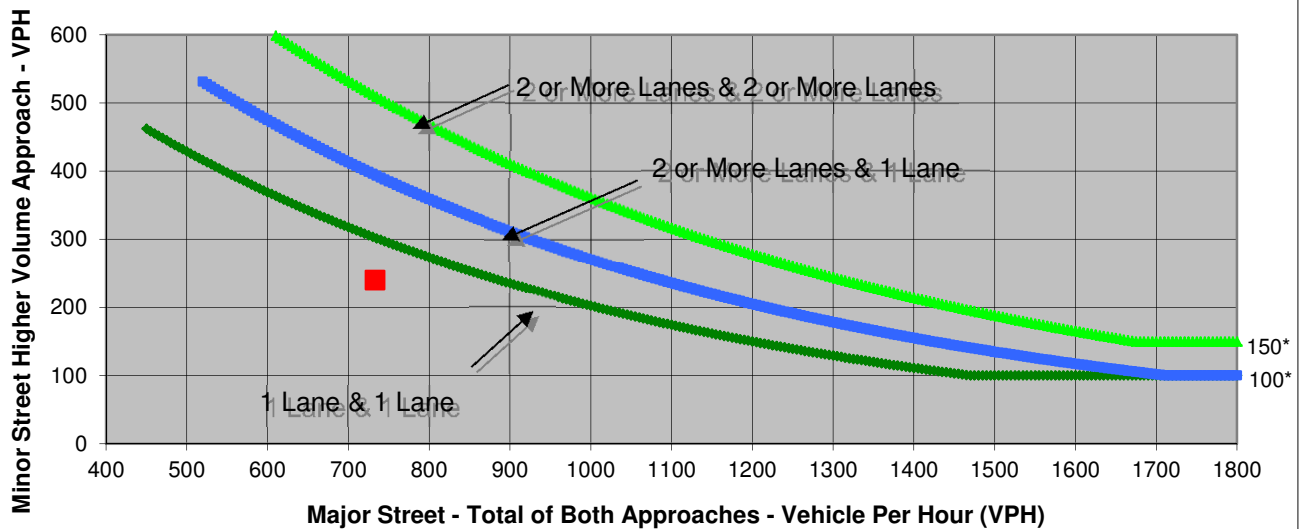
Turn Movement Volumes

	NB	SB	EB	WB
Left	119	1	5	0
Through	145	459	0	0
Right	2	7	235	2
Total	266	467	240	2

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Knollwood Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	733	240	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **AM**

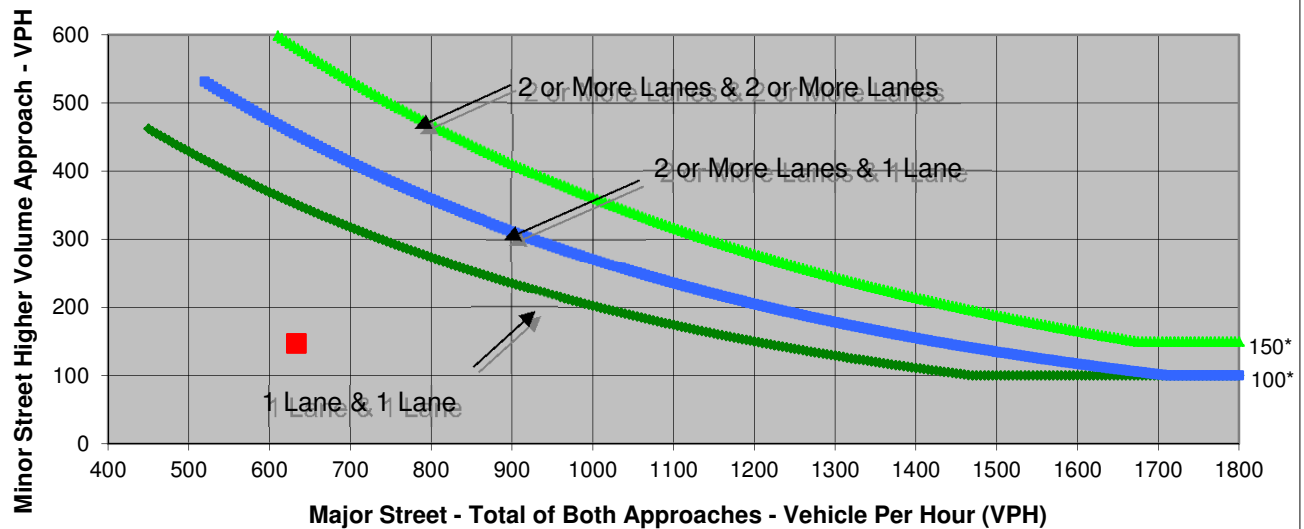
Turn Movement Volumes

	NB	SB	EB	WB
Left	15	0	131	0
Through	129	81	0	0
Right	0	408	16	0
Total	144	489	147	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street US 50 EB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	633	147	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Bass Lake Rd
 Minor Street Serrano Pkwy

Project Marble Valley EIR
 Scenario Existing Conditions
 Peak Hour PM

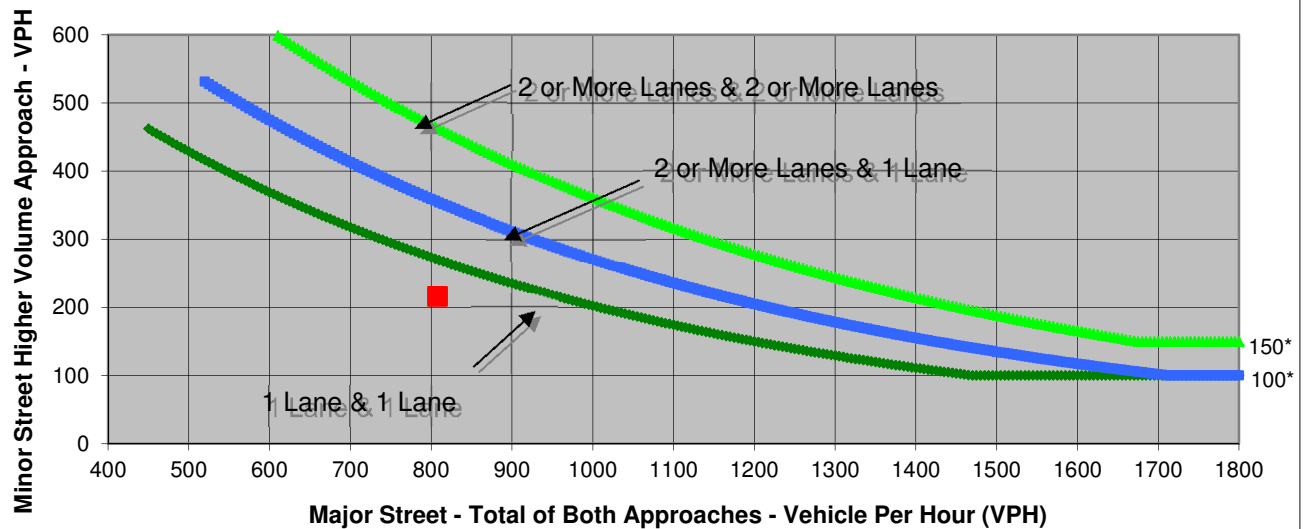
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	111	147	0
Through	0	0	394	213
Right	0	105	0	54
Total	0	216	541	267

Major Street Direction

	North/South
x	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Serrano Pkwy	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	808	216	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Hollow Oak Rd**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

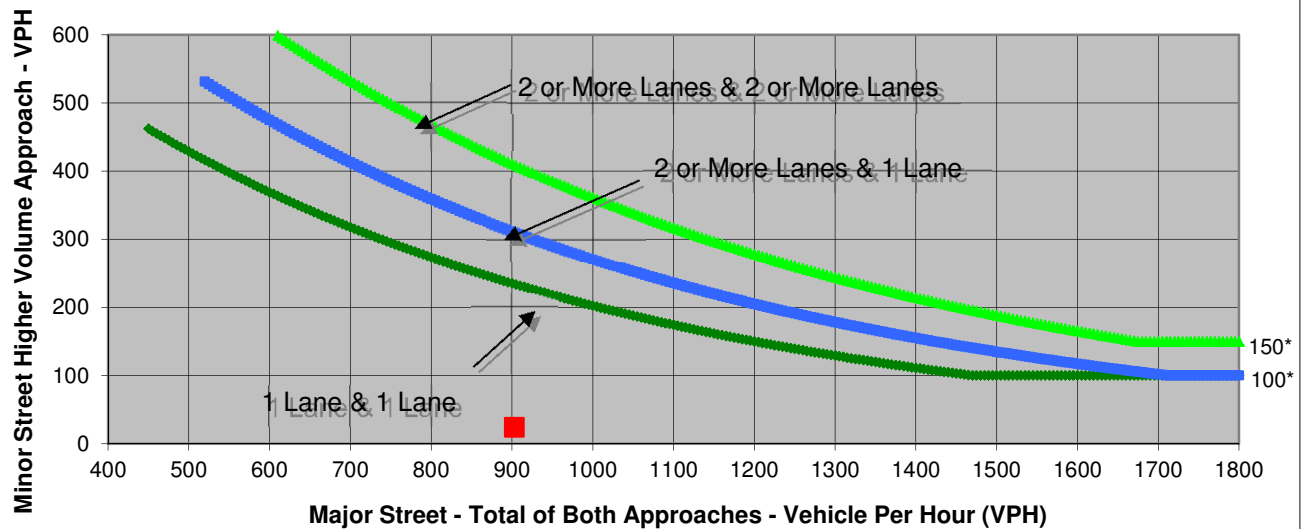
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	6	0	18
Through	549	308	0	0
Right	40	0	1	6
Total	589	314	1	24

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	Hollow Oak Rd	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	903	24	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

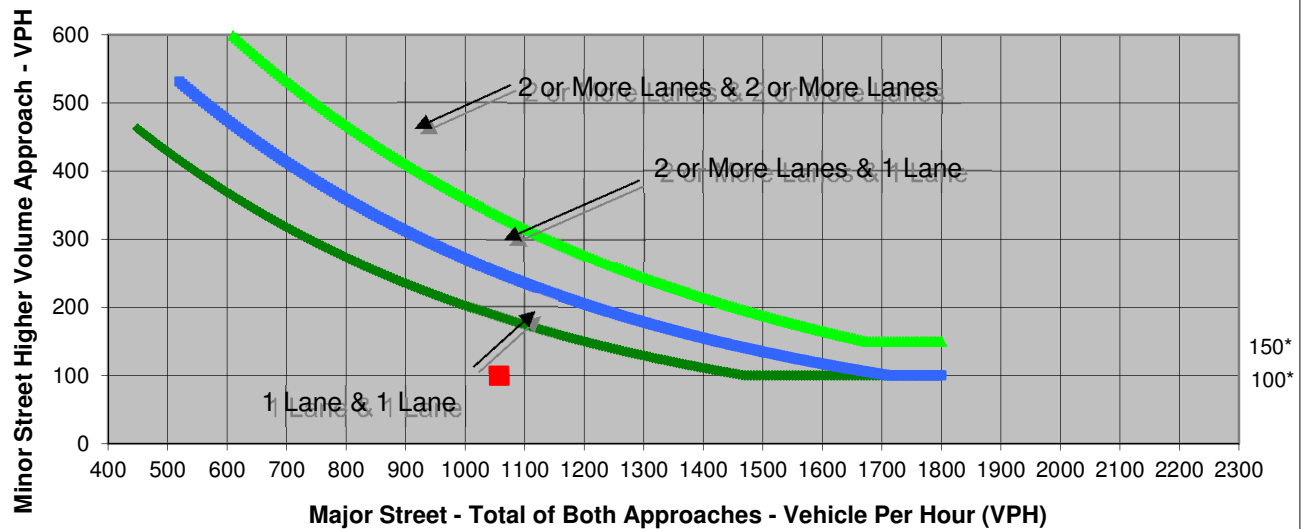
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	47	0	57
Through	559	288	0	0
Right	163	0	0	43
Total	722	335	0	100

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,057	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.			

Major Street **Bass Lake Rd**
 Minor Street **US 50 WB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

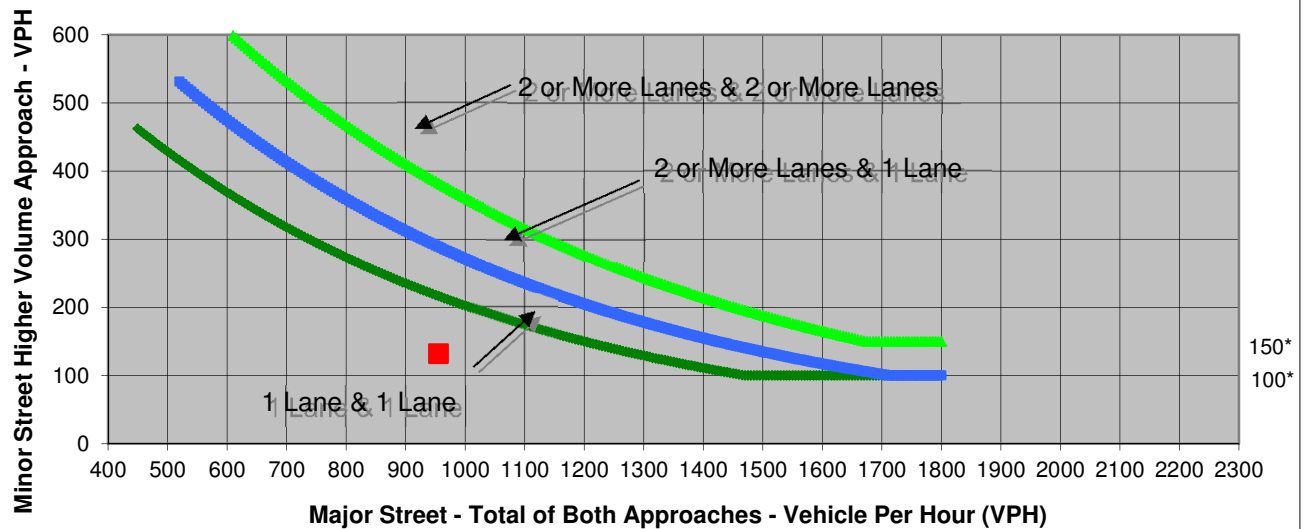
Turn Movement Volumes

	NB	SB	EB	WB
Left	12	0	0	1
Through	598	100	0	7
Right	0	245	0	124
Total	610	345	0	132

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street US 50 WB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	955	132	
* Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street **Bass Lake Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

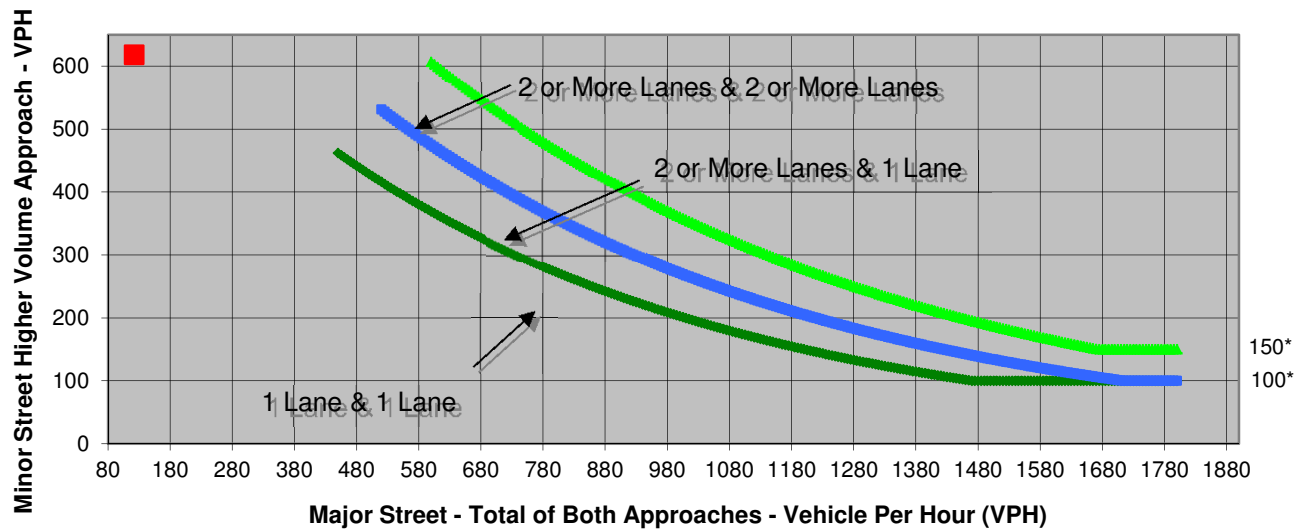
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	99	598	0
Through	12	8	2	0
Right	3	0	18	0
Total	15	107	618	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street US 50 EB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	122	618	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

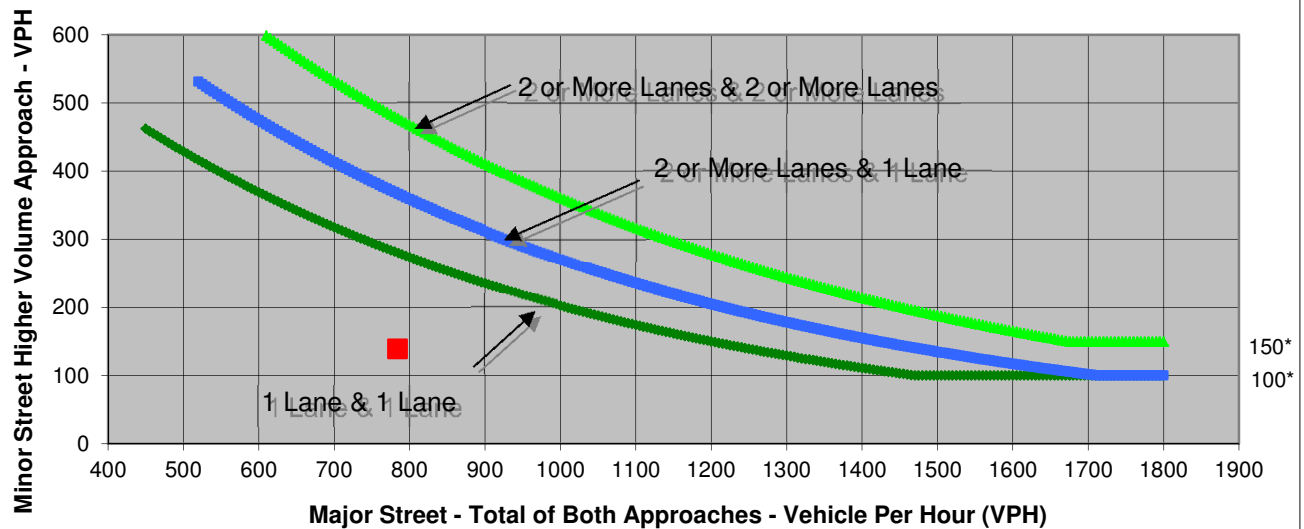
Turn Movement Volumes

	NB	SB	EB	WB
Left	17	24	61	37
Through	360	208	37	69
Right	97	78	19	33
Total	474	310	117	139

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	784	139	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Knollwood Dr**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

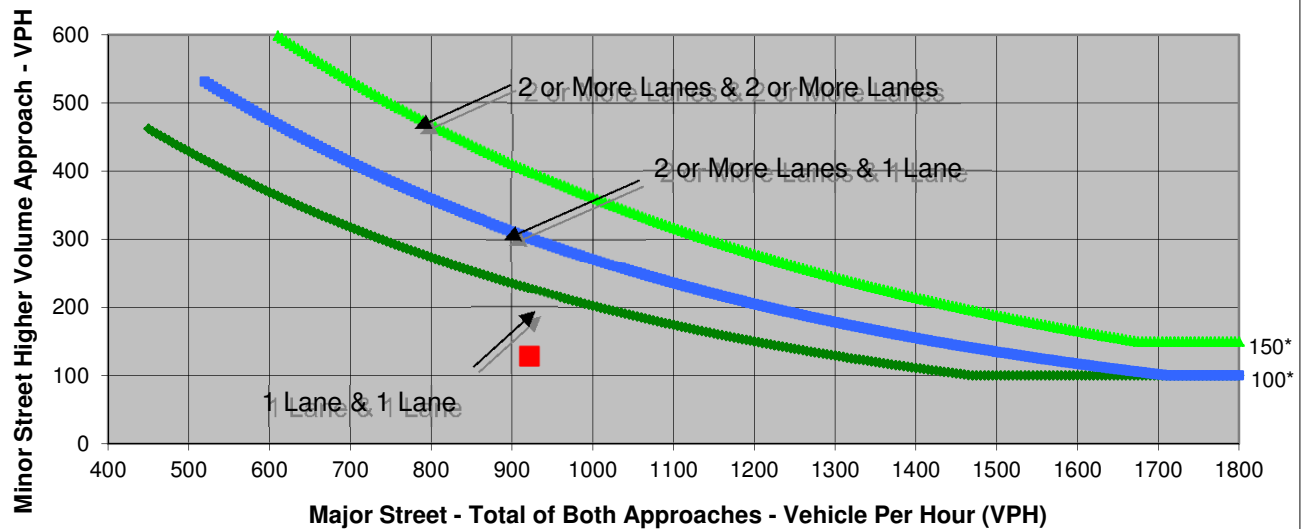
Turn Movement Volumes

	NB	SB	EB	WB
Left	193	2	7	4
Through	465	253	0	3
Right	0	9	122	2
Total	658	264	129	9

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Knollwood Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	922	129	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Conditions**
 Peak Hour **PM**

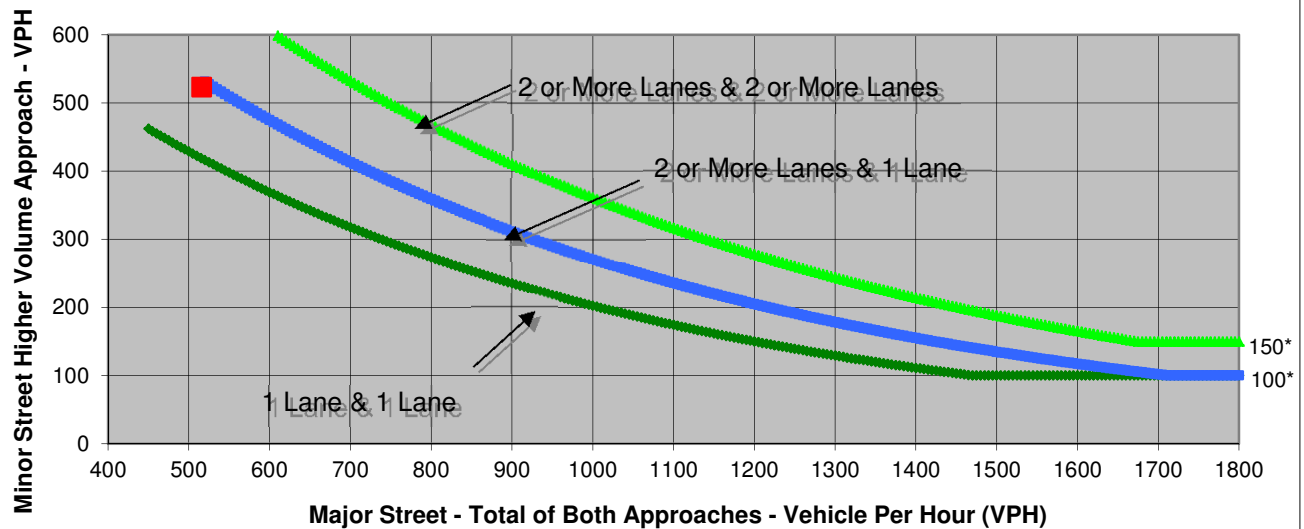
Turn Movement Volumes

	NB	SB	EB	WB
Left	35	0	445	0
Through	103	95	0	0
Right	0	283	78	0
Total	138	378	523	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street US 50 EB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	516	523	
* Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Bass Lake Rd
 Minor Street Serrano Pkwy

Project Marble Valley EIR
 Scenario Existing Plus Project
 Peak Hour AM

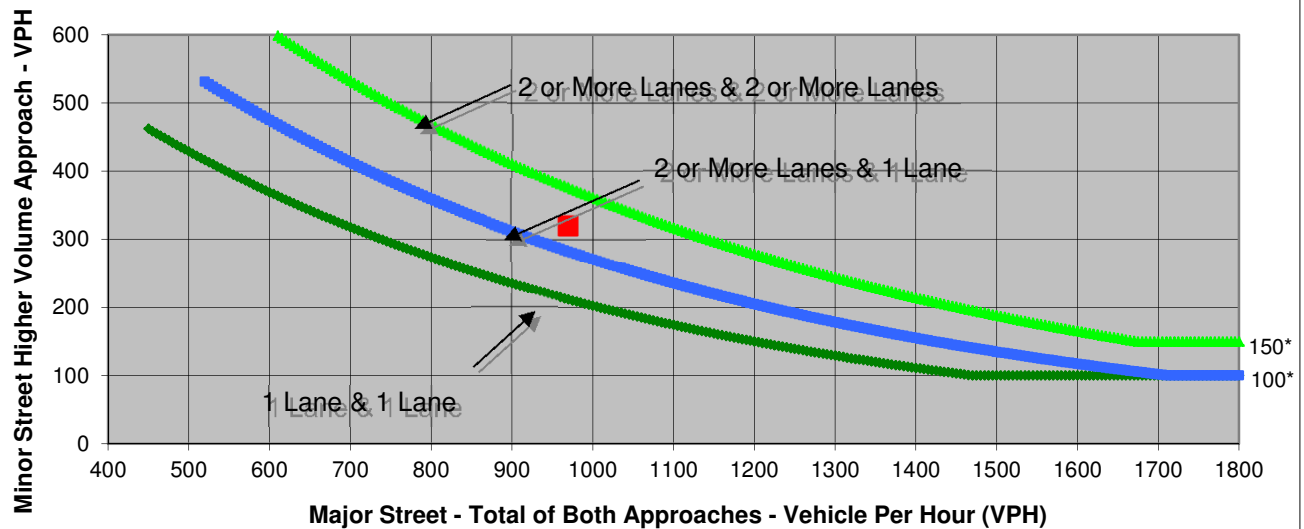
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	37	186	0
Through	0	0	136	563
Right	0	283	0	85
Total	0	320	322	648

Major Street Direction

	North/South
x	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Serrano Pkwy	Warrant Met
Number of Approach Lanes	1	1	YES
Traffic Volume (VPH) *	970	320	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Hollow Oak Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

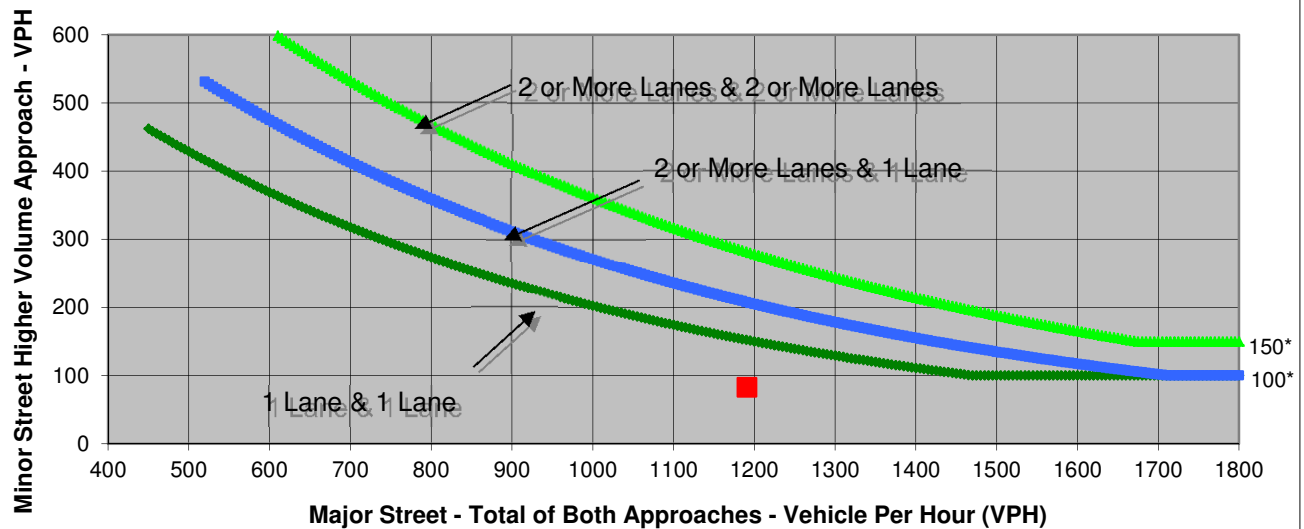
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	8	0	71
Through	317	832	0	0
Right	34	0	0	12
Total	351	840	0	83

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Hollow Oak Dr	Warrant Met
Number of Approach Lanes	1	1	
Traffic Volume (VPH) *	1,191	83	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

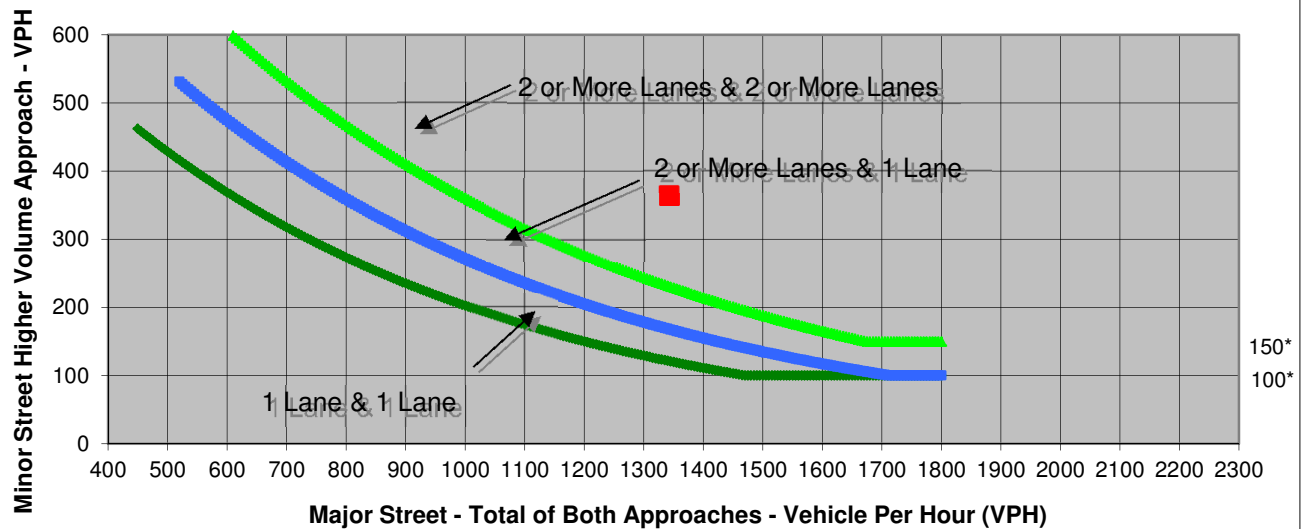
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	135	0	281
Through	269	780	0	0
Right	159	0	0	83
Total	428	915	0	364

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,343	364	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street **Bass Lake Rd**
 Minor Street **US 50 WB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

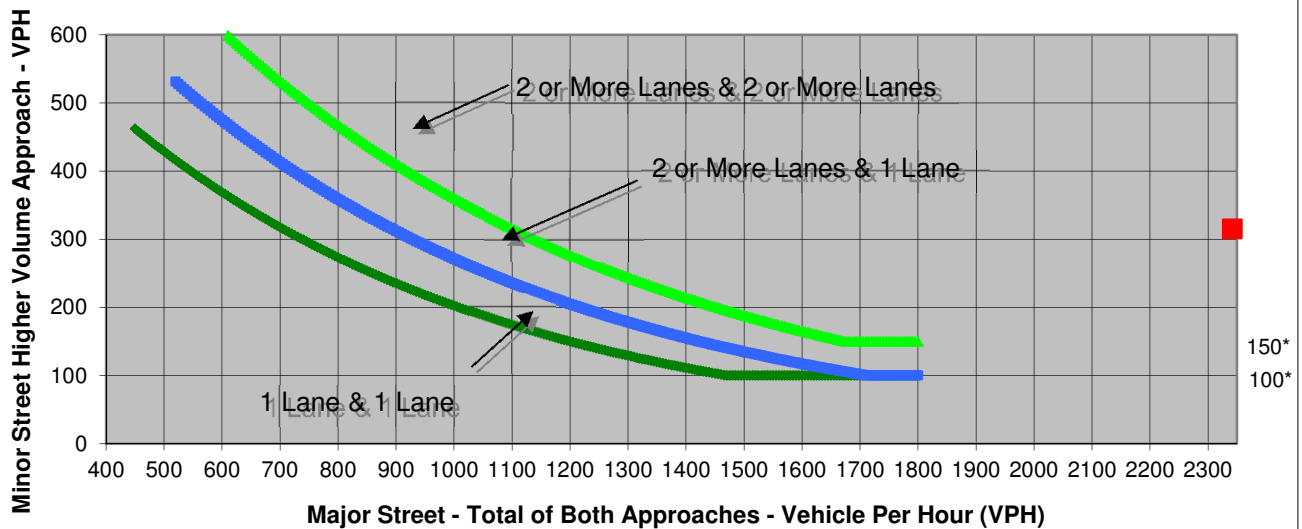
Turn Movement Volumes

	NB	SB	EB	WB
Left	950	0	0	218
Through	331	349	0	0
Right	0	712	0	97
Total	1,281	1,061	0	315

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street US 50 WB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	2,342	315	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street **Bass Lake Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

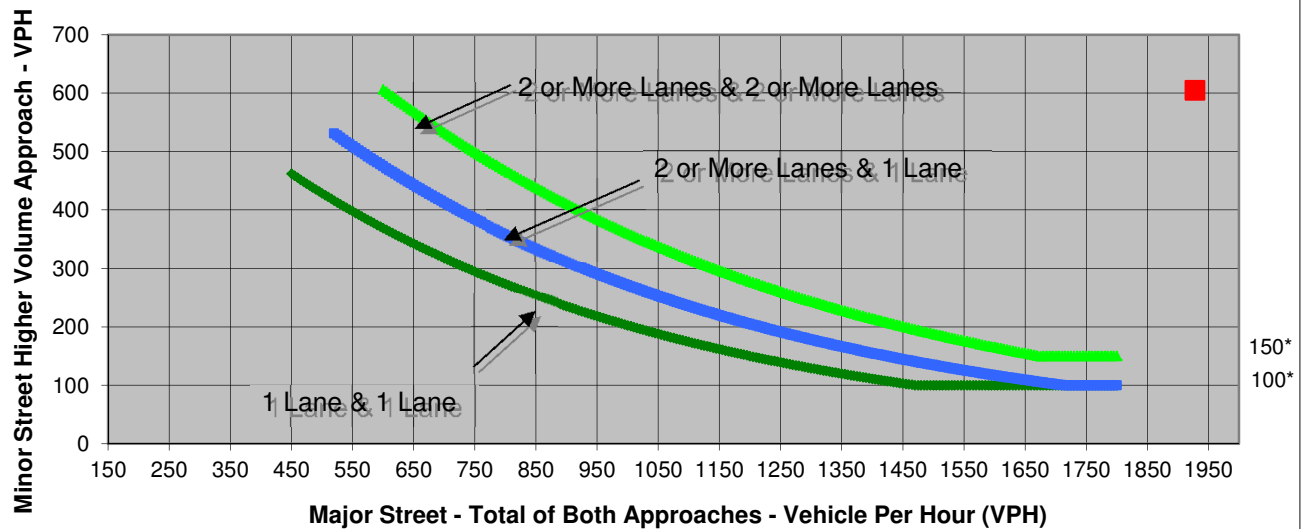
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	141	186	0
Through	1,095	426	0	0
Right	266	0	419	0
Total	1,361	567	605	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	US 50 EB Ramps	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,928	605	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

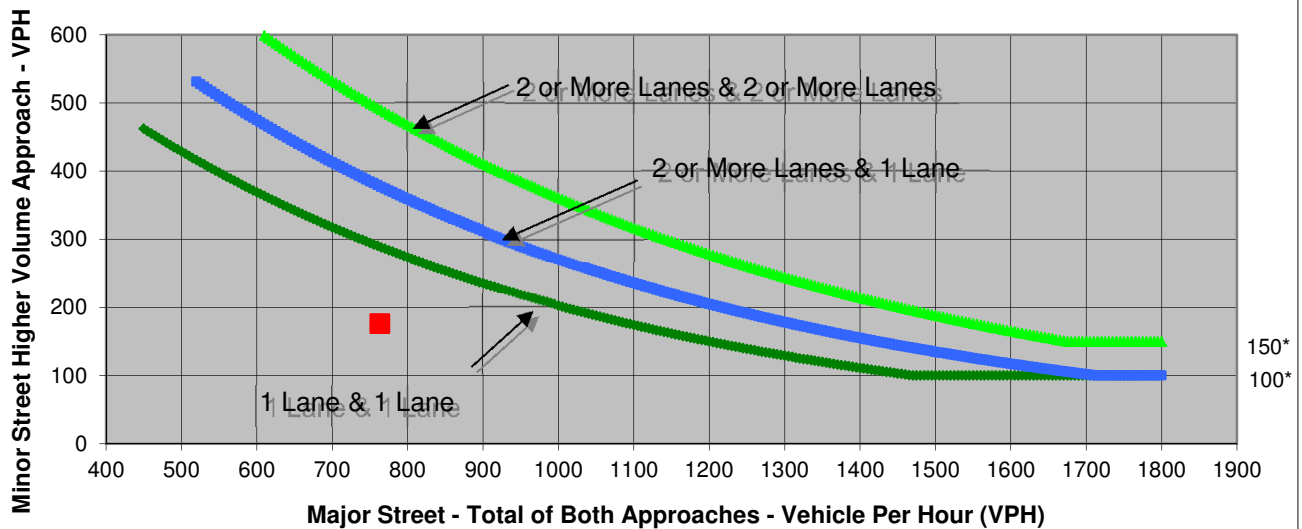
Turn Movement Volumes

	NB	SB	EB	WB
Left	12	15	73	91
Through	161	393	67	72
Right	43	139	29	13
Total	216	547	169	176

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	763	176	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Knollwood Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

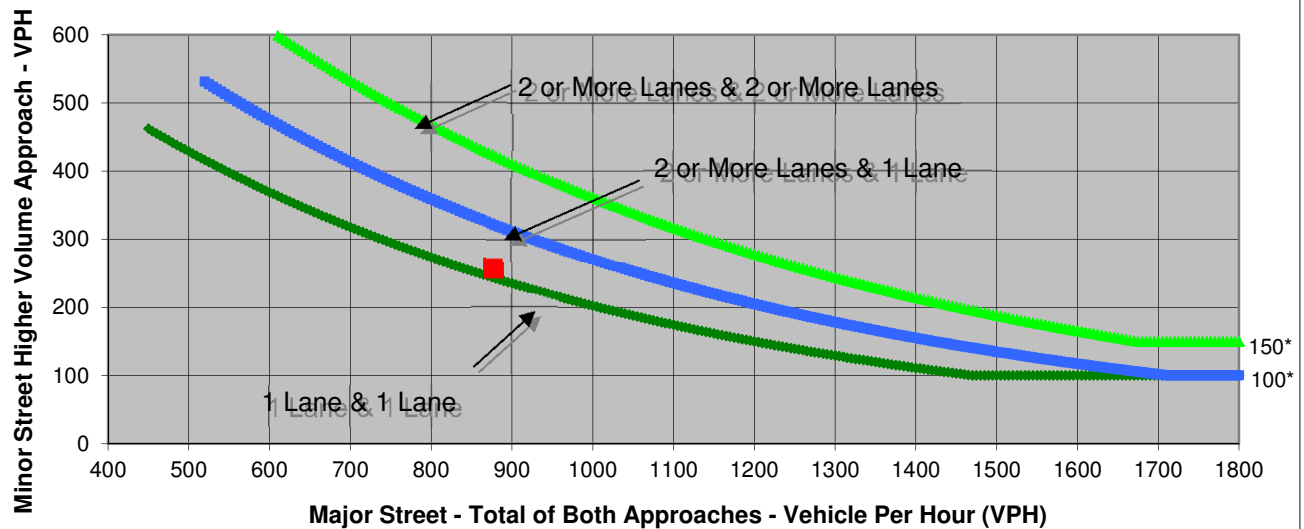
Turn Movement Volumes

	NB	SB	EB	WB
Left	148	1	5	0
Through	211	505	0	1
Right	5	7	253	3
Total	364	513	258	4

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Knollwood Dr	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	877	258	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **AM**

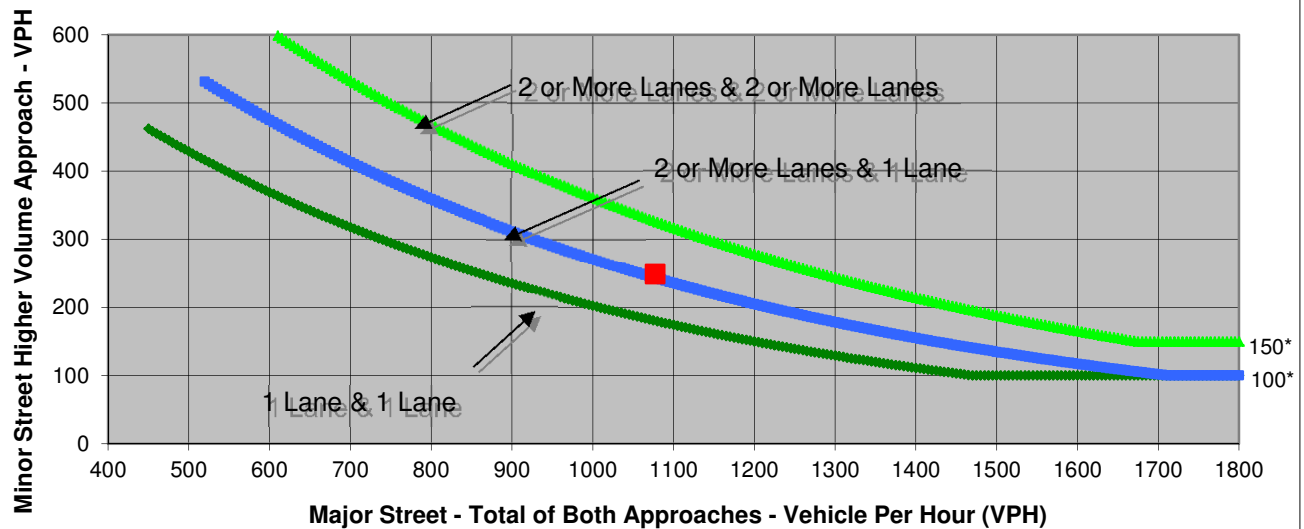
Turn Movement Volumes

	NB	SB	EB	WB
Left	106	0	161	0
Through	377	186	0	0
Right	0	408	88	0
Total	483	594	249	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street US 50 EB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,077	249	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Serrano Pkwy**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

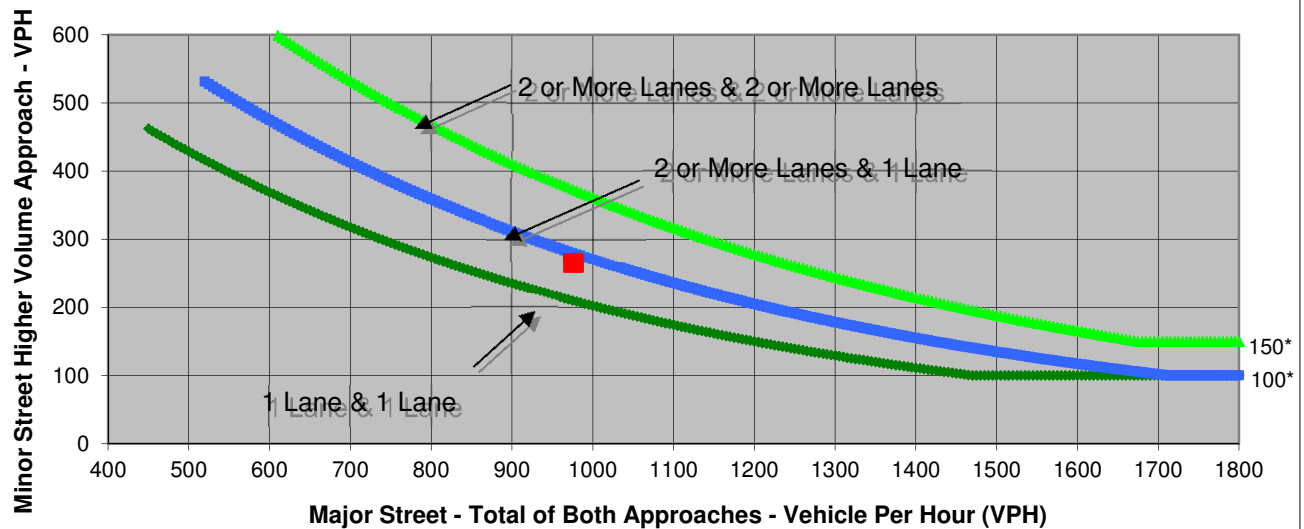
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	111	200	0
Through	0	0	459	263
Right	0	155	0	54
Total	0	266	659	317

Major Street Direction

	North/South
x	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Serrano Pkwy	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	976	266	
* Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Bass Lake Rd
 Minor Street Hollow Oak Dr

Project Marble Valley EIR
 Scenario Existing Plus Project
 Peak Hour PM

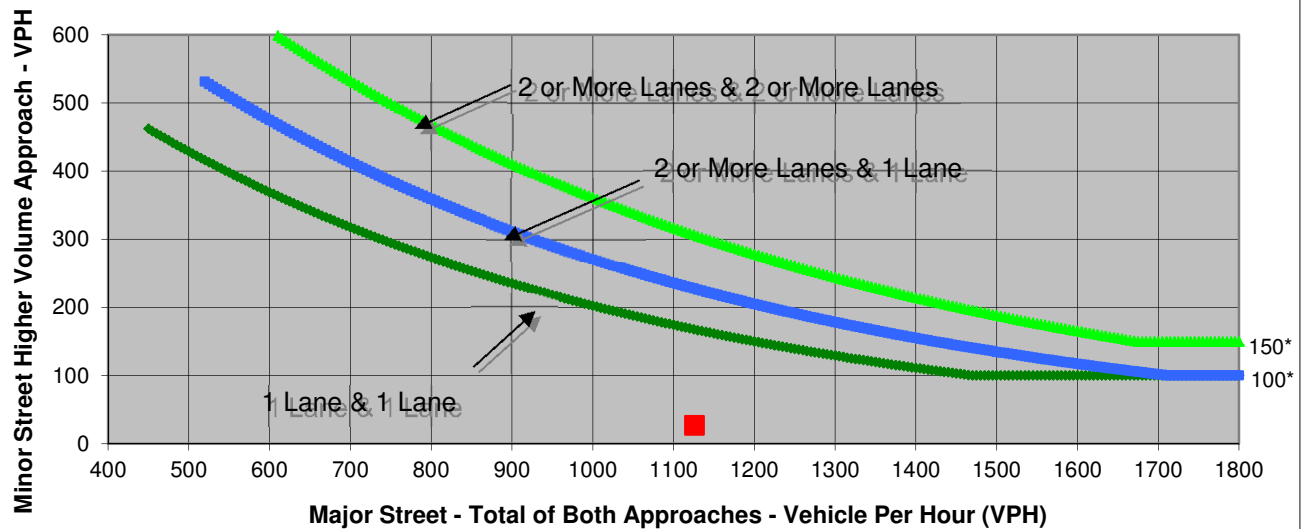
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	6	0	21
Through	668	0	0	0
Right	44	408	1	6
Total	712	414	1	27

Major Street Direction

<u>x</u>	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	Hollow Oak Dr	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,126	27	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

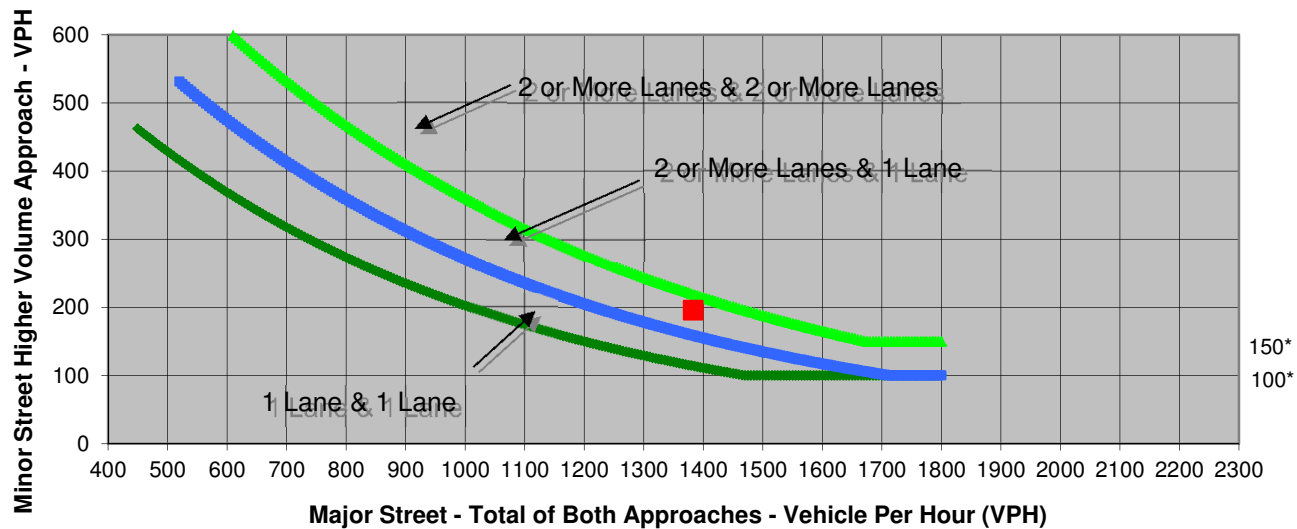
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	56	0	144
Through	674	383	0	0
Right	270	0	0	52
Total	944	439	0	196

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,383	196	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **US 50 WB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

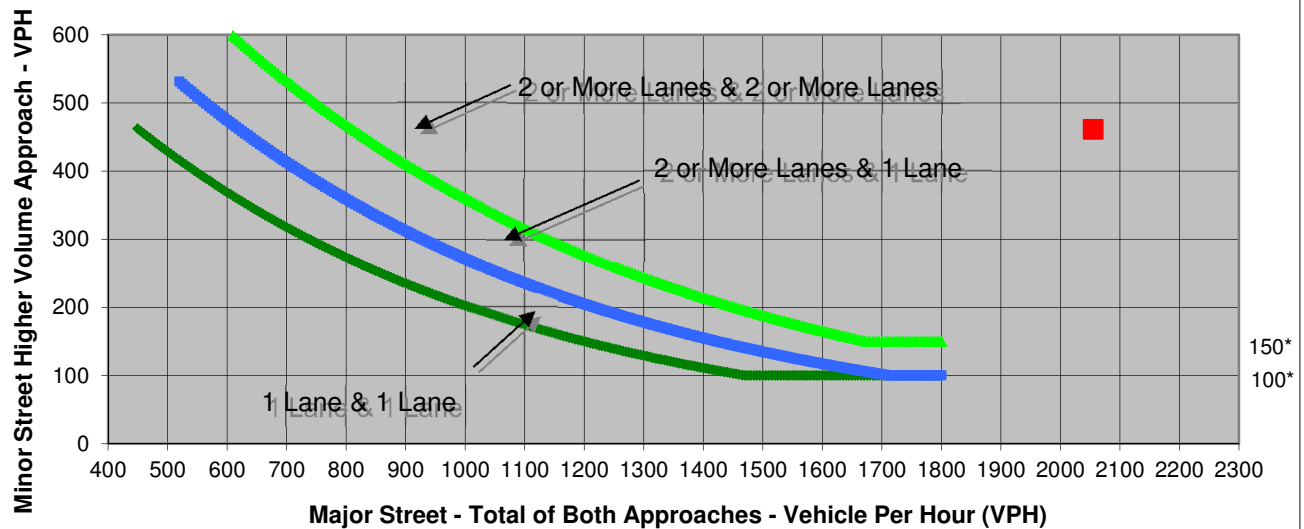
Turn Movement Volumes

	NB	SB	EB	WB
Left	708	0	0	336
Through	819	283	0	1
Right	0	245	0	124
Total	1,527	528	0	461

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Bass Lake Rd	Minor Street US 50 WB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	2,055	461	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Bass Lake Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

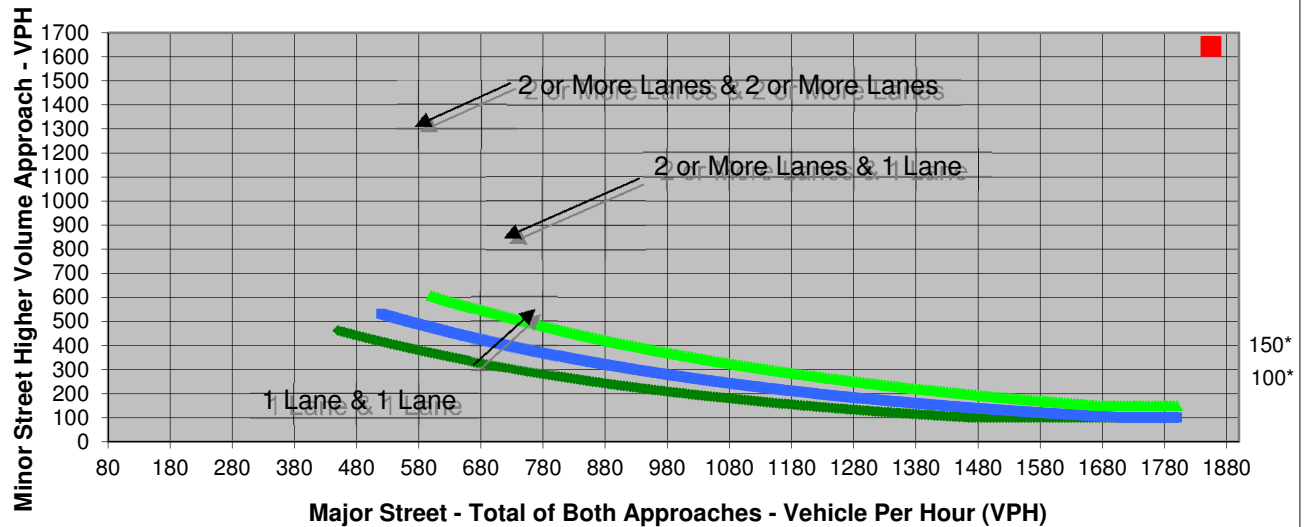
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	99	598	0
Through	929	520	2	0
Right	307	0	1,043	0
Total	1,236	619	1,643	0

Major Street Direction

x North/South
 East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	US 50 EB Ramps	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,855	1,643	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Country Club Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

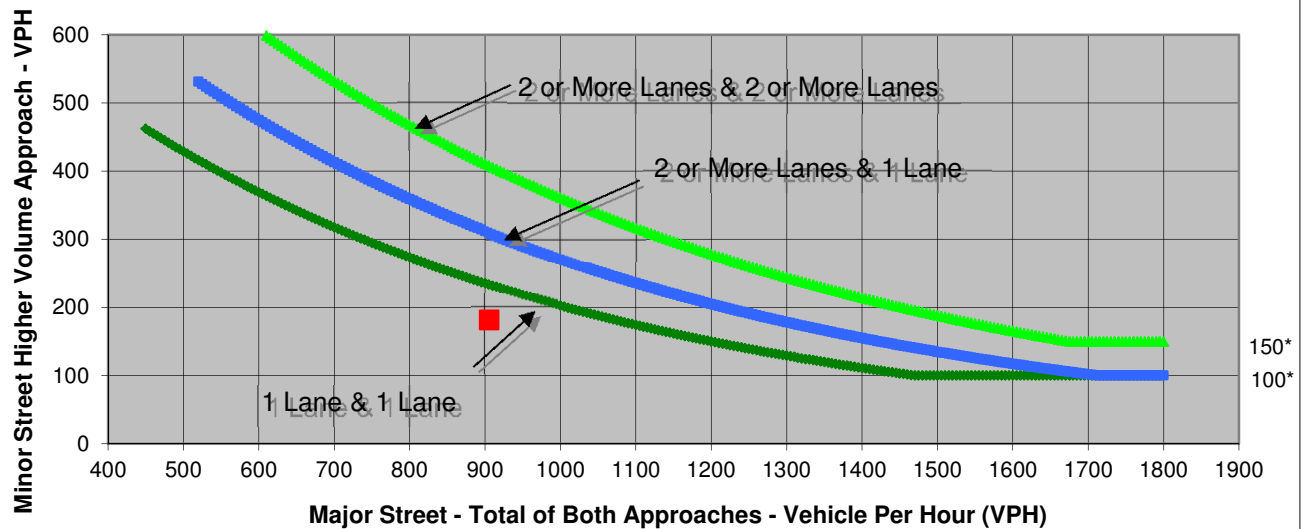
Turn Movement Volumes

	NB	SB	EB	WB
Left	17	24	114	33
Through	400	244	48	76
Right	102	119	19	41
Total	519	387	181	150

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Country Club Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	906	181	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **Knollwood Dr**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

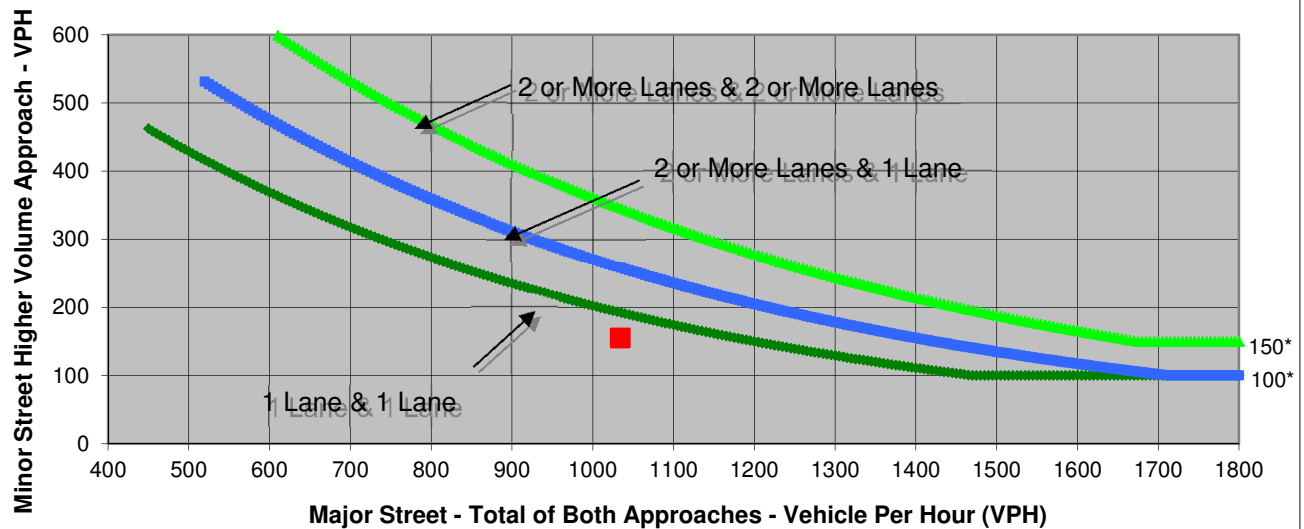
Turn Movement Volumes

	NB	SB	EB	WB
Left	217	2	7	6
Through	510	294	1	6
Right	2	9	147	2
Total	729	305	155	14

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street Knollwood Dr	Warrant Met
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,034	155	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street **Cambridge Rd**
 Minor Street **US 50 EB Ramps**

Project **Marble Valley EIR**
 Scenario **Existing Plus Project**
 Peak Hour **PM**

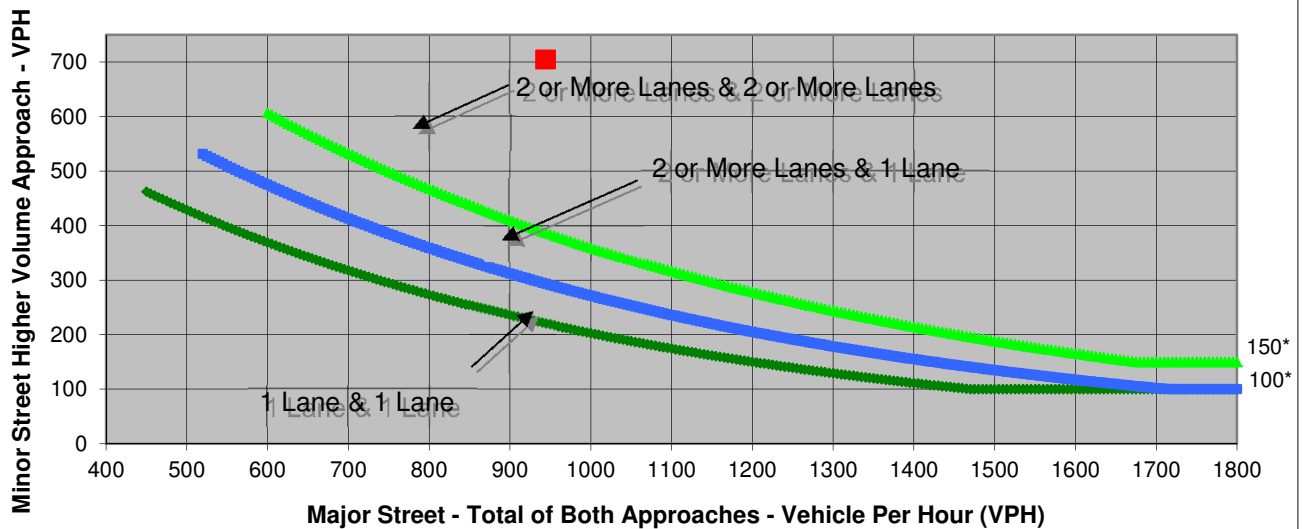
Turn Movement Volumes

	NB	SB	EB	WB
Left	108	0	448	0
Through	273	280	0	0
Right	0	283	256	0
Total	381	563	704	0

Major Street Direction

x	North/South
	East/West

Figure 4C-3. Warrant 3, Peak Hour



* 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 approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2012

	Major Street Cambridge Rd	Minor Street US 50 EB Ramps	Warrant Met
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	944	704	
* Note: Traffic Volume for Major Street is Total Volume of Both Approaches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

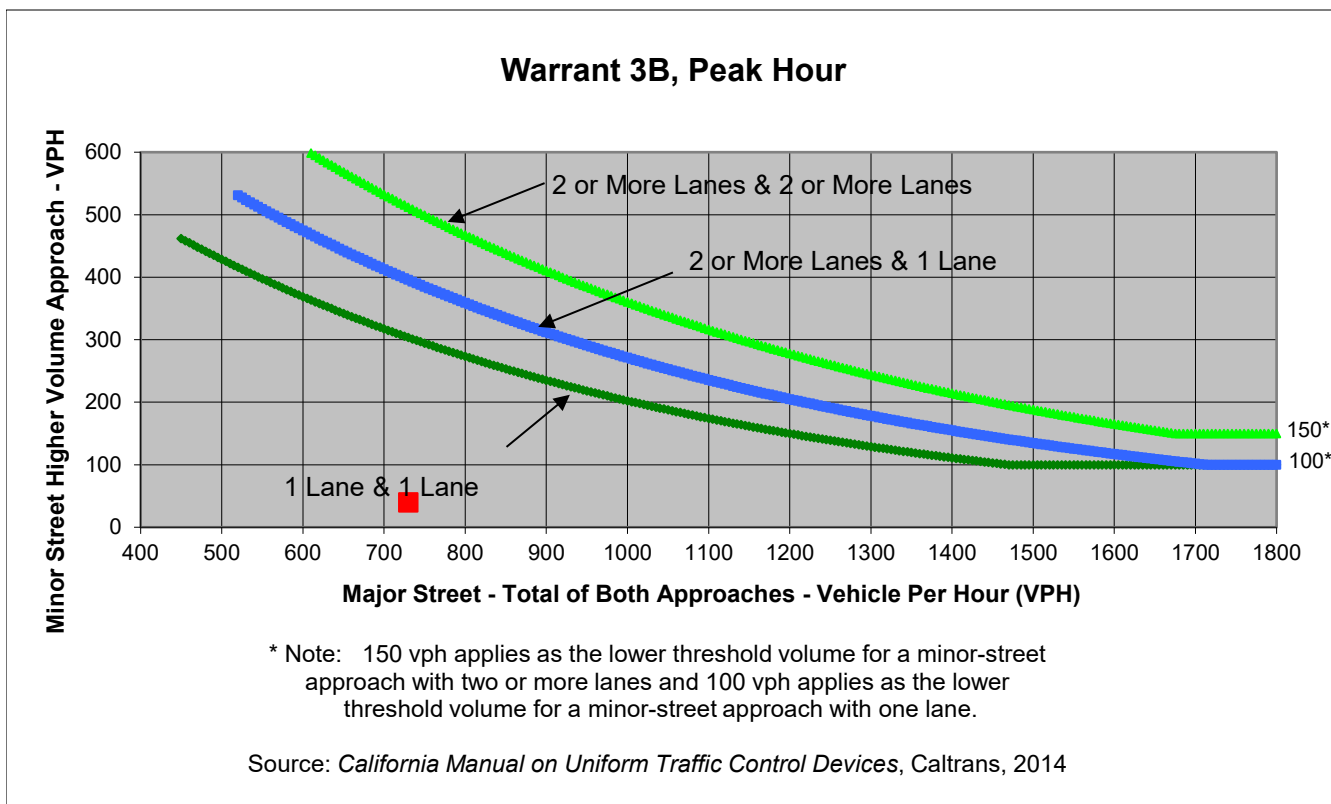
Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10		30	
Through	540	150		
Right		30	10	
Total	550	180	40	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Marble Valley Rd	Marble Mountain Rd	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	730	40	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	30	0
Through	540	150	0	0
Right	0	30	10	0
Total	550	180	40	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	11.7
Approach with Worst Case Delay	EB
Total Vehicles on Approach	40

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Cumulative No Project	0.1	40	770
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street Cambridge Rd
 Minor Street Country Club Dr

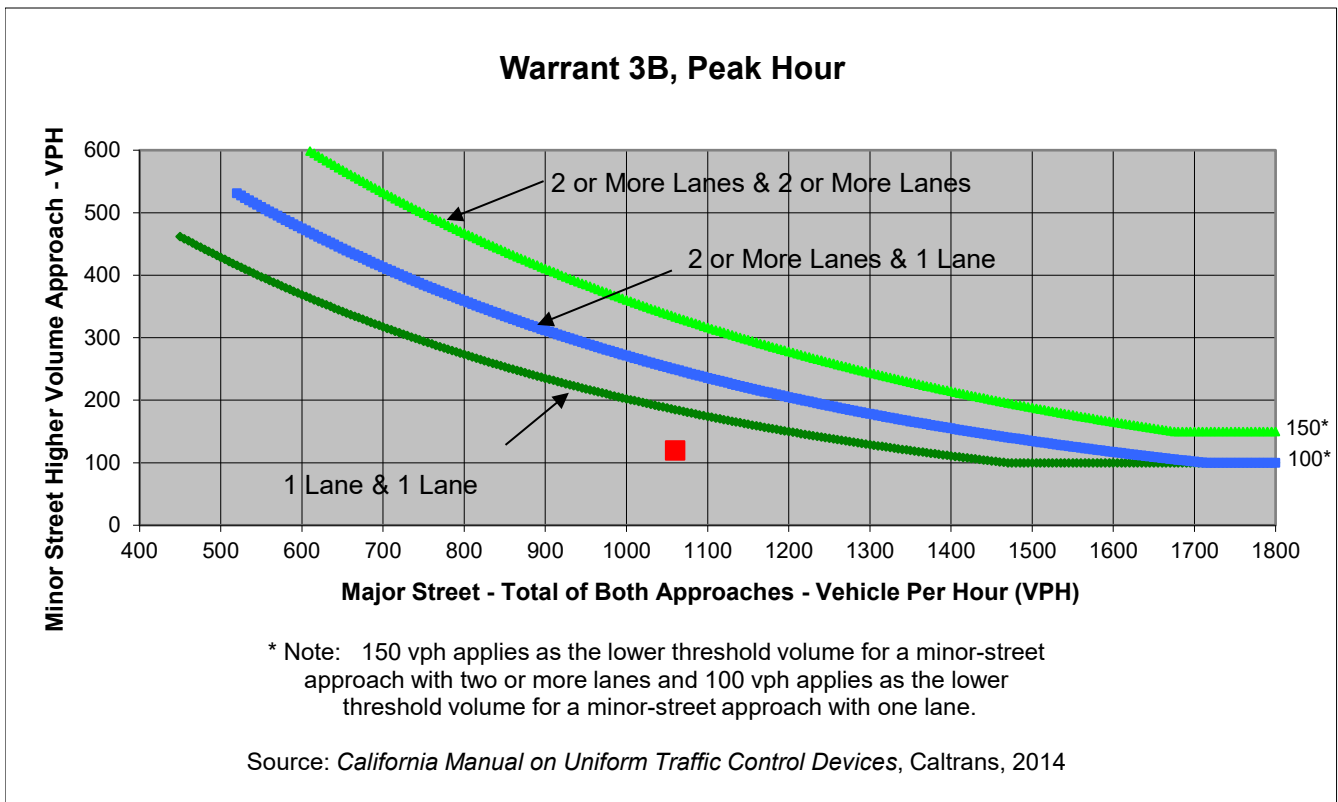
Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	10	80	80
Through	300	550	10	20
Right	30	150	30	10
Total	350	710	120	110

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Country Club Dr	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	1,060	120	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Country Club Dr

Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	10	80	80
Through	300	550	10	20
Right	30	150	30	10
Total	350	710	120	110

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	276.6
Approach with Worst Case Delay	EB
Total Vehicles on Approach	120

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative No Project	9.2	120	1,290
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Cambridge Rd
 Minor Street Knollwood Dr

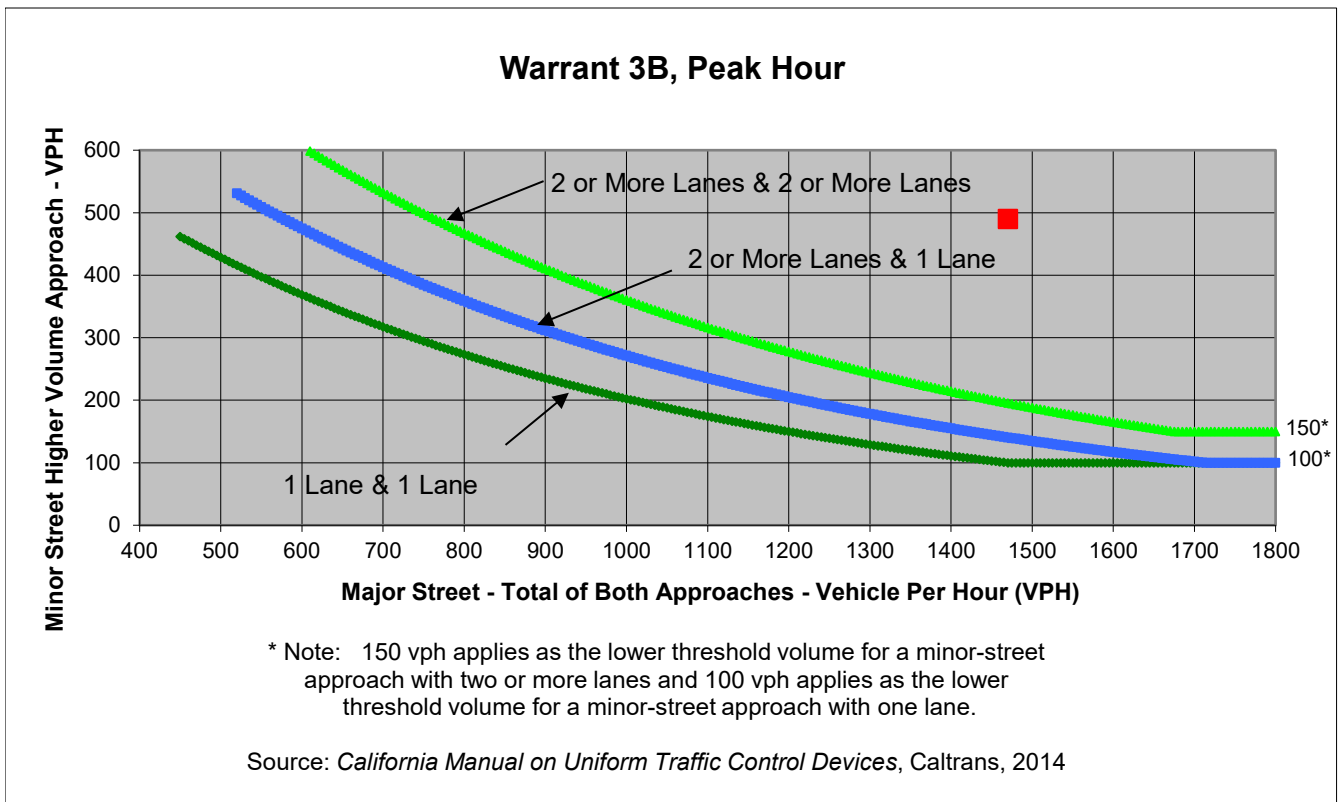
Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	260	80	10	200
Through	290	600	60	40
Right	230	10	420	40
Total	780	690	490	280

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Knollwood Dr	
Number of Approach Lanes	1	1	YES
Traffic Volume (VPH) *	1,470	490	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Knollwood Dr

Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	260	80	10	200
Through	290	600	60	40
Right	230	10	420	40
Total	780	690	490	280

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	300
Approach with Worst Case Delay	WB
Total Vehicles on Approach	280

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative No Project	23.3	490	2,240
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

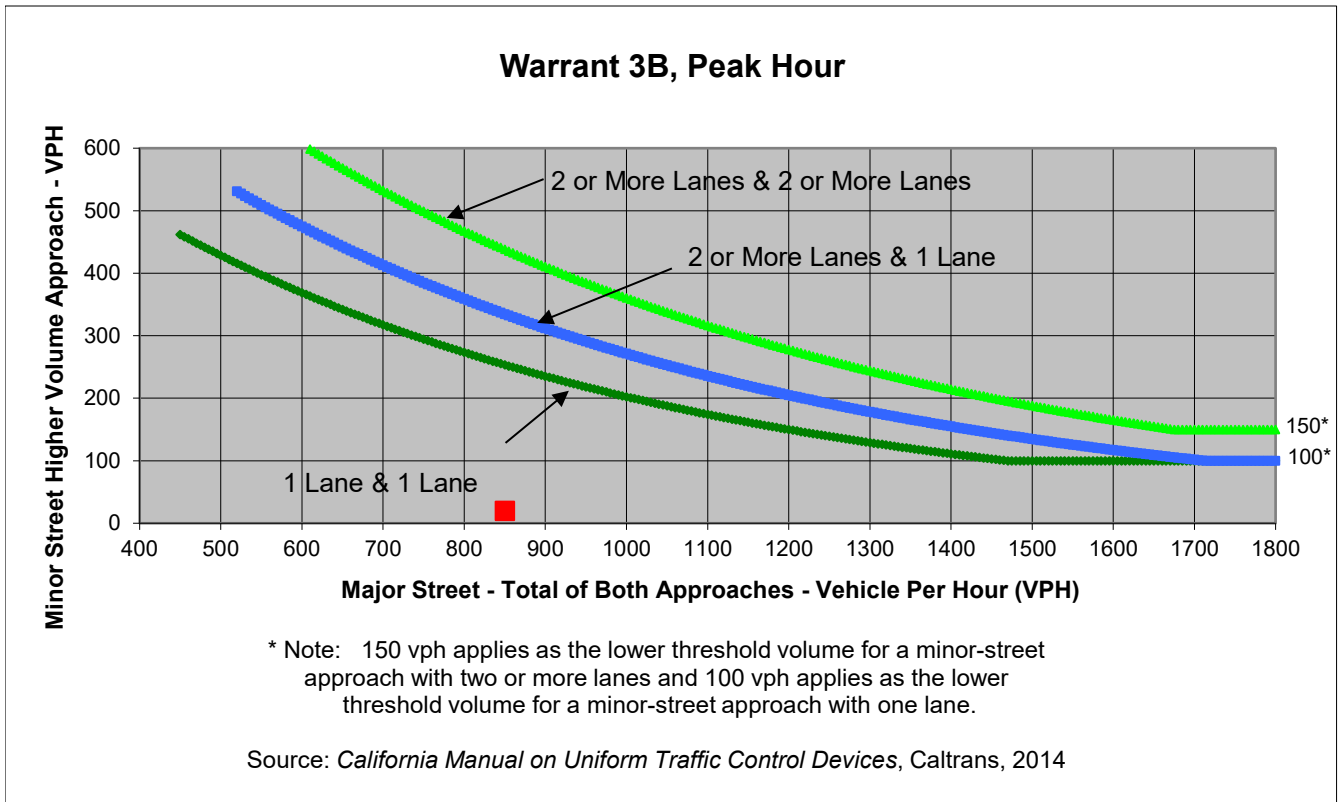
Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	10	0
Through	300	510	0	0
Right	0	30	10	0
Total	310	540	20	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Marble Valley Rd	Marble Mountain Rd	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	850	20	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	10	0
Through	300	510	0	0
Right	0	30	10	0
Total	310	540	20	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	13.1
Approach with Worst Case Delay	EB
Total Vehicles on Approach	20

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative No Project	0.1	20	870
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street Cambridge Rd
 Minor Street Country Club Dr

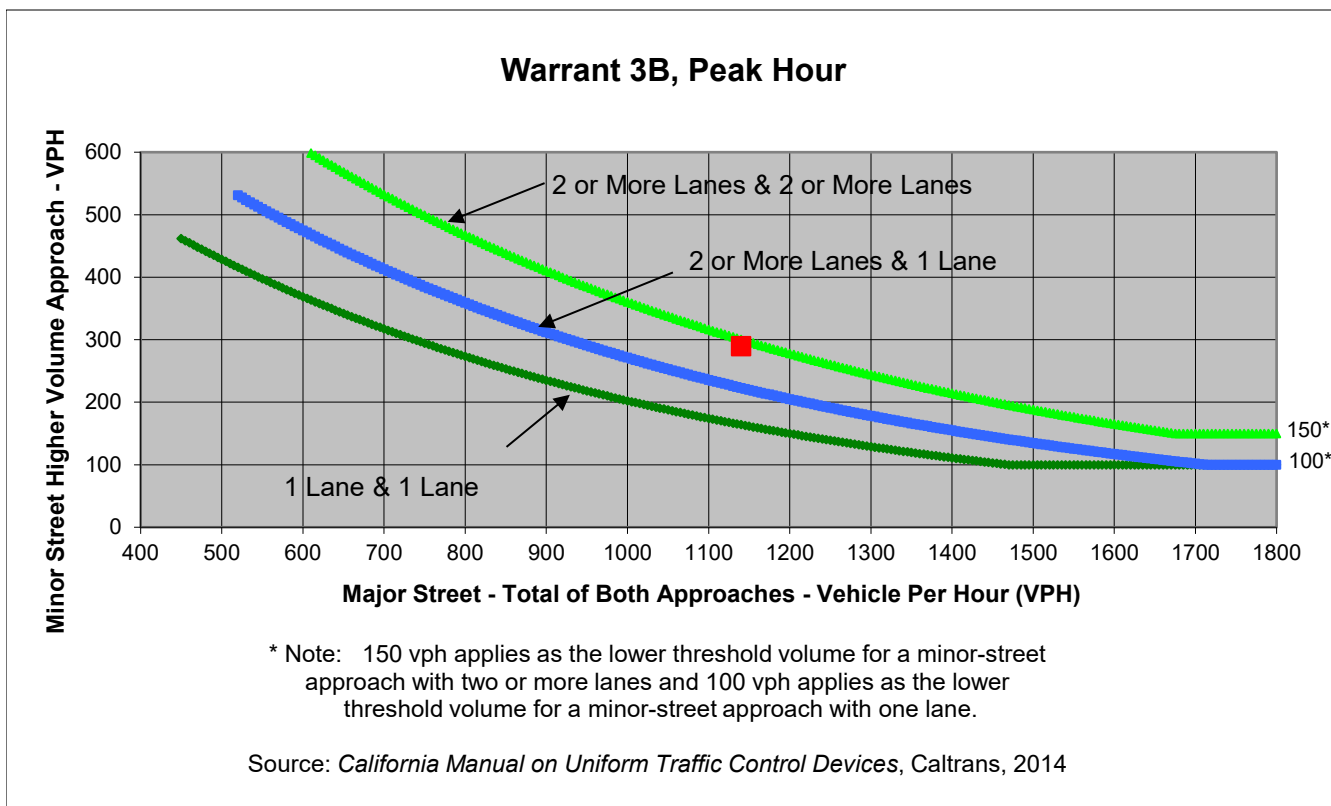
Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	10	260	20
Through	430	460	10	10
Right	60	160	20	10
Total	510	630	290	40

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Country Club Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,140	290	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Country Club Dr

Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	10	260	20
Through	430	460	10	10
Right	60	160	20	10
Total	510	630	290	40

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	168.6
Approach with Worst Case Delay	EB
Total Vehicles on Approach	290

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative No Project	13.6	290	1,470
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Cambridge Rd
 Minor Street Knollwood Dr

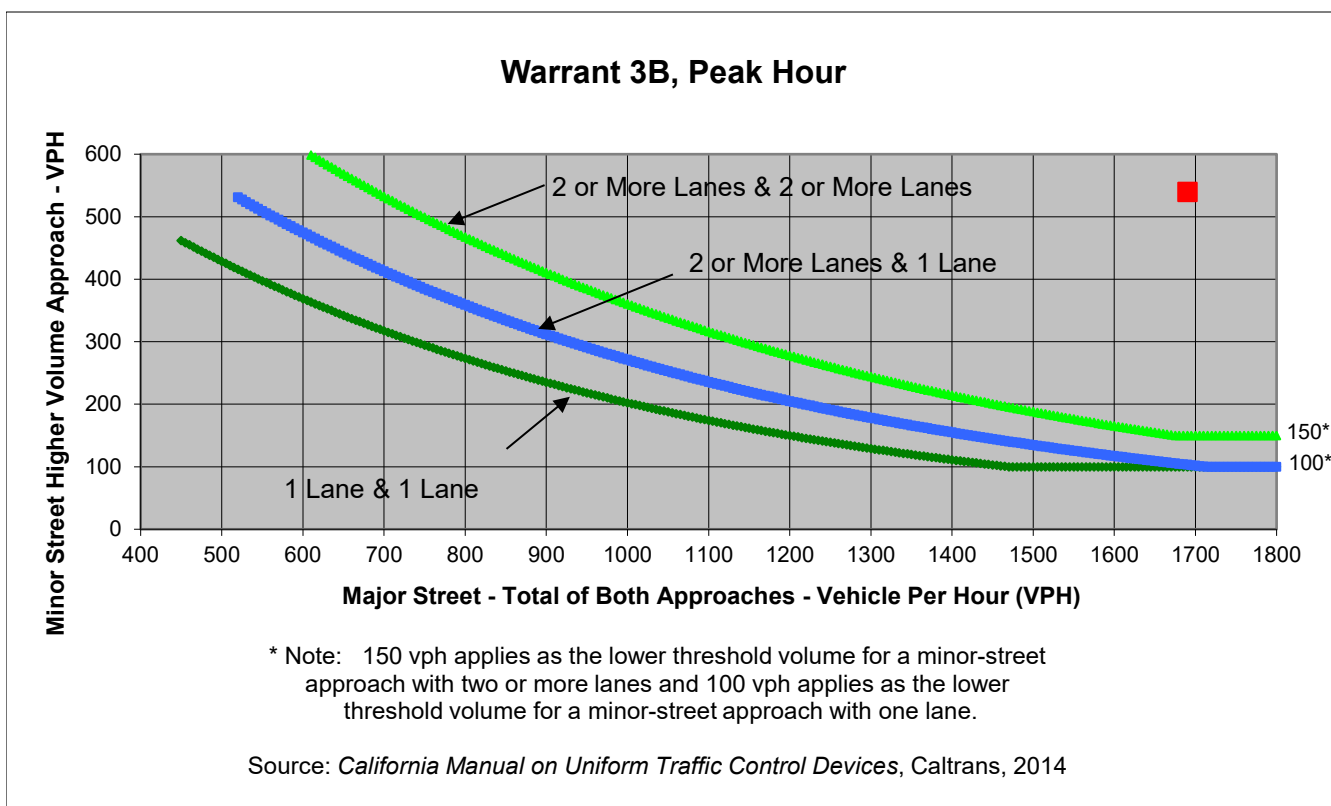
Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	430	80	10	350
Through	420	430	60	90
Right	320	10	280	100
Total	1,170	520	350	540

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Knollwood Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,690	540	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Knollwood Dr

Project Marble Valley EIR
 Scenario Cumulative No Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	430	80	10	350
Through	420	430	60	90
Right	320	10	280	100
Total	1,170	520	350	540

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	300
Approach with Worst Case Delay	WB
Total Vehicles on Approach	540

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative No Project	45	540	2,580
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

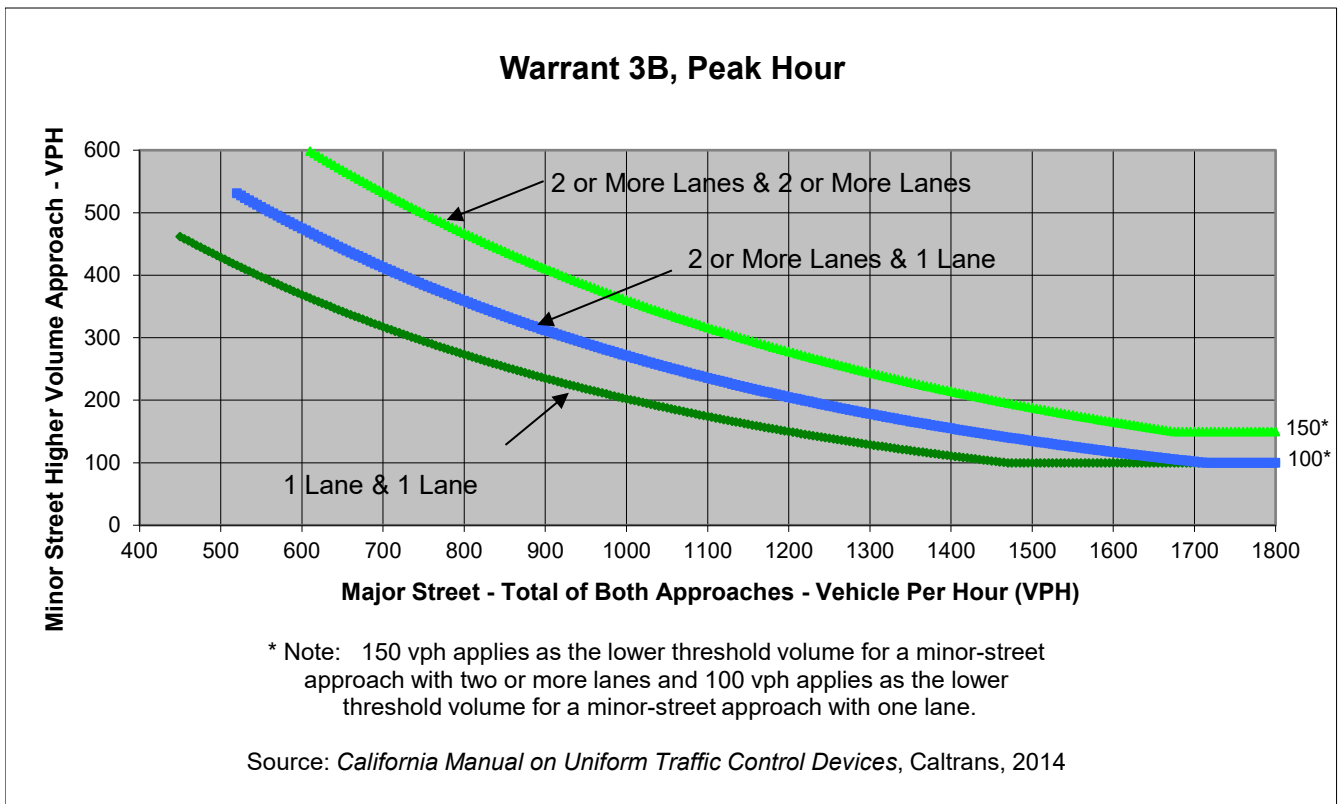
Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10		30	
Through	1,340	710		
Right		30	10	
Total	1,350	740	40	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Marble Valley Rd	Marble Mountain Rd	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	2,090	40	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	30	0
Through	1,340	710	0	0
Right	0	30	10	0
Total	1,350	740	40	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	42.9
Approach with Worst Case Delay	EB
Total Vehicles on Approach	40

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Plus Project	0.5	40	2,130
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street Cambridge Rd
 Minor Street Country Club Dr

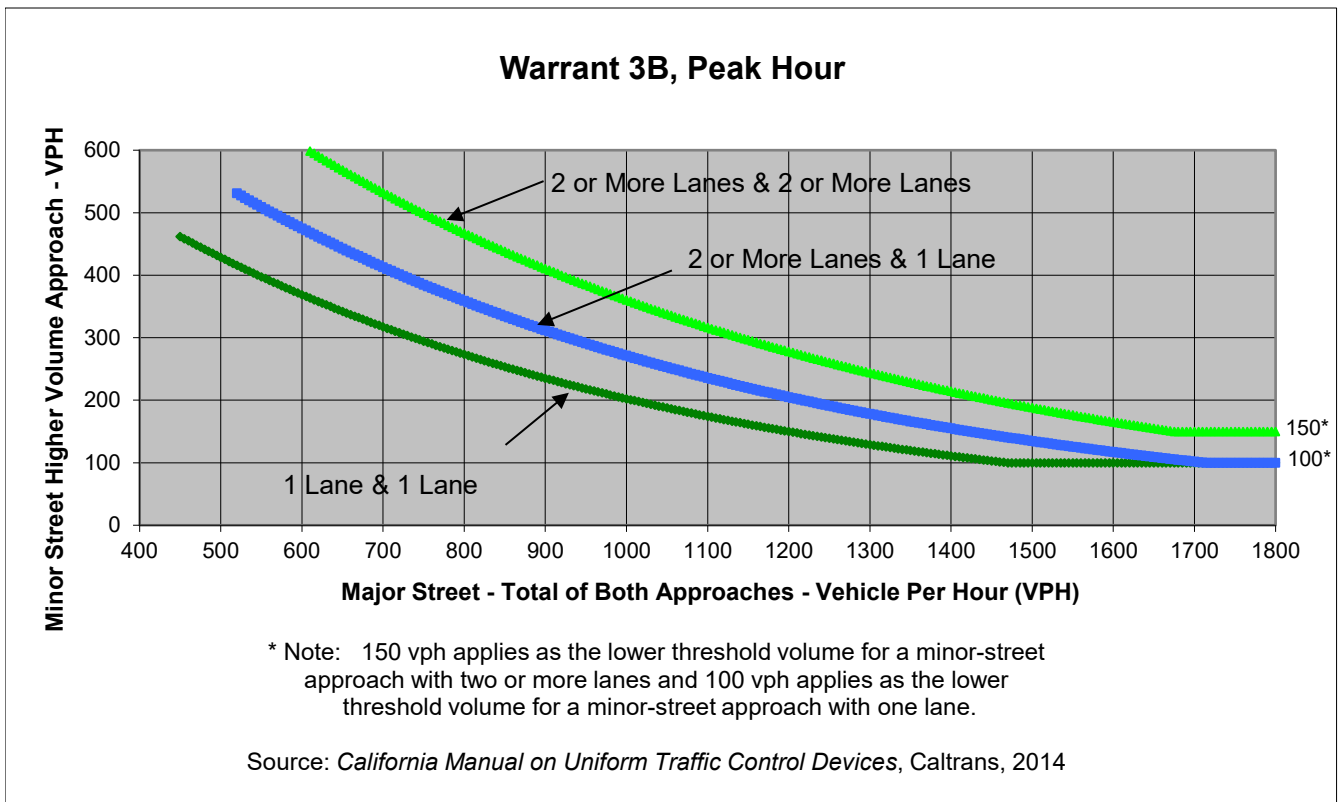
Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	20	90	20
Through	360	560	10	560
Right	30	150	30	150
Total	410	730	130	730

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Country Club Dr	
Number of Approach Lanes	1	1	YES
Traffic Volume (VPH) *	1,140	730	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Country Club Dr

Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	20	90	20
Through	360	560	10	560
Right	30	150	30	150
Total	410	730	130	730

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	82.1
Approach with Worst Case Delay	NB
Total Vehicles on Approach	410

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Plus Project	9.4	730	2,000
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Cambridge Rd
 Minor Street Knollwood Dr

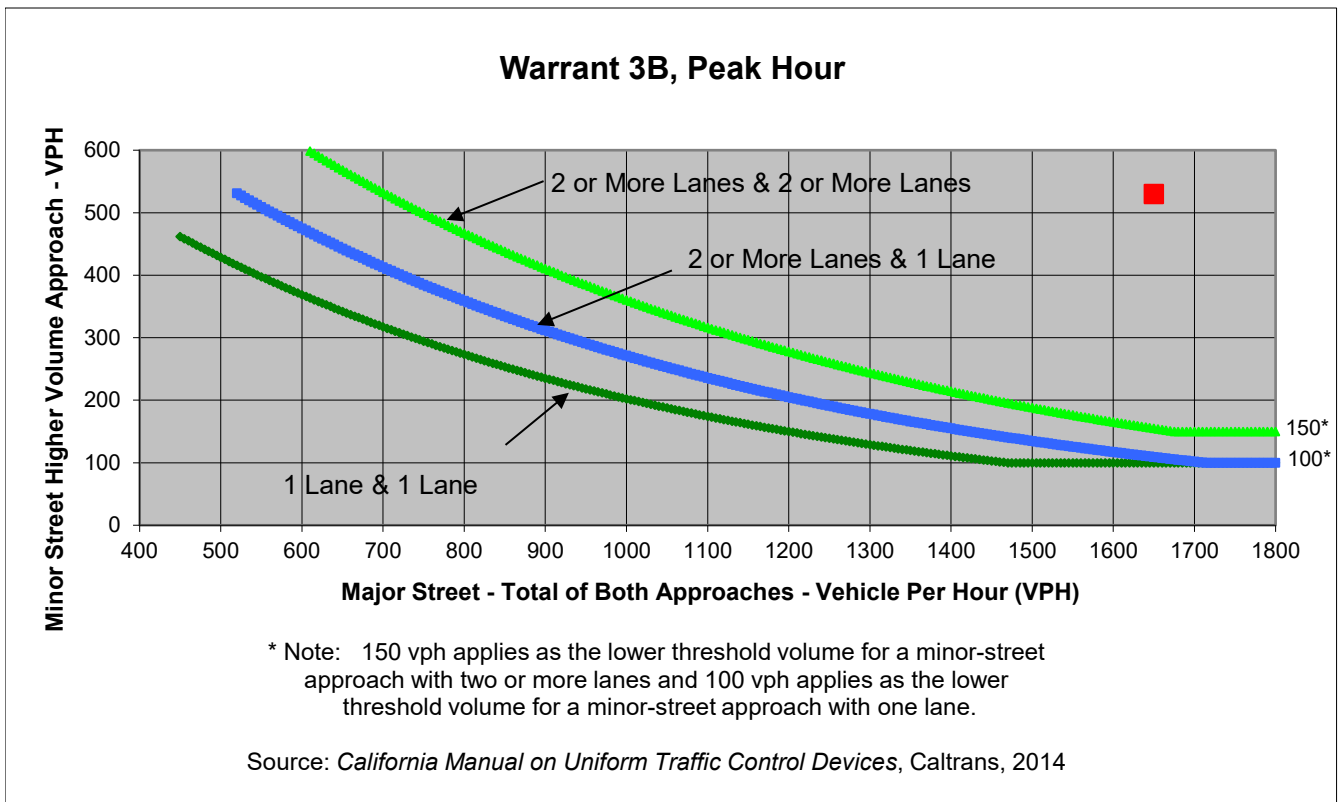
Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	320	70	10	210
Through	370	630	50	40
Right	250	10	470	40
Total	940	710	530	290

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Knollwood Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,650	530	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Knollwood Dr

Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour AM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	320	70	10	210
Through	370	630	50	40
Right	250	10	470	40
Total	940	710	530	290

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	300
Approach with Worst Case Delay	WB
Total Vehicles on Approach	290

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Plus Project	24.2	530	2,470
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

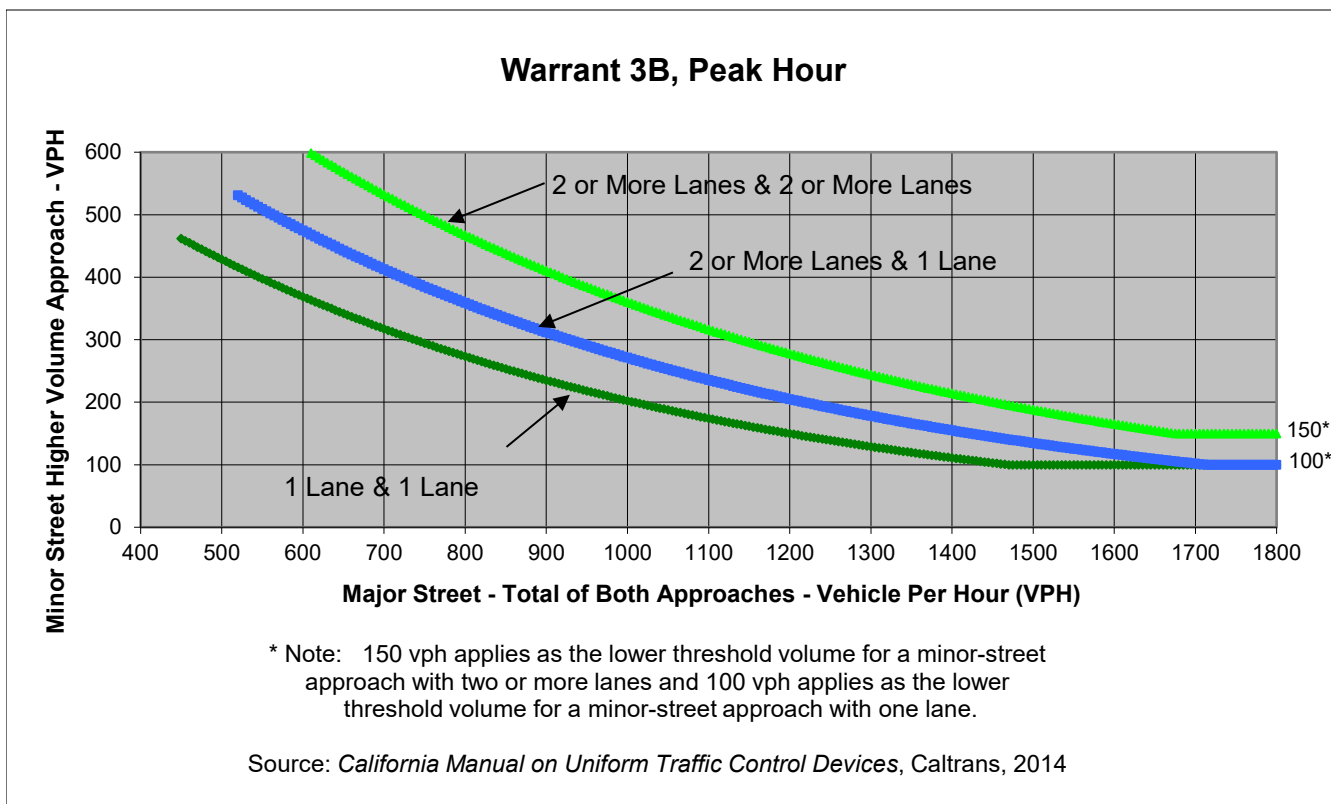
Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	10	0
Through	890	1,370	0	0
Right	0	30	10	0
Total	900	1,400	20	0

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Marble Valley Rd	Marble Mountain Rd	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	2,300	20	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Marble Valley Rd
 Minor Street Marble Mountain Rd

Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	0	10	0
Through	890	1,370	0	0
Right	0	30	10	0
Total	900	1,400	20	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	55
Approach with Worst Case Delay	EB
Total Vehicles on Approach	20

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Plus Project	0.3	20	2,320
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street Cambridge Rd
 Minor Street Country Club Dr

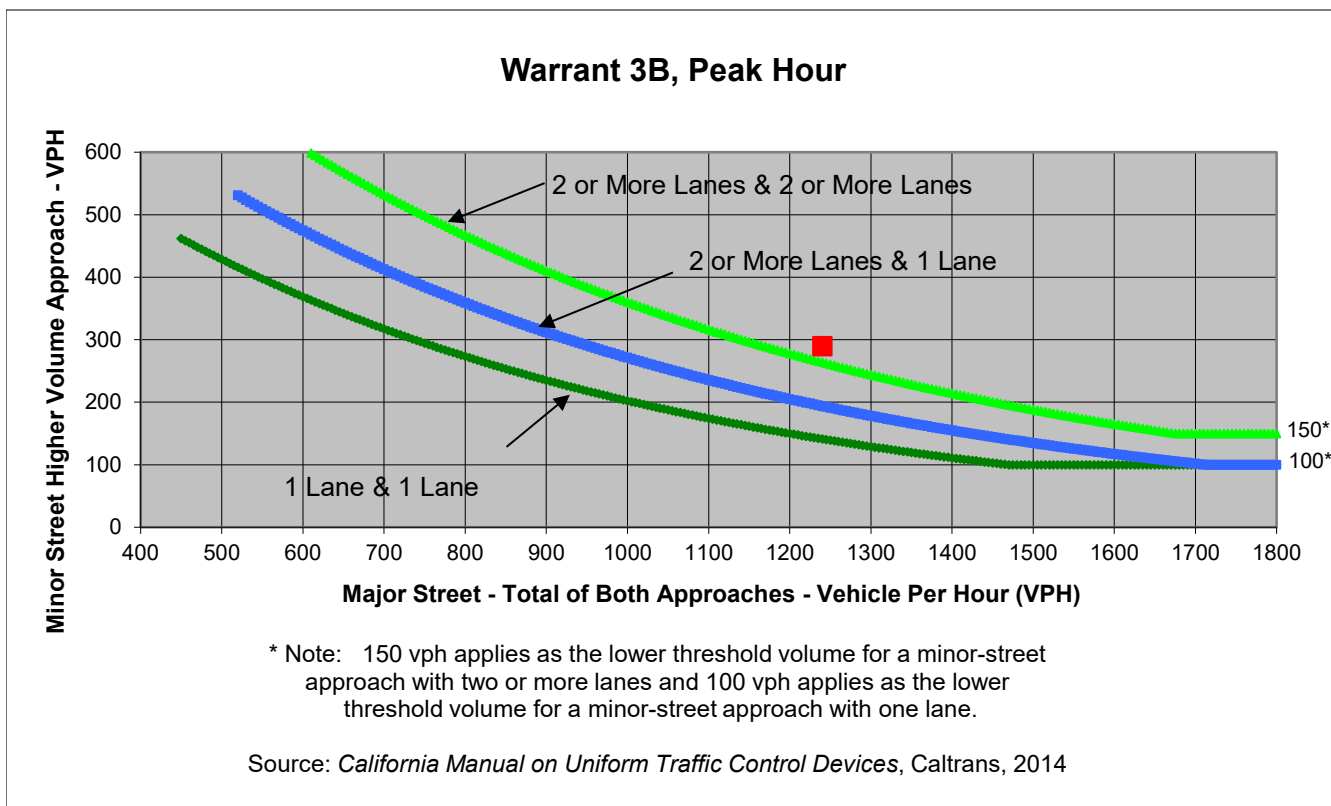
Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	10	230	30
Through	480	520	40	70
Right	70	140	20	10
Total	570	670	290	110

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Country Club Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,240	290	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Country Club Dr

Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	10	230	30
Through	480	520	40	70
Right	70	140	20	10
Total	570	670	290	110

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	264.7
Approach with Worst Case Delay	EB
Total Vehicles on Approach	290

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Plus Project	21.3	290	1,640
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



Major Street Cambridge Rd
 Minor Street Knollwood Dr

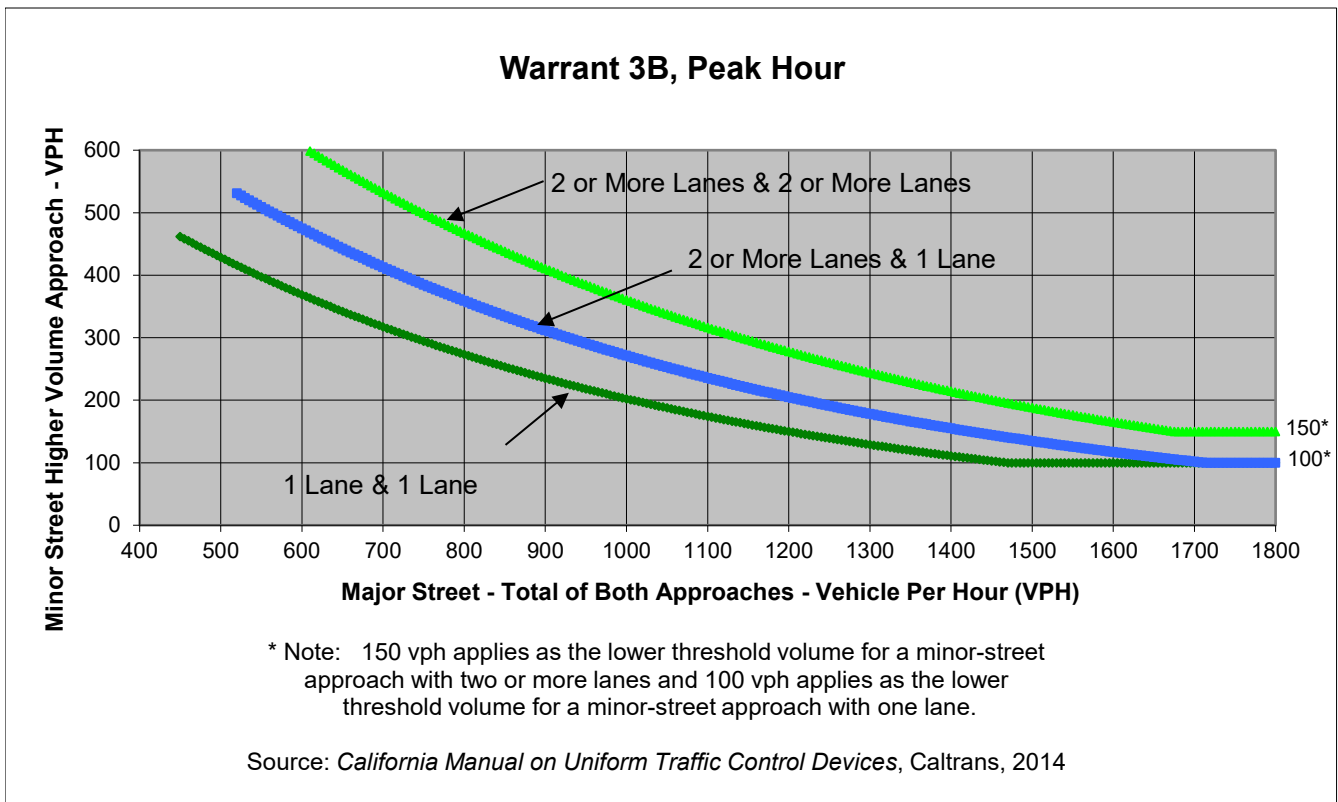
Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	480	70	10	370
Through	500	550	60	90
Right	340	10	330	90
Total	1,320	630	400	550

Major Street Direction

x	North/South
	East/West



	Major Street	Minor Street	Warrant Met
	Cambridge Rd	Knollwood Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	1,950	550	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Cambridge Rd
 Minor Street Knollwood Dr

Project Marble Valley EIR
 Scenario Cumulative Plus Project
 Peak Hour PM Peak Hour

Turn Movement Volumes

	NB	SB	EB	WB
Left	480	70	10	370
Through	500	550	60	90
Right	340	10	330	90
Total	1,320	630	400	550

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	300
Approach with Worst Case Delay	WB
Total Vehicles on Approach	550

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Plus Project	45.8	550	2,900
Limiting Value	4	100	800
Condition Satisfied?	Met	Met	Met
Warrant Met	<u>YES</u>		



MEMORANDUM

Date: November 12, 2012

To: El Dorado County Department of Transportation

Cc: Tom Howard, Marble Valley Company, LLC
Amy Wolfe, G3 Enterprises, Inc.

From: David B. Robinson, Fehr & Peers

Subject: *Marble Valley and Lime Rock Valley Access Evaluation*

RS12-3016

Fehr & Peers completed its access evaluation for the Marble Valley and Lime Rock Valley projects, as a follow up to several focused meetings with County Department of Transportation staff. At these meetings, we discussed access needs to support development of the Marble Valley and Lime Rock Valley projects. Specific discussion focused on the following:

- Regional and local travel destinations
- Primary and emergency access for both projects
- Viability of local circulation options
- Need for access concept for Marble Lake Boulevard to accommodate travel from both projects

This memorandum describes our evaluation methodology, provides an overview of regional and local-area travel characteristics, presents a detailed access concept for Marble Lake Boulevard, and outlines next steps.

METHODOLOGY

The following outlines the travel forecasting and operations analysis methodology.

Travel forecasting

We used a modified version of the Sacramento Area Council of Governments' (SACOG) regional travel forecasting model to develop traffic volume forecasts for this analysis. Traffic volume forecasts were based on a future year model that includes buildout of the Marble Valley and Lime Rock Valley projects and regional development levels that represent conditions beyond 2035.

Land use reflects maximum development of the residential and commercial uses in Marble Valley and Lime Rock Valley. Figure 1 shows planned site access for both projects.

Traffic Operations

Level of service analysis was performed using *Highway Capacity Manual (HCM)* methodology. The roundabout intersections were analyzed using *NCHRP Report 672 – Roundabouts: An Informational Guide, Second Edition* (Transportation Research Board, 2010) methodology, which is based on the *HCM 2010*, provides planning level analysis results and SimTraffic micro-simulation, which refines the *NCHRP Report 672* results by considering the characteristics and actions of individual drivers through the intersections. SimTraffic micro-simulation was used to analyze the couplet intersection.

The ultimate lane configurations for the proposed roundabouts were determined based on intersection level of service, vehicle queuing, and safety.

The following input parameters were used for the operations analysis:

- Peak Hour Factor (PHF) – 0.92
- Heavy Vehicle Percentage – 2%
- Vehicle and Driver Parameters – representative of American vehicles and drivers, rather than European characteristics (i.e. larger vehicles like SUV's and more conservative driver behavior through roundabout intersections)

REGIONAL AND LOCAL-AREA TRAVEL

We used the travel model to identify regional and local-area travel from Marble Valley and Lime Rock Valley into travel into districts (i.e., areas) to better understand how desirable certain areas will be for residents of Marble Valley and Lime Rock Valley. Project trips were grouped into the following districts:

Internal – represents trips that do not leave Marble Valley or Lime Rock Valley

Folsom – represents trips between Marble Valley and Lime Rock Valley and the City of Folsom

El Dorado Hills – represents trips between Marble Valley and Lime Rock Valley and El Dorado Hills

Cameron Park/Shingle Springs – represents trips between Marble Valley and Lime Rock Valley and the Cameron Park and Shingle Springs communities

Placerville – represents trips between Marble Valley and Lime Rock Valley and the City of Placerville

Other – represents trips between Lime Rock Valley and areas not captured by the other districts (Generally travel to other Sacramento and Placer County destinations)

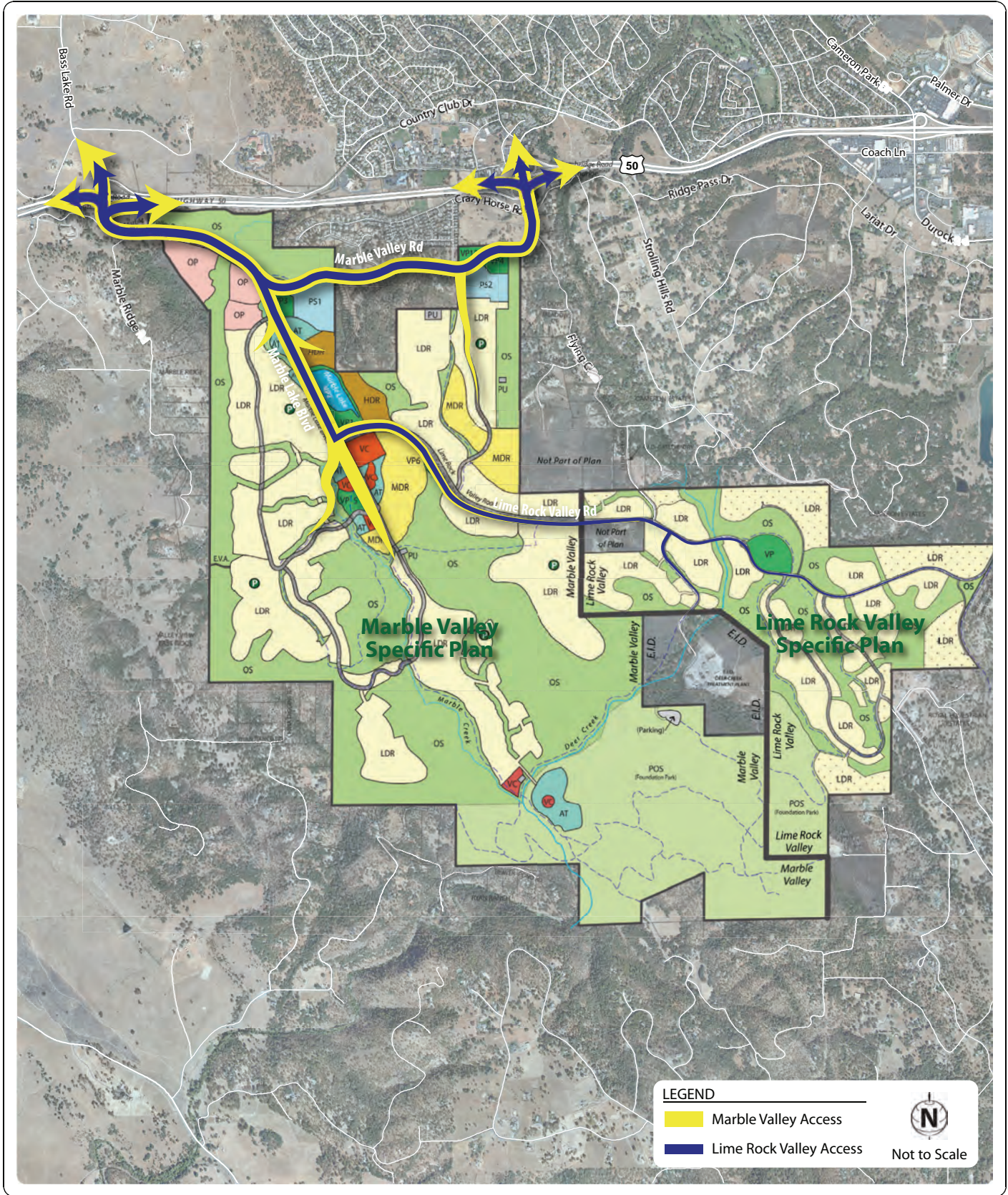
Table 1 Travel Distribution by District	
Roadway	Percent of Total Trips
Internal (Marble Valley and Lime Rock Valley)	28%
Folsom	12%
El Dorado Hills	8%
Cameron Park/ Shingle Springs	8%
Placerville	2%
Other (Sacramento and Placer County)	40%
Other (South El Dorado County and Amador County)	2%
Total Trips	100%
Source: Fehr & Peers, 2012	

Regional Travel

As shown in Table 1, the largest percentage of travel is to and from El Dorado Hills, Folsom, and Sacramento (Rows highlighted green in Table 1) and represents about 60 percent of travel from the projects compared to travel to and from Placerville and southern El Dorado County represent about two percent each. These results are consistent with current travel patterns with most jobs and services located west of the projects.

Local Travel

Travel between Marble Valley and Lime Rock Valley will account for about 30 percent of local project travel compared to eight percent for Cameron Park/Shingle Springs. Most of the internal travel will be school trips and trips associated with shopping, other services, and recreation. These are typically shorter length trips. As shown on Figure 1, both projects will rely on Marble Lake Boulevard and Marble Valley Road for access to U.S. 50 through the Bass Lake Road and Cambridge Road interchanges.



Several other access options were considered for Lime Rock Valley but are not included in the proposed plan for primary access roadways because: (1) the proposed primary access roadway without the other options will achieve the County's standard of level of service D; (2) adding any of the other access options is not necessary to provide acceptable operations on the primary access roadways; and (3) the other access options are private and have limited benefit for regional or local access due to several factors such as having land use and roadway characteristics that are not compatible with increased travel from the project, have low travel demand, or provide an indirect route to low demand travel destinations. The following roadway connections were considered:

- Flying C Road – Is a private gated road located north of Lime Rock Valley. Flying C Road connects to the Cambridge Road/U.S. 50 Interchange and is a primary access roadway serving the Cameron Estates development. Flying C Road is currently used by vehicles to access the El Dorado Irrigation District's Deer Creek Waste Water Treatment Plan.
- Shingle Lime Mine Road – Is a private local residential road that connects to Durock Road just east of the Cameron Park Drive/U.S. 50 Interchange.
- Amber Fields Drive – Is a private gated local residential road south of the Lime Rock Valley that connects to South Shingle Road.

MARBLE LAKE BOULEVARD

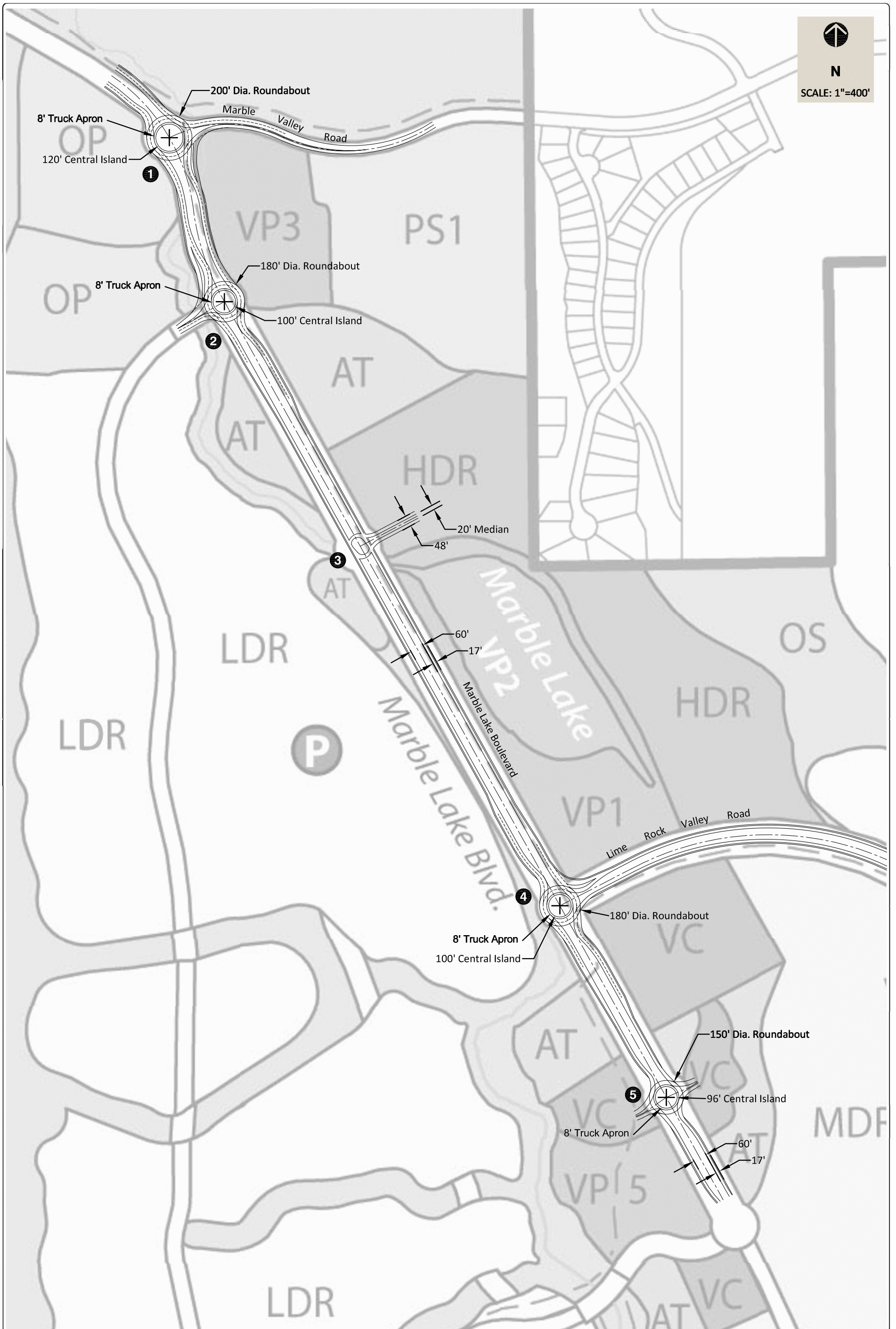
Figure 2 shows proposed intersection layout and lane assumptions for Marble Lake Boulevard necessary to support travel from Marble Valley and Lime Rock Valley given the planned access discussed above. The following summarizes the key design features of the proposed intersections:


1. Intersection 1 is a two-lane roundabout with a northbound-to-eastbound right-turn bypass lane.
2. Intersection 2 includes a two-lane roundabout with a southbound-to-westbound right-turn bypass lane.
3. Intersection 3 will be a couplet intersection with one northbound and one southbound lane on Marble Lake Boulevard (uncontrolled) and stop controls at all of the minor movements (eastbound and westbound).
4. Intersection 4 will be a two-lane roundabout with a westbound-to-northbound right-turn bypass lane.
5. Intersection 5 includes a single lane roundabout.

Marble Lake Boulevard would be four lanes from U.S. 50 to just south of Intersection 2. As shown in Table 2, the study intersections would operate acceptably with the proposed lane configurations. Detailed input assumptions and analysis results are included in Attachment A.

NEXT STEPS

Both the Marble Valley and Lime Rock Valley projects are moving forward with project development based on the site access and circulation information presented in this memorandum. Please review this information and contact me if you have any questions. We would appreciate your timely review of this information and confirmation that the planned access is acceptable.




N
 SCALE: 1"=400'

**TABLE 2
 LEVEL OF SERVICE RESULTS**

Intersection	2010 HCM								Micro-simulation ¹							
	AM Peak				PM Peak				AM Peak				PM Peak			
	Overall Intersection		Worst Approach		Overall Intersection		Worst Approach		Overall Intersection		Worst Approach		Overall Intersection		Worst Approach	
	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS	Delay ²	LOS
1.) Marble Lake Blvd/ Marble Valley Rd	9.8	A	17.3	C	16.3	C	27.3	D	2.0	A	3.8	A	3.3	A	5.7	A
2.) Marble Lake Blvd/ South Roundabout Rd	18.7	C	31.6	D	7.7	A	10.4	B	3.7	A	6.0	A	1.5	A	3.6	A
3.) Marble Lake Blvd/ Intersection 3	NA								NA	WBR: 33.8	D	NA		WBL: 29.6	D	
4.) Marble Lake Blvd/ Lime Rock Valley Rd	12.3	B	22.5	C	10.9	B	13.4	B	NA							
5.) Marble Lake Blvd/ Intersection 5	7.1	A	8.6	A	8.1	A	9.4	A	NA							

Notes: ¹ The multi-lane roundabout intersections (Intersections 1 and 2) were analyzed in VISSIM. The two-stage stop controlled intersection (Intersection 3) was analyzed in SimTraffic.
² Delay is reported in seconds per vehicle.
 Source: Fehr & Peers, 2012

Appendix B

**Biological Resources Assessment for the
Village of Marble Valley Specific Plan Project**

Biological Resources Assessment for the Village of Marble Valley Specific Plan Project

El Dorado County, California

Prepared For:

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September 2024

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
°F	degrees Fahrenheit
ACE	Areas of Conservation Emphasis
BCC	USFWS Bird of Conservation Concern
BRA	Biological Resource Assessment
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
DEIR	Draft EIR
DPS	Distinct Population Segment
ECORP	ECORP Consulting, Inc.
EID	El Dorado Irrigation District
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
PG&E	Pacific Gas and Electric Company
PJD	Preliminary Jurisdictional Determination
Project	Village of Marble Valley Specific Plan Project
SSC	California Species of Special Concern

Term	Definition
Study Area	The Project and the Offsite Infrastructure Improvements Areas
US	United States Route
USFWS	U.S. Fish and Wildlife Service
VMVSP	Village of Marble Valley Specific Plan
WBWG	Western Bat Working Group

1.0 INTRODUCTION

ECORP Consulting, Inc. (ECORP) conducted a Biological Resources Assessment (BRA) for the Village of Marble Valley Specific Plan (VMVSP) Project (Project), which is located in El Dorado County, California. The results of this assessment are intended to support the Impact Analysis-Biological Resources section of the Draft Environmental Impact Report (DEIR) for the VMVSP (ICF 2024) in accordance with the California Environmental Quality Act (CEQA).

1.1 Project Location and Description

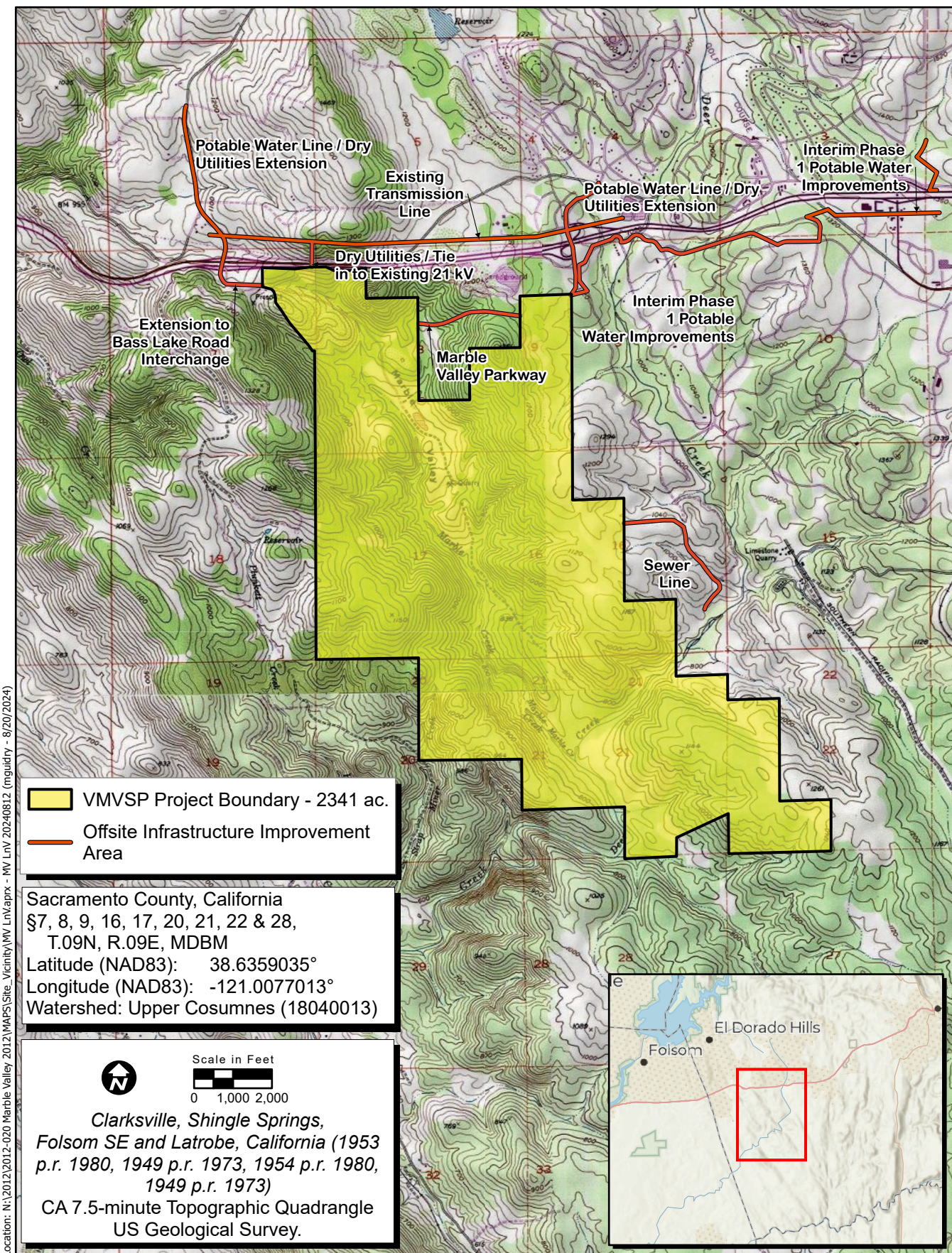
The DEIR provides a detailed description of the Project and its location.

1.2 Study Area

The Study Area for this BRA includes the Project and the offsite infrastructure improvements areas. The 2,341-acre VMVSP corresponds to Sections 7, 8, 9, 16, 17, 20, 21, 22, and 28, Township 9 North, Range 9 East (Mount Diablo Base and Meridian) of the "Clarksville, California," "Shingle Springs, California," "Folsom SE, California," and "Latrobe, California," 7.5-minute quadrangles (U.S. Geological Survey 1980a, 1973a, 1980b, 1973b, respectively) (Figure 1-1). The approximate center of the VMVSP is located at latitude 38.6359035° and longitude -121.0077013° (NAD83) within the Upper Cosumnes Watershed (Hydrological Unit Code 18040013; Natural Resources Conservation Service [NRCS] et al., 2024).

The offsite infrastructure improvement areas—roads, water, and wastewater line extensions, as well as oak woodland restoration—would be needed to support the Project. These include the following:

- A new connection of Marble Valley Parkway to the Bass Lake Road interchange with United States Route (US) 50 (Marble Valley Parkway/Bass Lake Road).
- A new section of Marble Valley Parkway between the east and west sides of the northern portion of the Project Area (Marble Valley Parkway connection).
- Extension of the new Marble Valley Parkway access road to the Cambridge Road interchange with US 50 (Marble Valley Parkway/Cambridge Road).
- Interim improvements to the US 50/Cambridge Road interchange.
- Interim improvements to the US 50/Bass Lake Road interchange.
- Interim potable water improvements for Phase I within roadways.
- New water transmission lines along Bass Lake and Cambridge Roads.
- An area east of the Project Area that encompasses two infrastructure components:
 - Extensions of water and wastewater lines to connect to existing El Dorado Irrigation District (EID) infrastructure (EID water [potentially recycled water] and wastewater lines).
 - Potential extension of the new Lime Rock Valley Road to Deer Creek Road.



Location: N:\2012\2012-020 Marble Valley 2012\MAPS\Site_Vicinity\MV_LnVaprx - MV_LnV 20240812 (mguidry - 8/20/2024)

Map Date: 8/16/2024
 Sources: ESRI, USGS

Figure 1-1. Project Location and Vicinity

In addition, extensions to connect to electricity and natural gas services would be necessary to serve the Project. Pacific Gas and Electric Company (PG&E) would construct these dry utility connections.

PG&E electricity service would be extended from a 21-kilovolt single-phase overhead line that would connect to two existing substations in Clarksville to the west and in Shingle Springs to the east (Marble Valley Company, LLC 2023).

PG&E may provide natural gas service to the Project Area in one of several ways that are described in Chapter 2 of the DEIR. The connections to the Project Area would follow Bass Lake Road or Cambridge Road.

1.3 Purpose of this Biological Resources Assessment

The purpose of this BRA is to confirm prior assessments regarding the potential for the occurrence of special-status plant and animal species or their habitats as well as other sensitive or protected resources such as migratory birds, sensitive natural communities, riparian habitat, oak woodlands, and potential Waters of the U.S. or State, including wetlands, within the Study Area. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols, and based on the assessment, no such surveys are recommended at this time. For certain species with known or likely habitat, the mitigation measures require such surveys in closer proximity to construction. The conclusions and recommendations presented in this report are based upon a review of available literature and the results of site reconnaissance field surveys.

For the purposes of this assessment, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or are candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- are listed or are candidates for future listing as threatened or endangered under the California ESA;
- meet the definitions of endangered or rare under Section 15380 of the CEQA Guidelines;
- are identified as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW);
- are birds identified by the U.S. Fish and Wildlife Service (USFWS) as Birds of Conservation Concern (USFWS 2021);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" or "rare, threatened, or endangered in California but more common elsewhere" (California Rare Plant Ranks [CRPRs] 1 and 2 or CRPRs 3 and 4);
- are plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.); or
- are fully protected in California in accordance with the California Fish and Game Code, Sections 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), or 5515 (fishes);

- are a Western Bat Working Group species designated as “high” or “medium” on the priority matrix; or
- are species on the CDFW Watch List.

2.0 REGULATORY SETTING

The DEIR provides a complete discussion of the regulatory setting that pertains to this Project.

3.0 METHODS

3.1 Literature Review

ECORP biologists reviewed the existing available information for the Study Area. Literature sources included current and historical aerial imagery, any previous biological studies conducted for the area (Section 3.3), topographic mapping, soil survey mapping available from the NRCS *Web Soil Survey*, USFWS National Wetlands Inventory (NWI) mapping, the USFWS Critical Habitat Mapper, the National Marine Fisheries Service (NMFS) Essential Fish Habitat Mapper, and other relevant literature as cited throughout this document. ECORP reviewed the following resources to identify special-status plant and wildlife species that have been previously documented in or near the Study Area:

- CDFW's California Natural Diversity Database (CNDDDB) data for the "Clarksville, California," "Shingle Springs, California," "Folsom SE, California," and "Latrobe, California" 7.5-minute quadrangles and the surrounding 12 quadrangles (CDFW 2024a).
- CNPS Rare Plant Inventory data for the "Clarksville, California," "Shingle Springs, California," "Folsom SE, California," and "Latrobe, California" 7.5-minute quadrangles and the surrounding 12 quadrangles (CNPS 2024b).
- The USFWS Information for Planning and Consultation Resource Report List for the Study Area (USFWS 2024);
- NMFS Resources data for the "Clarksville, California," "Folsom SE, California," and "Latrobe, California" 7.5-minute quadrangle (National Oceanic and Atmospheric Administration [NOAA] 2022). Please note that there is no NMFS Resources data for the "Shingle Springs, California," 7.5-minute quadrangle.

Appendix A provides the results of the database queries. Section 4 of this BRA evaluates each special-status species that ECORP identified in the literature review for its potential to occur in the Study Area based on available information concerning species habitat requirements and distribution, occurrence data, and the findings of the site reconnaissance.

3.2 Site Reconnaissance

ECORP biologists Peter Balfour, Griffin Capehart, Stephanie Castle, Keith Kwan, and Hannah Stone conducted site reconnaissance visits on August 8 and 9, 2024. The biologists visually assessed representative vegetation communities in the VMVSP and collected the following biological resource information:

- Characteristics and approximate boundaries of vegetation communities and other land cover types.
- A preliminary aquatic resources assessment of the Offsite Infrastructure Improvement Areas.
- Plant and animal species or their sign directly observed.

The biologists qualitatively assessed vegetation communities as compared to previous biologist studies that were conducted for the Study Area. Vegetation community classification was based on the classification systems presented in the Manual of California Vegetation, and the biologists gave special attention to identifying those portions of the Study Area that have the potential to support special-status species or sensitive habitats. Photographs were taken during the reconnaissance site visits to provide visual representations of the conditions within the Study Area.

The offsite infrastructure improvement areas include existing public roadways (accessible), undeveloped lands adjacent to VMVSP (inaccessible), and developed roadways within gated communities (inaccessible). The biologists assessed the accessible roadways for potentially occurring protected natural resources. The biologists assessed the inaccessible areas by interpreting aerial photography and making observations from public roadways or the Study Area. Aerial photographs used for this assessment included images available through Google Earth Pro[®] (Google, Inc. 2024) and drone photographs taken on August 16, 2024.

3.3 Focused Surveys

The following studies were prepared for the Study Area to date:

- *Special-Status Plant Survey for Marble Valley, El Dorado County, California* (ECORP 2005).
- *Wetland Delineation for Marble Valley Property, El Dorado County, California* (ECORP 2006).
- *Revised Wetland Delineation, Marble Valley* (ECORP 2007).
- *Special-Status Plant Survey for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013a).
- *Valley Elderberry Longhorn Beetle Survey for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013b).
- *California Red-Legged Frog (*Rana draytonii*) Habitat Assessment for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013c).
- *Foothill Yellow-Legged Frog Survey Results and Habitat Assessment for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013d).
- *California Tiger Salamander (*Ambystoma californiense*) Habitat Assessment for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013e).
- *Results of Surveys for Blainville's Horned Lizard and Western Spadefoot Toad for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013f).
- *Western Pond Turtle Survey Results for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013g).
- *Special-Status Fish Assessment for the Village of Marble Valley Specific Plan (El Dorado County, California)* (ECORP 2013h).

- *2012 Dry Season 90-Day Report of Findings Regarding Federally-Listed Branchiopods for the Village of Marble Valley Specific Plan (El Dorado County, California) (ECORP 2013i).*
- *Special-Status Nesting Bird Survey for the Village of Marble Valley Specific Plan, El Dorado County, California (ECORP 2013j).*
- *California Rapid Assessment Method Analysis for the Village of Marble Valley Specific Plan, El Dorado County, California (ECORP 2013k).*
- *2012–2013 Wet Season 90-Day Report of Findings Regarding Federally-Listed Branchiopods for the Village of Marble Valley Specific Plan (El Dorado County, California) (ECORP 2013l).*
- *Bat Study Report for the Village of Marble Valley Specific Plan (El Dorado County, California) (Wyatt 2013).*
- *Biological Resources Study and Important Habitat Mitigation Plan for Oak Woodlands at the Village of Marble Valley, El Dorado County, California (ECORP 2014a).*
- *Preliminary Wetland Assessment for the Village of Marble Valley Specific Plan Off-Site Infrastructure Improvement Areas, El Dorado County, California (ECORP 2014b).*
- *Special-Status Species Assessment for the Village of Marble Valley Specific Plan Off-Site Infrastructure Improvement Areas, El Dorado County, California (ECORP 2014c).*
- *Off-Site Oak Canopy Impacts for the Villages of Marble Valley Specific Plan Area, El Dorado County, California (ECORP 2014d).*
- *Special-Status Species Assessment for the Village of Marble Valley Specific Plan Off-Site Infrastructure Improvement Areas, El Dorado County, California (ECORP 2015).*
- *Oak Resources Technical Report: Oak Woodlands and Oak Tree Individuals (ECORP 2018).*
- *Village of Marble Valley Project, El Dorado County, California: Impacts to Brandegees Clarkia (ECORP 2019a).*
- *Foothill Yellow-Legged Frog Survey Results, The Village of Marble Valley Specific Plan, El Dorado County, California (ECORP 2019b).*

The following vegetation community discussion is based on the data provided from previous studies and summarized in the DEIR (ICF 2024) as well as the results of ECORP's reconnaissance site visits on August 8 and 9, 2024 and drone inspections on August 16, 2024.

4.0 RESULTS

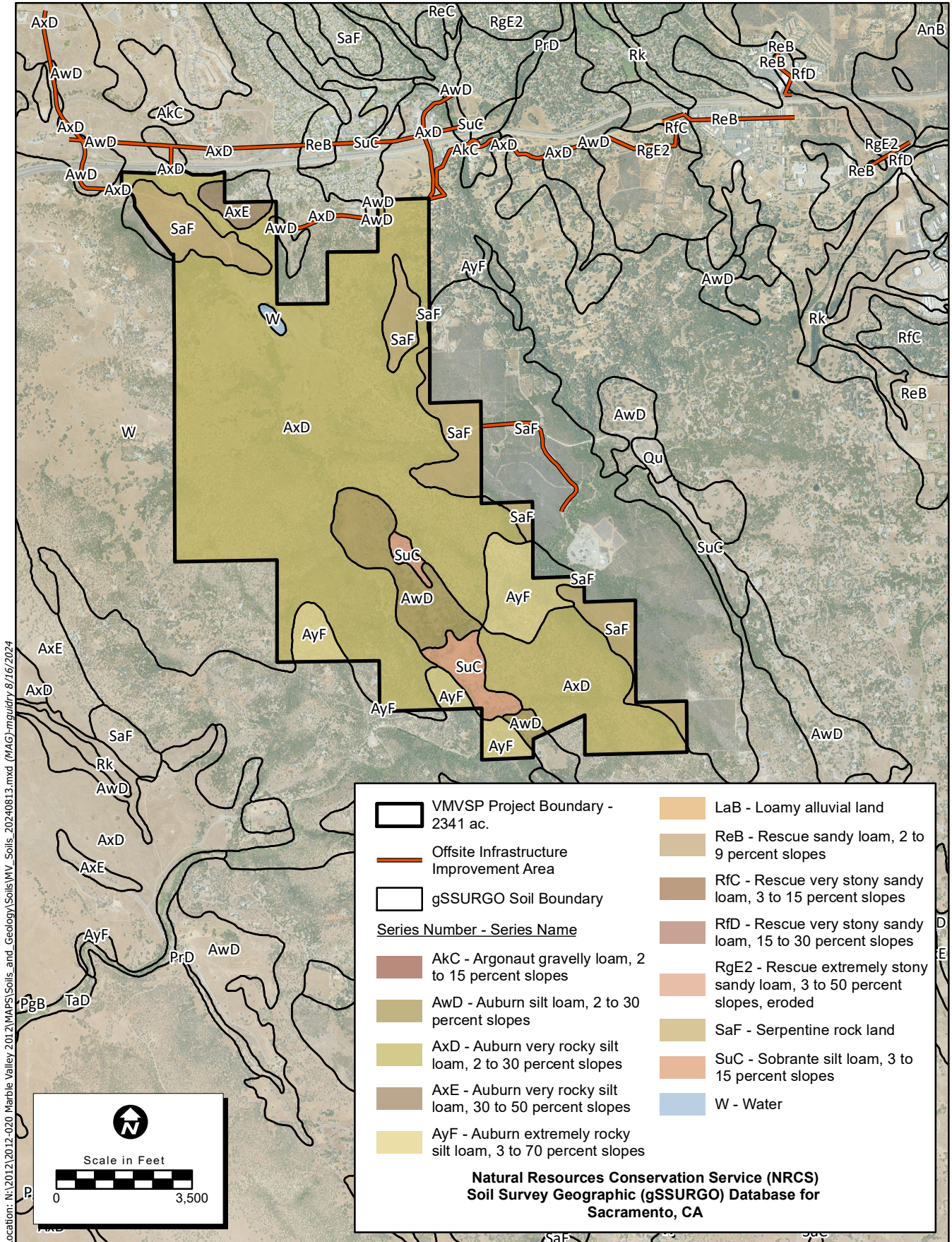
4.1 Site Characteristics and Land Use

The Proposed Project Area is primarily hilly terrain that is vegetated with oak woodland and savannah, with lowland riparian oak woodland along Marble and Deer Creeks and chaparral on several southern aspect hill slopes. The elevation of the site ranges from approximately 680 to 1,300 feet above mean sea level. Marble Creek enters the Project Area from its northern boundary and flows in a southerly direction into Deer Creek, which flows from east to west through the southern portion of the Project Area. The hilly portions of the Project Area are drained by various intermittent drainages and seasonal wetland swales. There are two former limestone quarries in the northern portion of the Project Area (ICF 2024). The Project Area is situated in the northern Sierra Nevada Foothills subdivision of the California floristic province (Jepson eFlora 2024). The average winter minimum temperature is 35 degrees Fahrenheit (°F) and the average summer maximum temperature is 90.9°F at the "Placerville, CA" station, which is approximately 11 miles east of the Project Area (NOAA 2024a). The average annual precipitation in the vicinity of the Project Area is approximately 27.24 inches (NOAA 2024b).

The land use designations that surround the Study Area include rural residential and residential development and undeveloped woodland and scrubland. Appendix B provides representative photographs of the VMVSP. There are no significant or notable changes in the conditions, site characteristics, or land use from the prior surveys to this BRA.

4.2 Soils and Geology

ECORP staff obtained soil survey mapping for the Study Area from the NRCS *Web Soil Survey* (Figure 4-1). Table 4-1 provides an overview of the soil series mapped within the Study Area and key features of the soil series such as hydric rating or the presence of serpentine or gabbroic soil material.



Location: N:\2012\2012-020 Marble Valley 2012\MAPS\Soils and_Geology\Soils\MV_Soils_20240813.mxd (MAG) mguidry 8/16/2024

Map Date: 8/16/2024
Sources: REY, NRCS, Esri, NAIP (2022)

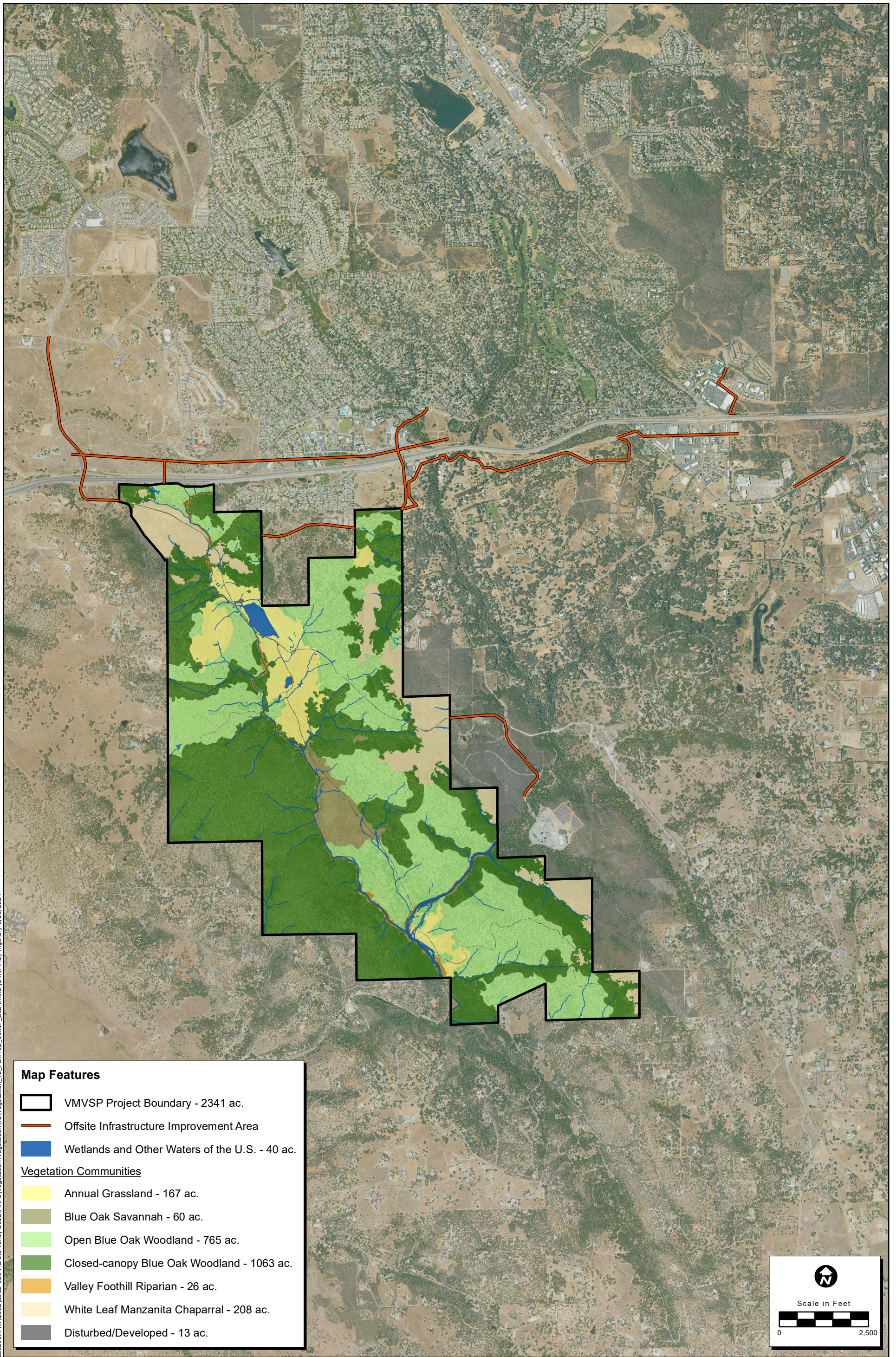
Figure 4-1. Natural Resource Conservation Service Soil Types

Table 4-1. Soil Series Mapped in the Study Area			
Map Unit Symbol	Map Unit Name	Rating	Hydric Soil Rating
AkC	Argonaut gravelly loam, 2 to 15 percent slopes	Residuum weathered from andesite and/or residuum weathered from metasedimentary rock	No
AwD	Auburn silt loam, 2 to 30 percent slopes	Residuum weathered from basic igneous rock and/or basic residuum weathered from metamorphic rock	No
AxD	Auburn very rocky silt loam, 2 to 30 percent slopes	Residuum weathered from basic igneous rock and/or basic residuum weathered from metamorphic rock	No
AxE	Auburn very rocky silt loam, 30 to 50 percent slopes	Residuum weathered from basic igneous rock and/or basic residuum weathered from metamorphic rock	No
AyF	Auburn very rocky silt loam, 3 to 70 percent slopes	Amphibolite schist	No
LaB	Loamy alluvial land	Recent, mixed alluvium derived from volcanic and sedimentary rock	No
ReB	Rescue sandy loam, 2 to 9 percent slopes	Residuum weathered from gabbrodiorite	No
RfC	Rescue very stony loam, 3 to 15 percent slopes	Residuum weathered from gabbrodiorite	No
RfD	Rescue very stony loam, 15 to 30 percent slopes	Residuum weathered from gabbrodiorite	No
RgE2	Rescue extremely stony sandy loam, 3 to 50 percent slopes	Residuum weathered from gabbrodiorite	No
SaF	Serpentine rock land	Serpentinite	No
SuC	Sobrante silt loam, 3 to 15 percent slopes	Residuum weathered from metamorphic rock	No
W	Water	n/a	n/a

4.3 Vegetation Communities and Land Cover Types

The following sections describe vegetation communities and land cover types within the Study Area as described in previous studies and observed during the site reconnaissance. Appendix C provides a full list of plants that ECORP biologists observed onsite. Figure 4-2 depicts the approximate extent of the vegetation communities and land cover types. Figure 4-3 depicts the approximate extents of the vegetation communities and land cover types in the offsite infrastructure improvement areas.

Location: N:\2012\2012-020 Marble Valley\2012\MAPS\Vegetation\Vegetation_v2_FullProp_11x17_2024.mxd (DW/MAG)-mguldry 8/29/2024



Map Features

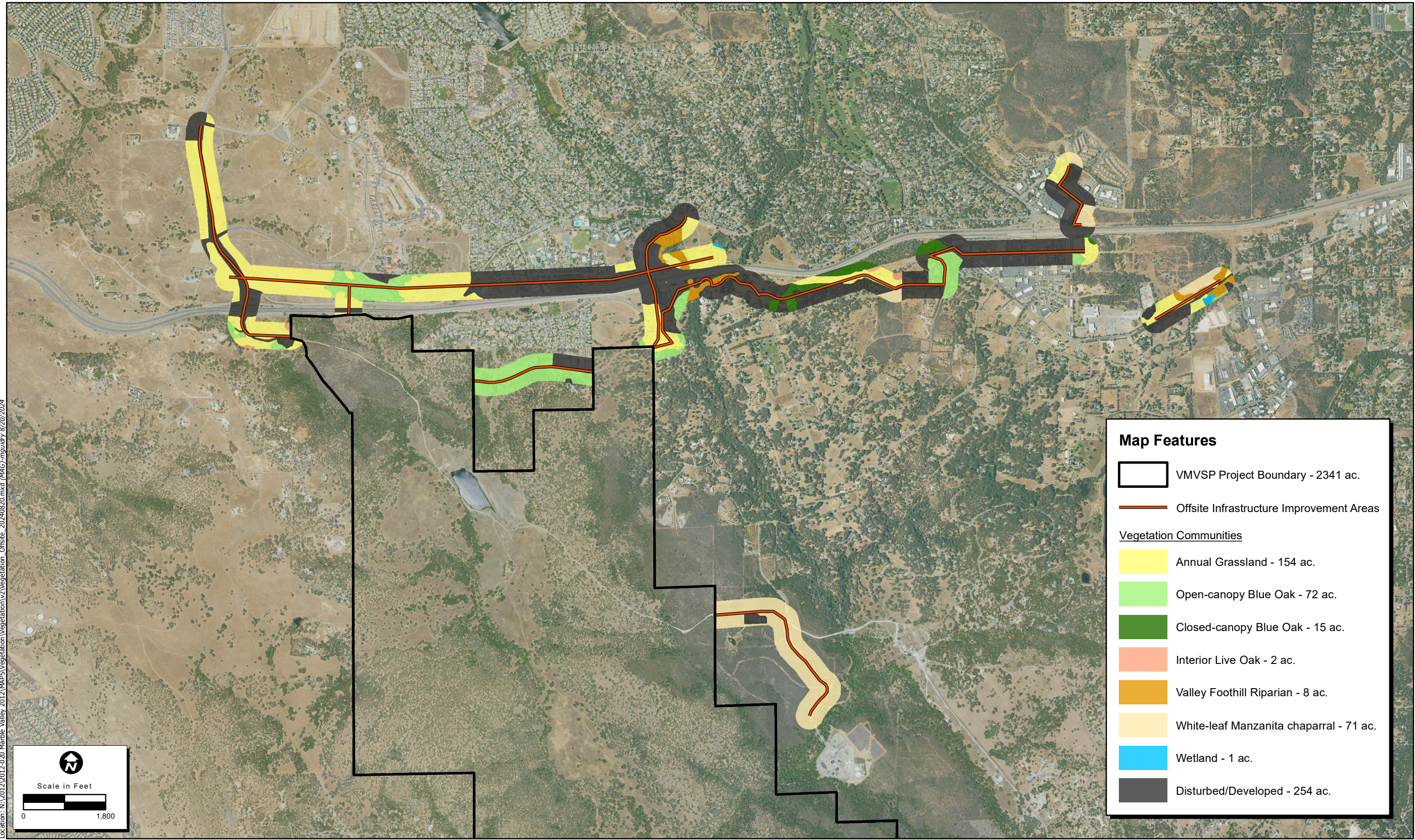
- VMVSP Project Boundary - 2341 ac.
- Offsite Infrastructure Improvement Area
- Wetlands and Other Waters of the U.S. - 40 ac.

Vegetation Communities

- Annual Grassland - 167 ac.
- Blue Oak Savannah - 60 ac.
- Open Blue Oak Woodland - 765 ac.
- Closed-canopy Blue Oak Woodland - 1063 ac.
- Valley Foothill Riparian - 26 ac.
- White Leaf Manzanita Chaparral - 208 ac.
- Disturbed/Developed - 13 ac.

Map Date: 8/27/2024
Photo Source: NAIP (2022)

Figure 4-2. Vegetation Communities



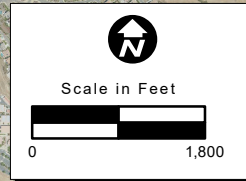
Map Features

- VMVSP Project Boundary - 2341 ac.
- Offsite Infrastructure Improvement Areas

Vegetation Communities

- Annual Grassland - 154 ac.
- Open-canopy Blue Oak - 72 ac.
- Closed-canopy Blue Oak - 15 ac.
- Interior Live Oak - 2 ac.
- Valley Foothill Riparian - 8 ac.
- White-leaf Manzanita chaparral - 71 ac.
- Wetland - 1 ac.
- Disturbed/Developed - 254 ac.

Location: N:\1\2012\2012-020 Marble Valley 2012\MAPS\Vegetation\Vegetation_Offsite_20240820.mxd (MAG)imguidr_8/20/2024



Map Date: 8/20/2024
Photo Source: NAIP 2012

Figure 4-3. Vegetation Communities – Offsite Infrastructure Improvement Areas

4.3.1 Annual Grassland

The annual grassland community is found in relatively small patches in the interior of the Study Area. Portions of the annual grassland in the Study Area appear to have been historically grazed by cattle; however, these portions are now fallow. The annual grassland onsite is characterized by a dominance of non-native annual grasses that include medusahead grass (*Elymus caput-medusae*), wild oats (*Avena* sp.), and soft brome (*Bromus hordeaceus*) with a low diversity of native species. Narrow tarplant (*Holocarpha virgata*), rose clover (*Trifolium hirtum*), and vetch (*Vicia sativa*) are dominant forbs scattered throughout the annual grassland. Overgrazed or otherwise heavily disturbed portions of the annual grassland support dense mats of thatched medusahead grass and large patches of invasive forbs that include yellow star-thistle (*Centaurea solstitialis*), Klamath weed (*Hypericum perforatum*), and milk thistle (*Silybum marianum*).

This vegetation community can be characterized as the wild oats and annual brome grasslands semi-natural alliance (CNPS 2024b). Semi-natural alliances are strongly dominated by non-native plants that have become naturalized in the State, do not have State rarity rankings, and are not considered sensitive natural communities.

4.3.2 Blue Oak Woodland

The blue oak woodland community is located throughout the majority of the Study Area. Blue oak (*Quercus douglasii*) is mostly dominant in the canopy, which varies in tree density from very open and savannah-like to continuous. The blue oak savannah has sparsely scattered blue oaks (less than 10 percent canopy cover) and an herbaceous understory that is dominated by medusahead grass and other commonly found non-native invasive plants that were described for the annual grassland community. The open blue oak woodland has greater than 10% tree canopy with blue oak as the dominant species, scattered interior live oaks (*Quercus wislizenii*), and sparsely scattered gray pines (*Pinus sabiniana*). Its understory is dominated by annual grasses and a few forbs, except on and around rocky outcrops where poison-oak (*Toxicodendron diversilobum*), spike-moss (*Selaginella* sp.), and phacelia (*Phacelia* sp.) dominate. Predominant understory species include wild oats, ripgut brome (*Bromus diandrus*), false brome (*Brachypodium distachyon*), barbed goatgrass (*Aegilops triuncialis*) and Italian thistle (*Carduus pycnocephalus*). In the closed-canopy blue oak woodland, blue oak is dominant or codominant with interior live oak with a dense shrubby understory that includes California coffeeberry (*Frangula californica*), toyon (*Heteromeles arbutifolia*), poison-oak, and holly-leaf redberry (*Rhamnus ilicifolia*) with a sparse herbaceous layer.

Some smaller patches within the blue oak woodland are dominated by interior live oak, but otherwise have a similar vegetation composition as previously described. Finer-level vegetation mapping may reveal patches of interior live oak woodland.

Both the blue oak woodland and interior live oak woodland alliances have a State rarity ranking of S4 and are not considered sensitive natural communities (CNPS 2024b). There are sensitive associations within both alliances (CDFW 2024a), but the composition of the vegetation community that was observed onsite does not resemble any known sensitive associations.

4.3.3 Valley Foothill Riparian

Valley foothill riparian vegetation is mapped along the seasonal creek and perennial creek. Riparian vegetation along most of the seasonal creek can be characterized as the Fremont cottonwood forest and woodland alliance (CNPS 2024b). Riparian vegetation along the southern end of the seasonal creek and along the perennial creek can be characterized as the valley oak riparian forest and woodland alliance (CNPS 2024b). Fremont cottonwood forest within the Study Area includes Fremont's cottonwood (*Populus fremontii*) as dominant in the canopy, red willow (*Salix laevigata*) as dominant in the subcanopy, and arroyo willow (*Salix lasiolepis*) as dominant in the shrub layer; hydrophytic herbaceous species, as described in the aquatic resources section, are dominant in the channel. The valley oak riparian includes valley oak (*Quercus lobata*) as dominant in the canopy and Oregon ash (*Fraxinus latifolia*) as dominant in the subcanopy with scattered white alder (*Alnus rhombifolia*), black walnut (*Juglans hindsii*), and common buttonbush (*Cephalanthus occidentalis*); hydrophytic herbaceous species, as described in the aquatic resources section, are dominant in the channel.

Both the Fremont cottonwood forest and woodland alliance and valley oak riparian forest and woodland alliance are considered sensitive natural communities, with State rarity rankings of S3.2 and S3, respectively (CNPS 2024b).

4.3.4 Whiteleaf Manzanita Chaparral

The whiteleaf manzanita (*Arctostaphylos viscida*) chaparral is located in the northeastern and western portions of the Study Area in association with serpentine soils. The shrub canopy is mostly continuous with whiteleaf manzanita as dominant or co-dominant with chamise (*Adenostoma fasciculatum*), and toyon sparsely scattered throughout. Other predominant species observed in small openings include sticky monkeyflower (*Diplacus aurantiacus*), silvery hairgrass (*Aira caryophyllea*), and false brome.

Chamise is dominant in patches of the chaparral in the northeastern portion of the Study Area. Finer-level vegetation mapping may reveal patches of chamise chaparral. The shrub canopy within the chamise-dominated areas ranges from intermittent, where patches of shrubs are interspersed with herbaceous openings, to continuous, where shrub cover is dense and few herbaceous species are present except in small, disturbed openings. Whiteleaf manzanita, toyon, buck brush (*Ceanothus cuneatus*) and emergent gray pines are present within these areas at lower densities. Predominant grasses include soft brome, wild oat, nit grass (*Gastridium phleoides*), rat-tail fescue (*Festuca myuros*), silvery hairgrass, and false brome. Predominant forbs include hairy hawkbit (*Leontodon saxatilis*), California plantain (*Plantago erecta*), common catchfly (*Silene gallica*), narrow-leaved flax (*Linum bienne*), and pink grass (*Petrorhagia dubia*).

Neither the whiteleaf manzanita or chamise chaparral alliances are considered sensitive natural communities, with State rarity rankings of S4 and S5, respectively (CNPS 2024b). There are sensitive associations within both alliances (CDFW 2024a), but the composition of the chaparral observed onsite does not resemble any known sensitive associations.

4.3.5 Disturbed/Developed

The disturbed or developed land cover type consists of compacted dirt, gravel, and paved roads. The dirt and gravel roads are mostly devoid of vegetation, except for the edges and center of the road between tire tracks in some areas. Where vegetated, vegetation was similar to that described for the vegetation communities the roads travels through, with higher densities of non-native invasive vegetation like yellow star-thistle. The paved roads are found in the offsite infrastructure improvement areas.

4.4 Aquatic Resources

The aquatic features that were delineated and verified by the U.S. Army Corps of Engineers in a Preliminary Jurisdictional Determination letter dated August 16, 2012 (Regulatory Division SPK-2012-00209) include wetlands (i.e., seasonal wetlands, seasonal wetlands swales, and seeps) and other non-wetland waters (i.e., intermittent drainages, drainage ditches, stock ponds, quarry ponds, seasonal creek, and perennial creek) (Figure 4-4). These features are further described in the following sections.

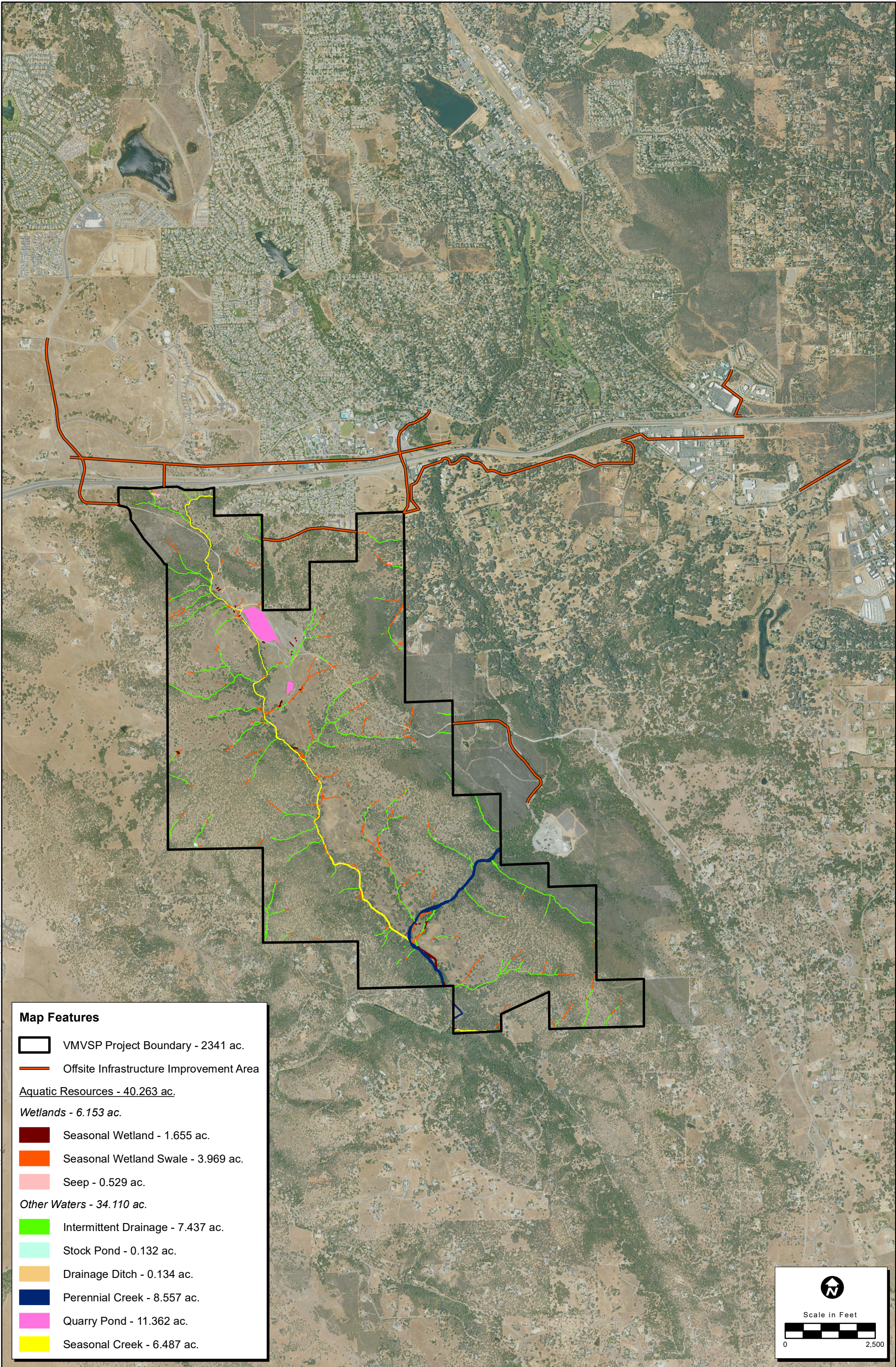
4.4.1 Seasonal Wetland

Seasonal wetlands are ephemeral wet due to the accumulation of surface runoff and rainwater within low-lying areas. Inundation periods tend to be relatively short. These features are commonly dominated by non-native annual and sometimes perennial hydrophytic species. Vegetation within the Study Area's seasonal wetlands is variable. Of the features observed, a drier seasonal wetland has woody riparian vegetation including red willow (*Salix laevigata*), Goodding's black willow (*Salix gooddingii*), Fremont's cottonwood, and Himalayan blackberry (*Rubus armeniacus*) as well as hydrophytic herbaceous species that include annual rabbit-foot grass (*Polypogon monspeliensis*) and pennyroyal (*Mentha pulegium*). A wetter seasonal wetland that is located adjacent to the perennial creek is dominated by broad-leaf cattail (*Typha latifolia*) and includes annual rabbit-foot grass, pennyroyal, white sweetclover (*Melilotus albus*), scarlet monkeyflower (*Erythranthe cardinalis*), and duckweed (*Lemna* sp.).


4.4.2 Seasonal Wetland Swale

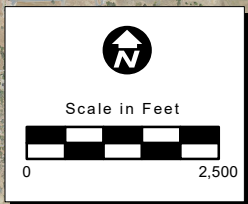
Seasonal wetland swales are linear wetland features that do not exhibit an Ordinary High Water Mark (OHWM). These features are typically inundated for short periods during and immediately after rain events, but may maintain soil saturation for longer periods during the growing season. Vegetation within most mapped seasonal wetland swales is dominated by upland species, including hairy hawkbit (*Leontodon saxatilis*), interwoven navarretia (*Navarretia intertexta*), medusahead grass, and narrow-leaved flax (*Linum bienne*). Lower lying areas, especially in seasonal wetlands swales adjacent to the perennial creek, included patches of Italian ryegrass and other more hydrophytic species such as smartweed (*Persicaria* sp.), tall flatsedge (*Cyperus eragrostis*), mugwort (*Artemisia douglasiana*), and dallis grass (*Paspalum dilatatum*).

Location: N:\2012\2012-020 Marble Valley 2012\MAPS\Wetland_Mapping\Wetland_Delineation\9\1\WV_WDv9_figure_2024.mxd (DW;MAG-mguidry 8/29/2024)



Map Features

-  VMVSP Project Boundary - 2341 ac.
-  Offsite Infrastructure Improvement Area
- Aquatic Resources - 40.263 ac.**
- Wetlands - 6.153 ac.**
-  Seasonal Wetland - 1.655 ac.
-  Seasonal Wetland Swale - 3.969 ac.
-  Seep - 0.529 ac.
- Other Waters - 34.110 ac.**
-  Intermittent Drainage - 7.437 ac.
-  Stock Pond - 0.132 ac.
-  Drainage Ditch - 0.134 ac.
-  Perennial Creek - 8.557 ac.
-  Quarry Pond - 11.362 ac.
-  Seasonal Creek - 6.487 ac.



Map Date: 8/29/2024
Photo Source: NAIP (2022)

Figure 4-4. Aquatic Resources Delineation

4.4.3 Seep

Seeps are usually found on sloped terrain where ground water intersects with the surface. Seeps are characteristically areas with prolonged soil saturation, but may support some surface water depending on the steepness of the slope and topography. The mapped seeps support a dominance of Italian thistle, but also support smaller patches of hydrophytic vegetation that include Baltic rush (*Juncus balticus* ssp. *ater*), iris-leaf rush (*Juncus xiphioides*), and smartweed.

4.4.4 Intermittent Drainage

Intermittent drainages are linear features that exhibit a bed and bank, an OHWM, and flow for weeks or months following significant precipitation events. Intermittent drainages differ from ephemeral drainages in that they flow for longer durations and are influenced by groundwater sources. Groundwater influence usually results in greater quantities and duration of flow relative to ephemeral drainages. The intermittent drainages that are mapped within the Study Area tend to be sparsely vegetated due to the depth and scouring effects of flowing water. Intermittent drainages are found throughout the Study Area and are tributary to large drainageways such as the seasonal and perennial creeks onsite. These intermittent drainages have hydrophytic vegetation in the channel including yellow monkeyflower (*Erythranthe guttata*) and annual rabbit-foot grass, with annual grasses on the banks such as Italian ryegrass, medusahead grass, and soft brome when flowing through more open areas, and sparsely vegetated banks when flowing through woodland.

4.4.5 Drainage Ditch

The drainage ditches that were delineated onsite are linear waterways that were constructed for drainage associated with mining operations. Since mining operations have ceased, several of the ditches still convey surface water and support OHWM field indicators. Plants that are found within the drainage ditches include California buttercup (*Ranunculus californicus*) and cut-leaved geranium (*Geranium dissectum*).

4.4.6 Stock Pond

Two stock ponds were delineated within the Study Area. The stock ponds were constructed along existing drainageways and further enhanced by the placement of an earthen berm to create an impoundment. The stock ponds were delineated based on the presence of an OHWM. Plants found within and along the banks of the stock pond include Carter's buttercup, Mediterranean barley, Italian ryegrass, tall flatsedge, and creeping spikerush.

4.4.7 Quarry Pond

Two historic excavated quarries are located on-site. These quarries have been inundated with water. The larger of these two quarry ponds is fed by a human-made diversion of Marble Creek. The smaller of the two quarry ponds is fed by sheet flow and natural run off. The smaller of the two quarry ponds exhibited an OHWM, as water marks and a shift in vegetation composition were readily observed. The larger quarry pond has a band of woody riparian vegetation along the upper banks that delineates the OHWM. The

larger northern quarry pond is perennial and was edged with patches of woody riparian vegetation and herbaceous hydrophytic vegetation. Goodding's black willow and sandbar willow (*Salix exigua*) were dominant on the banks with scattered Fremont's cottonwood and arroyo willow; creeping spikerush (*Eleocharis macrostachya*), Baltic rush, and annual rabbit-foot grass were dominant along the edge of the water; and pondweed (*Potamogeton* sp.) and water milfoil (*Myriophyllum* sp.) were dominant in the water. The smaller more southern quarry pond is seasonally inundated, but has remnants of hydrophytic vegetation that are dominated by creeping spikerush and annual rabbit-foot grass with scattered Goodding's black willow.

4.4.8 Perennial Creek

Deer Creek flows year around, displays an OHWM, and has a largely unvegetated bed with banks lined by hydrophytic vegetation that includes woody riparian species. The perennial creek within the Study Area supports riparian vegetation that is consistent with the vegetation described for the valley foothill riparian vegetation community. Hydrophytic herbaceous species are dominant in the channel, including broadleaf cattail (*Typha latifolia*), sedges (*Carex* species), rice cutgrass (*Leersia oryzoides*), and duckweed, with Himalayan blackberry, mugwort (*Artemisia douglasiana*), and hairy willow-herb (*Epilobium ciliatum*) predominant on the banks.

4.4.9 Seasonal Creek

The seasonal creek, Marble Creek, is situated on lower gradient slopes, has largely unvegetated beds, exhibits OHWMs, and has a mixture of hydrophytic and facultative plant species along its banks. Marble Creek supports riparian vegetation along most of its length that is consistent with the vegetation that was described for the valley foothill riparian vegetation community. Hydrophytic herbaceous species are dominant in the channel, including broadleaf cattail, least spikerush (*Eleocharis acicularis*), water cress (*Nasturtium officinale*), tall flatsedge (*Cyperus eragrostis*), and narrow-leaf milkweed (*Asclepias fascicularis*).

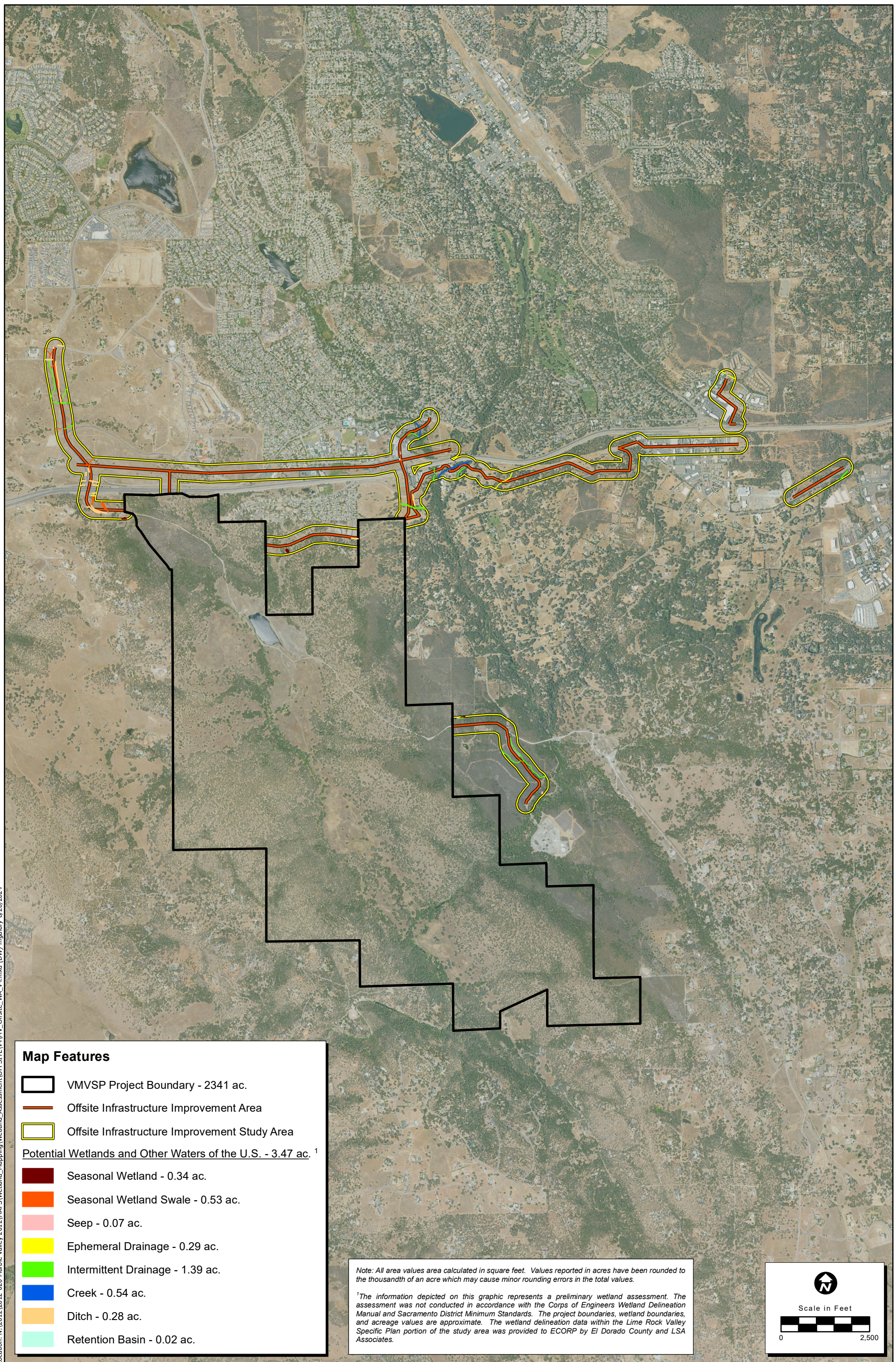
4.4.10 Off-Site Infrastructure Improvement Areas

ECORP biologists performed a preliminary aquatic resources assessment for the offsite infrastructure improvement areas. Aquatic features identified include seasonal wetland, seasonal wetlands swale, seep, ephemeral drainage, intermittent drainage, creek, ditch, and retention basin (Figure 4-5). The aquatic features identified in the Off-Site Infrastructure Improvement Areas are similar, if not of lesser quality and habitat value due to proximity to roads, to aquatic features identified within the VMVSP.












4.4.11 National Wetlands Inventory

ECORP's review of the NWI showed several mapped aquatic features within the Study Area (Figure 4-6). The NWI mapping designation (NWI code) indicates the presence of Freshwater Forested/Shrub Wetland, Freshwater Pond, and Riverine features within the Study Area (USFWS 2024). Note that the NWI inventory mapping is a national dataset based on data prepared from the analysis of high-altitude imagery in conjunction with collateral data sources and field work. A margin of error is inherent in the use of imagery.

Location: N:\2012\2012-020 Marble Valley 2012\MAPS\Wetland_Assessment\OFFSITE\WV_Offsite_WA_v4.mxd (DW)-mgauidry 8/20/2024

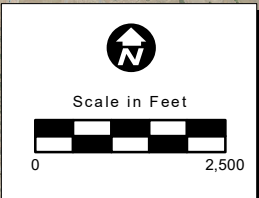


Map Features

-  VMVSP Project Boundary - 2341 ac.
-  Offsite Infrastructure Improvement Area
-  Offsite Infrastructure Improvement Study Area
- Potential Wetlands and Other Waters of the U.S. - 3.47 ac. ¹**
-  Seasonal Wetland - 0.34 ac.
-  Seasonal Wetland Swale - 0.53 ac.
-  Seep - 0.07 ac.
-  Ephemeral Drainage - 0.29 ac.
-  Intermittent Drainage - 1.39 ac.
-  Creek - 0.54 ac.
-  Ditch - 0.28 ac.
-  Retention Basin - 0.02 ac.

Note: All area values area calculated in square feet. Values reported in acres have been rounded to the thousandth of an acre which may cause minor rounding errors in the total values.

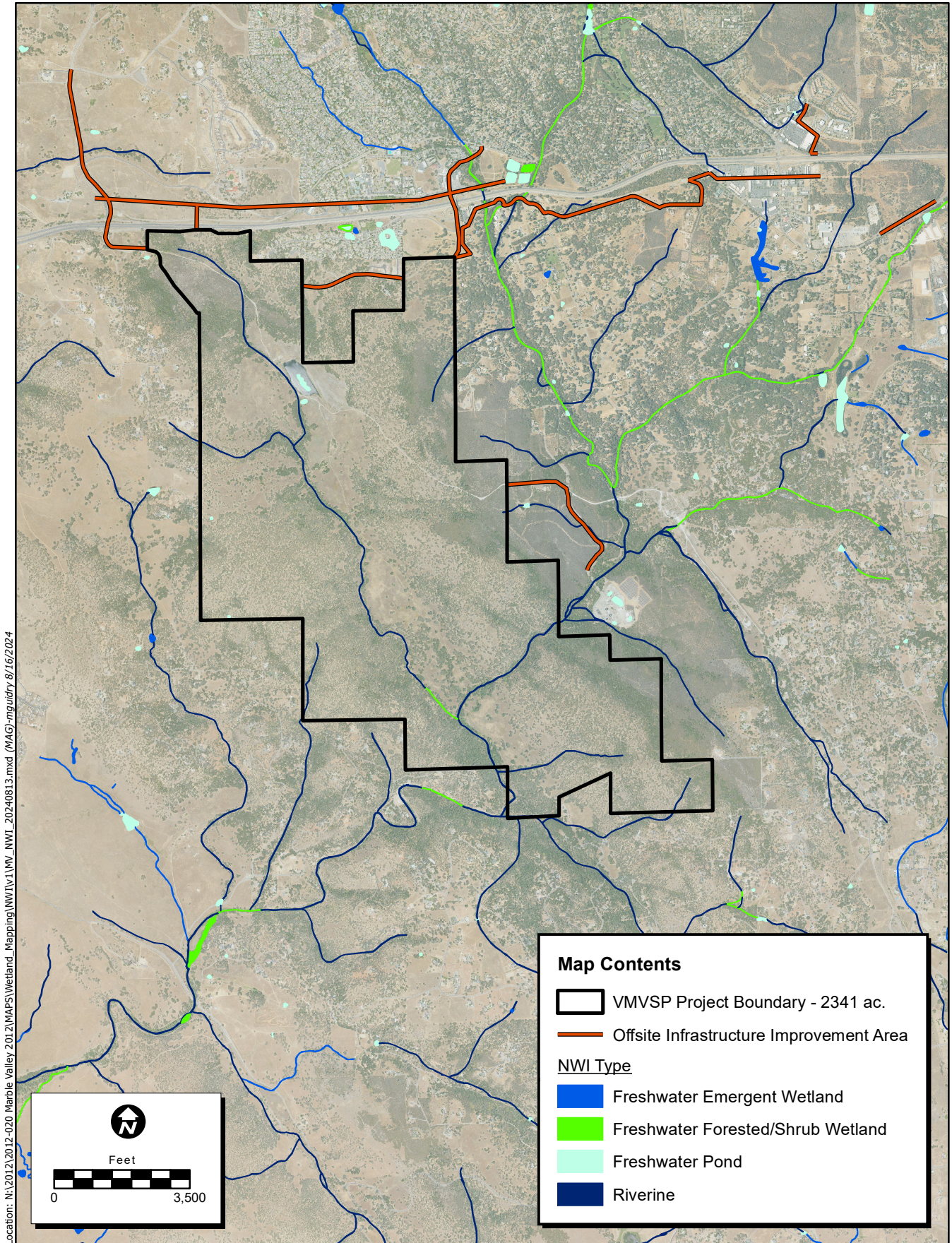
¹The information depicted on this graphic represents a preliminary wetland assessment. The assessment was not conducted in accordance with the Corps of Engineers Wetland Delineation Manual and Sacramento District Minimum Standards. The project boundaries, wetland boundaries, and acreage values are approximate. The wetland delineation data within the Lime Rock Valley Specific Plan portion of the study area was provided to ECORP by El Dorado County and LSA Associates.



Map Date: 8/20/2024
Photo Source: NAIP 2022

DRAFT

Figure 4-5. Preliminary Wetland Assessment



Location: N:\2012\2012-020 Marble Valley 2012\MAPS\Wetland_Mapping\NW1\NW_NWI_20240813.mxd (MAG)-mguidry 8/16/2024

Figure 4-6. National Wetland Inventory
2012-020.01 The Village of Marble Valley Specific Plan

Because the Corps of Engineers for the VMVSP previously performed and verified an aquatic resource delineation, this NWI data is included for informational purposes only. The previous Preliminary Jurisdictional Determination (PJD) has no expiration date. The PJD assumes that all aquatic resources onsite are Waters of the U.S. Under the current post-Sackett Waters of the U.S. definition, some these previously verified waters (e.g., ephemeral waterways, isolated wetlands) could be excluded as Waters of the U.S., but would remain a Water of the State, and regulated under Porter-Cologne.

4.5 Wildlife

Wildlife use and habitat value of the VMVSP is likely relatively high given the restricted private access and undeveloped nature of the site. The annual grassland community provides forage and cover to wildlife such as western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), savannah sparrow (*Passerculus sandwichensis*), Botta's pocket gopher (*Thomomys bottae*), and California vole (*Microtus californicus*). The open grassland communities provide foraging habitat for predators such as red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), and coyote (*Canis latrans*). Wildlife species that are typically found in the blue oak woodland and chaparral communities include western fence lizard, striped racer (*Masticophis lateralis*), mule deer (*Odocoileus hemionus*). The oak woodland provides nesting habitat for acorn woodpecker (*Melanerpes formicivorus*), western bluebird (*Sialia mexicana*), oak titmouse (*Baeolophus inornatus*), and ash-throated flycatcher (*Myiarchus cinerascens*). American black bear (*Ursus americanus*) scat was found within the chaparral community during the August 2024 site reconnaissance. The Deer Creek and Marble Creek riparian corridors likely provide nesting habitat for many birds, including red-shouldered hawk (*Buteo lineatus*), downy woodpecker (*Dryobates pubescens*), Bewick's wren (*Thryomanes bewickii*), and lesser goldfinch (*Spinus psaltria*). A bobcat (*Lynx rufus*) was seen in the Marble Creek riparian corridor. The developed roadways that are found in the offsite infrastructure improvement areas provide minimal, if any, wildlife habitat value.

Appendix D provides a list of wildlife species that ECORP observed in the Study Area during 2024 site reconnaissance surveys.

4.6 Special-Status Species

Table 4-2 presents the list of special-status plant and animal species that ECORP identified through the literature review. For each species, the table provides the listing status, a brief description of habitat requirements and/or species ecology, a determination of the potential to occur within the Study Area, and the rationale for that determination. The potential for each species to occur onsite was assessed using the following criteria:

- **Present** – Species was observed during the site visit or is known to occur within the Study Area based on recent documented occurrences within the CNDDDB or other literature.
- **Potential to Occur** – Suitable habitat (including soils and elevation requirements) occurs in the Study Area, and the species is known or expected to occur in the Project vicinity based on available data sources or professional knowledge/experience.

- **Low Potential to Occur** – Marginal or limited amounts of habitat occur, or the species is not known to occur in the vicinity of the Project based on CNDDDB records and other available information.
- **Presumed Absent** – There is no suitable habitat (including soils and elevation requirements), or the species is not known to occur within the vicinity of the Project based on CNDDDB records and other documentation.

4.6.1 Updates From Previous Surveys

The results of the current assessment are detailed in Table 4-2, and the changes from the previous surveys and deviations from the DEIR, if any, are summarized as follows:

- Special-Status Plants
 - CRPR List 3 and 4 species were not included as target species for the 2013 and 2019 surveys but any incidental occurrences of plants in these categories would have been identified in the observed plant lists in these reports. CRPR List 3 and 4 species have been included in the current list of potentially occurring special-status plants to maintain consistency with the DEIR. The 2013 and 2019 target lists were developed by evaluating the CNDDDB and CNPS species lists for the four 7.5-minute U.S. Geological Survey quadrangles the Project is located (i.e., Clarksville, CA, Folsom SE, CA, Latrobe, CA, and Shingle Springs, CA) and the surrounding twelve quadrangles. The current list of potentially occurring special-status plants was developed by searching these four quadrangles, and also included all the quadrangles surrounding these four, resulting in a 16-quadrangle search.
 - The resultant list of special-status plants analyzed in this report includes several plant species that were not analyzed in the DEIR due to extended quadrangle search or status change. However, the addition of these plants does not change the DEIR special-status plants impact discussion and no additional avoidance or minimization measures are recommended and the impact to special status plant species would remain less than significant with mitigation.
- Special-Status Invertebrates
 - The Crotch bumble bee was determined to be a candidate species for state listing in 2022, after previous field studies were conducted onsite. Consequently, Crotch bumble bee was not included in any target lists for field surveys. It is included in the current assessment. An impact discussion and avoidance and minimization measures for potential effects to Crotch bumble bee were not included in the DEIR but are included in Section 5.1.11 of this report and, with mitigation, the impact to the newly listed Crotch bumble bee would remain less than significant.
 - The monarch butterfly was considered a candidate for federal listing in 2022 and was included in the DEIR, but not prior field studies which were performed onsite before it became a candidate species.. It is included in the current assessment. The DEIR concluded

that effects to monarch butterfly are less than significant, and no avoidance and minimization measures were required.

■ Special-Status Fish

- No changes from the previous studies or the DEIR to the current assessment. The DEIR concluded that there were no effects to special-status fish and no avoidance and minimization measures were required.

■ Special-Status Amphibians and Reptiles

- No changes from the previous studies or the DEIR to the current assessment. The foothill yellow-legged frog was not listed during previous survey efforts but still considered a special-status species and included in targeted surveys during 2012. The subsequent change in status of the foothill yellow-legged frog does not change the impact discussion and avoidance and minimization measures in the DEIR and the determination of less a less than significant impact.

■ Special-Status Birds

- A special-status nesting bird survey was conducted for the Project during the 2012 nesting season. Since this survey, several birds have been identified by USFWS as species of conservation concern that were not considered special-status during the 2012 survey, including Nuttall's woodpecker, yellow-billed magpie, oak titmouse, white-breasted nuthatch, wrenit, California thrasher, Lawrence's goldfinch, and Bullock's oriole. These are included in the current assessment.
- The resultant list of special-status birds analyzed in this report includes several species that were not analyzed in the DEIR. However, the addition of these bird species does not change the DEIR special-status birds impact discussion and no additional avoidance or minimization measures are recommended. With implementation of the mitigation measures in the DEIR, the impacts to these birds would remain less than significant.
- In the DEIR, avoidance and minimization measures were developed for all special-status birds as a group with distinctions for raptors, but no species-specific measures. For this assessment and in response to a request during the comment period, recommended avoidance and minimization measures were developed specifically for potential effects to burrowing owl and were based on CDFW guidelines (see Section 5.1.7 below).

■ Special-Status Mammals

- There have been no substantive changes to special-status mammal listing status since prior studies in the VMVSP, with the exception of the fisher, which is currently a CDFW species of special concern and unlikely to occur onsite. There are no recommended changes to the special-status mammal impact discussions and avoidance and minimization measures in the DEIR.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Plants					
Jepson's onion <i>(Allium jepsonii)</i>	-	-	1B.2	Serpentine or volcanic soils in chaparral, cismontane woodland, and lower montane coniferous forests. Elevation: 985'–4,330' Bloom Period: April–August	Low potential to occur. The serpentine oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Congdon's onion <i>(Allium sanbornii var. congdonii)</i>	-	-	4.3	Chaparral and cismontane woodland with serpentine or volcanic soils. Elevation: 985'–4,575' Bloom Period: April–July	Potential to occur. The serpentine oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Sanborn's onion <i>(Allium sanbornii var. sanbornii)</i>	-	-	4.2	Chaparral, cismontane woodland, and lower montane coniferous forests, usually with gravelly, serpentine soil. Elevation: 855'–4,955' Bloom Period: May–September	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
True's manzanita <i>(Arctostaphylos mewukka ssp. truei)</i>	-	-	4.2	Chaparral and lower montane coniferous forest, sometimes on roadsides. Elevation: 1,395'–4,560' Bloom Period: February–July	Low potential to occur. The oak woodlands and chaparral within the Study Area may provide marginally suitable habitat and this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
lone manzanita <i>(Arctostaphylos myrtifolia)</i>	FT	–	1B.2	Chaparral and cismontane woodlands associated with very acidic, nutrient-poor, coarse soils typical of the lone Formation. Elevation: 195'–1,905' Bloom Period: November–March	Presumed absent. The Study Area does not include lone Formation or similar soils (Wagner et al. 1981).
Nissenan manzanita <i>(Arctostaphylos nissenana)</i>	–	–	1B.2	Rocky soils within closed-cone coniferous forest or chaparral. Elevation: 1,475'–3,610' Bloom Period: February–March	Low potential to occur. The chaparral within the Study Area may provide marginally suitable habitat and this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Big-scale balsamroot <i>(Balsamorhiza macrolepis)</i>	–	–	1B.2	Chaparral, cismontane woodland, and valley and foothill grassland, sometimes on serpentine soils. Elevation: 150'–5,100' Bloom Period: March–June	Potential to occur. The chaparral, oak woodlands, riparian woodlands, and annual grasslands within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Valley brodiaea <i>(Brodiaea rosea ssp. vallicola)</i>	–	–	4.2	Occurs in old alluvial terraces and silt, sandy, or gravelly soils in vernal pools and swales within valley and foothill grassland. Elevation: 35'–1,100' Bloom Period: April–May	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat and this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Brassy bryum (<i>Bryum chryseum</i>)	-	-	4.3	Chaparral openings, cismontane woodland, and valley and foothill grassland. Elevation: 165'–1,970' Bloom Period: N/A	Potential to occur. The chaparral openings, woodlands, and annual grassland may provide suitable habitat.
Brewer's calandrinia (<i>Calandrinia breweri</i>)	-	-	4.2	Burned or disturbed areas, sometimes on loamy or sandy soils, within chaparral and coastal scrub. Elevation: 35' – 4,005' Bloom Period: March-June	Potential to occur. The chaparral may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Spicate calycadenia (<i>Calycadenia spicata</i>)	-	-	1B.3	Adobe, clay, disturbed areas, dry, gravelly, openings, roadsides, and rocky sites within cismontane woodland and valley and foothill grassland. Elevation: 130'–4,595' Bloom Period: May–September	Low potential to occur. The oak woodlands and annual grasslands may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Stebbins' morning-glory (<i>Calystegia stebbinsii</i>)	FE	CE	1B.1	Gabbroic or serpentine soils in chaparral and cismontane woodland. Elevation: 605'–3,575' Bloom Period: April–July	Potential to occur. The chaparral and oak woodlands may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Van Zuur's morning-glory (<i>Calystegia vanzuukiae</i>)	-	-	1B.3	Gabbroic or serpentine soils within chaparral and cismontane woodlands. Elevation: 1,640'–3,870' Bloom Period: May–August	Low potential to occur. The chaparral and oak woodlands may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Sierra arching sedge (<i>Carex cyrtostachya</i>)	-	-	1B.2	Meadows and seeps, marshes and swamps, in mesic areas of lower montane coniferous forest, and margins of riparian forests. Elevation: 2,000'–4,460' Bloom Period: May–August	Presumed absent. The Study Area is significantly lower than the known elevational range for this species.
Chaparral sedge (<i>Carex xerophila</i>)	-	-	1B.2	Serpentine or gabbroic soils within chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 1,445'–2,525' Bloom Period: March–June	Potential to occur. The chaparral and oak woodlands may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Fresno ceanothus (<i>Ceanothus fresnensis</i>)	-	-	4.3	Cismontane woodland openings and lower montane coniferous forests. Elevation: 2,955'–7,250' Bloom Period: May–July	Presumed absent. The Study Area is significantly lower than the known elevational range for this species.
Pine Hill ceanothus (<i>Ceanothus roderickii</i>)	-	-	1B.1	Rocky serpentine or gabbroic soil in chaparral and cismontane woodland. Elevation: 805'–3,575' Bloom Period: April–June	Potential to occur. The chaparral and oak woodlands may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Red Hills soaproot (<i>Chlorogalum grandiflorum</i>)	-	-	1B.2	Serpentine or gabbroic soils in chaparral, cismontane woodland, and lower montane coniferous forest, occasionally on non-ultramafic soils. Elevation: 805'–5,545' Bloom Period: May–June	Potential to occur. The chaparral and oak woodlands may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Brandegee's clarkia (<i>Clarkia biloba</i> ssp. <i>brandegeae</i>)	-	-	4.2	Chaparral, cismontane woodlands, and lower montane coniferous forest often along roadcuts. Elevation: 245'–3,000' Bloom Period: May–July	Present. This species is present in multiple locations in the chaparral and oak woodlands within the Study Area (ECORP 2013a, ECORP 2019a)
Sierra clarkia (<i>Clarkia virgata</i>)	-	-	4.3	Cismontane woodland and lower montane coniferous forest. Elevation: 1,310'–5,300' Bloom Period: May–August	Low potential to occur. The oak woodlands may provide marginally suitable habitat and this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Streambank spring beauty (<i>Claytonia parviflora</i> ssp. <i>grandiflora</i>)	-	-	4.2	Occurs in rocky cismontane woodland. Elevation: 820'–3,935' Bloom Period: February–May	Low potential to occur. The oak woodlands may provide marginally suitable habitat and this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Bisbee Peak rush-rose (<i>Crocانthemum suffrutescens</i>)	-	-	3.2	Often gabbroic or lone soil or in burned or disturbed areas within chaparral. Elevation: 245'–2,200' Bloom Period: April–August	Potential to occur. The chaparral may provide suitable habitat; however, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Ewan's larkspur (<i>Delphinium hansenii</i> ssp. <i>ewanianum</i>)	-	-	4.2	Rocky soils in cismontane woodland, and valley and foothill grassland. Elevation: 195'–1,970' Bloom Period: March–May	Low potential to occur. The oak woodlands and annual grassland may provide marginally suitable habitat; however, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Dwarf downingia (<i>Downingia pusilla</i>)	–	–	2B.2	Mesic areas in valley and foothill grassland, and vernal pools. Species has also been found in disturbed areas such as tire ruts and scraped depressions (CDFW 2024a). Elevation: 5'–1,460' Bloom Period: March–May	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat; however, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
lone buckwheat (<i>Eriogonum apricum</i> var. <i>apricum</i>)	FE	CE	1B.1	Openings in chaparral communities found on lone soils. Elevation: 195'–475' Bloom Period: July–October	Presumed absent. The Study Area does not include lone Formation soils (Wagner et al. 1981).
Irish Hill buckwheat (<i>Eriogonum apricum</i> var. <i>prostratum</i>)	FE	CE	1B.1	Openings in chaparral communities found on lone soils. Elevation: 295'–395' Bloom Period: June–July	Presumed absent. The Study Area does not include lone Formation soils (Wagner et al. 1981).
Tripod buckwheat (<i>Eriogonum tripodum</i>)	–	–	4.2	Often serpentine soils of chaparral and cismontane woodland. Elevation: 655'–5,250' Bloom Period: May–July	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Jepson's woolly sunflower (<i>Eriophyllum jepsonii</i>)	–		4.3	Chaparral, cismontane woodland, and coastal scrub, sometimes on serpentine. Elevation: 655'–3,365' Bloom Period: April–June	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Tuolumne button-celery <i>(Eryngium pinnatisectum)</i>	–	–	1B.2	Vernal pools and other mesic conditions in cismontane woodland and lower montane coniferous forests. Elevation: 230'–3,000' Bloom Period: May–August	Potential to occur. The seasonal wetlands, seasonal wetland swales, and seeps within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Pine Hill flannelbush <i>(Fremontodendron decumbens)</i>	FE	CR	1B.2	Serpentine or gabbro rock outcrops in chaparral and cismontane woodland. Elevation: 1,395'–2,495' Bloom Period: April–July	Low potential to occur. The oak woodlands and chaparral within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Stinkbells <i>(Fritillaria agrestis)</i>	–	–	4.2	Clay and sometimes serpentine soils in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Elevation: 35'–5,100' Bloom Period: March–June	Potential to occur. The oak and riparian woodlands, chaparral, and annual grassland within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
El Dorado bedstraw <i>(Galium californicum ssp. sierrae)</i>	FE	CR	1B.2	Gabbroic soil in chaparral, cismontane woodland and lower montane coniferous forest communities. Elevation: 330'–1,920' Bloom Period: May–June	Low potential to occur. The oak woodlands and chaparral within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Serpentine bluecup <i>(Githopsis pulchella ssp. serpentinicola)</i>	–	–	4.3	Serpentine or lone cismontane woodland. Elevation: 1,050'–2,000' Bloom Period: May–June	Potential to occur. The oak woodlands within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Boggs Lake hedge-hyssop <i>(Gratiola heterosepala)</i>	–	CE	1B.2	Clay substrates of marshes and swamps (lake margins) and vernal pools. Elevation: 35'–7,790' Bloom Period: April–August	Low potential to occur. The seasonal wetlands, seasonal wetland swales, and pond edges within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Hogwallow starfish <i>(Hesperevax caulescens)</i>	–	–	4.2	Mesic areas with clay soil within valley and foothill grassland, shallow vernal pools, and sometimes alkaline areas. Elevation: 0'–1,655' Bloom Period: March–June	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat; however, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Baker cypress (<i>Hesperocyparis bakeri</i>)	-	-	4.2	Serpentine or volcanic substrates of chaparral and lower montane coniferous forest. Elevation: 2,690'-6,545' Bloom Period: N/A	Presumed absent. The Study Area is significantly lower than the known elevational range for this species.
Parry's horkelia (<i>Horkelia parryi</i>)	-	-	1B.2	lone and other soil formations in chaparral and cismontane woodlands. Elevation: 260'-3,510' Bloom Period: April-September	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Coast iris (<i>Iris longipetala</i>)	-	-	4.2	Mesic areas in coastal prairie, lower montane coniferous forest, and meadows and seeps. Elevation: 0'-1,970' Bloom Period: March-May	Presumed absent. The Study Area is outside of the known geographical range for this species.
Foothill jepsonia (<i>Jepsonia heterandra</i>)	-	-	4.3	Rocky, metamorphic soils in cismontane woodland and lower montane coniferous forest. Elevation: 165'-1,640' Bloom Period: August-December	Low potential to occur. The oak woodlands within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Ahart's dwarf rush (<i>Juncus leiospermus</i> var. <i>ahartii</i>)	-	-	1B.2	Mesic areas in valley and foothill grassland. Species has an affinity for slight disturbance such as farmed fields (USFWS 2005). Elevation: 100'-750' Bloom Period: March-May	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Legenere <i>(Legenere limosa)</i>	-	-	1B.1	Various seasonally inundated areas including wetlands, wetland swales, marshes, vernal pools, artificial ponds, and floodplains of intermittent drainages (USFWS 2005). Elevation: 5'-2,885' Bloom Period: April-June	Low potential to occur. The seasonal wetlands, seasonal wetland swales, and pond edges may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Serpentine leptosiphon <i>(Leptosiphon ambiguus)</i>	-	-	4.2	Usually serpentine soils of cismontane woodland, coastal scrub, and valley and foothill grassland. Elevation: 395'-3,710' Bloom Period: March-June	Potential to occur. The oak woodlands and annual grassland within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Humboldt lily <i>(Lilium humboldtii</i> <i>ssp. humboldtii)</i>	-	-	4.2	Occurs in openings within chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 295'-4,200' Bloom Period: May-July	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Sierra monardella <i>(Monardella candicans)</i>	-	-	4.3	Chaparral, cismontane woodland, lower montane coniferous forest; gravelly, sandy microhabitat. Elevation: 490'-2,625' Bloom Period: April-July	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Tehama navarretia (<i>Navarretia heterandra</i>)	-	-	4.3	Mesic areas in valley and foothill grassland and vernal pools. Elevation: 100'–3,315' Bloom Period: April–June	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Pincushion navarretia (<i>Navarretia myersii</i> ssp. <i>myersii</i>)	-	-	1B.1	Often acidic soils in vernal pools. Elevation: 65'–1,085' Bloom Period: April–May	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Slender Orcutt grass (<i>Orcuttia tenuis</i>)	FT	CE	1B.1	Vernal pools, often gravelly. Elevation: 115'–5,775' Bloom Period: May–September	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Sacramento Orcutt grass <i>(Orcuttia viscida)</i>	FE	CE	1B.1	Vernal pools. Elevation: 100'–330' Bloom Period: April–July	Low potential to occur. The seasonal wetlands and seasonal wetland swales may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a) and the study area is significantly lower than the known elevational range for this species.
Layne's ragwort <i>(Packera layneae)</i>	FT	CR	1B.2	Rocky serpentine or gabbroic soil in chaparral and cismontane woodland communities. Elevation: 655'–3,560' Bloom Period: April–August	Potential to occur. The oak woodlands and chaparral within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Sanford's arrowhead <i>(Sagittaria sanfordii)</i>	–	–	1B.2	Shallow marshes and freshwater swamps. Elevation: 0'–2,135' Bloom Period: May–October	Potential to occur. The creeks and pond edges within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Prairie wedge grass <i>(Sphenopholis obtusata)</i>	-	-	2B.2	Meadows and seeps, and mesic areas in cismontane woodland. Elevation: 985'–6,560' Bloom Period: April–July	Low potential to occur. The creeks, seeps, and pond edges within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Hernandez bluecurls <i>(Trichostema rubisepalum)</i>	-	-	4.3	Gravelly volcanic or serpentine soils within broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and vernal pools. Elevation: 985'–4,710' Bloom Period: June–August	Low potential to occur. The oak woodlands and chaparral, and the seasonal wetlands and seasonal wetland swales within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Oval-leaved viburnum <i>(Viburnum ellipticum)</i>	-	-	2B.3	Chaparral, cismontane woodland, and lower montane coniferous forest communities. Elevation: 705'–4,595' Bloom Period: May–June	Low potential to occur. The chaparral within the Study Area may provide marginally suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
El Dorado County mule ears (<i>Wyethia reticulata</i>)	–	–	1B.2	Clay or gabbroic soils in chaparral, cismontane woodland, and lower montane coniferous forest communities. Elevation: 605'–2,065' Bloom Period: April–August	Potential to occur. The chaparral and oak woodlands within the Study Area may provide suitable habitat. However, this species was not observed during prior plant surveys conducted for the Project (ECORP 2013a, ECORP 2019a).
Invertebrates					
Crotch bumble bee (<i>Bombus crotchii</i>)	–	CC	–	Primarily nests underground in open grassland and scrub habitats from the California coast east to the Sierra Cascade and south to Mexico. Survey Period: March-September	Potential to Occur. There is suitable nesting and foraging habitat in the VMVSP and to unimproved offsite infrastructure improvement areas.
Western bumble bee (<i>Bombus occidentalis</i>)	–	CC	–	Meadows and grasslands with abundant floral resources. Primarily nests underground. Largely restricted to high elevation sites in the Sierra Nevada, although rarely detected on the California coast. Survey Period: April-November	Presumed Absent. The VMVSP and the offsite infrastructure improvement areas are not within the current distributional range of this species.
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT	–	–	Vernal pools/wetlands. Survey Period: November–April when surface water is present.	Low Potential to Occur. Not found onsite during 2012-2013 wet- and dry-season surveys within the VMVSP. Marginally suitable habitat may be present in the unimproved offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Monarch (<i>Danaus plexippus</i>)	FC	-	-	Adult monarchs west of the Rocky Mountains typically overwinter in sheltered wooded groves of Monterey pine, Monterey cypress, and gum eucalyptus along coastal California, then disperse in spring throughout California, Nevada, Arizona, and parts of Oregon and Washington. Adults require milkweed and additional nectar sources during the breeding season. Larval caterpillars feed exclusively on milkweed. Survey Period: Any season	Potential to Occur. There are no overwintering or roost sites in the VMVSP and unlikely in the offsite infrastructure improvement areas. However, milkweed plants, host plant for breeding and foraging, are present within the VMVSP and likely in the offsite infrastructure improvement areas.
Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	FT	-	-	Found exclusively on its host plant, the elderberry shrub, in riparian and oak woodland/ oak savannah habitats of California's Central Valley from Shasta to Madera counties.	Presumed Absent. Elderberry shrubs are present in the VMVSP and the unimproved offsite infrastructure improvement areas, but the Study Area is outside the current defined range of this species.
Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	FE	-	-	Vernal pools/wetlands. Survey Period: November-April when surface water is present.	Low Potential to Occur. Not found onsite during 2012-2013 wet- and dry-season surveys within the VMVSP. Marginally suitable habitat may be present in the unimproved offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Fish					
Delta smelt <i>(Hypomesus transpacificus)</i>	FT	CE	–	Sacramento-San Joaquin Delta brackish waters. Survey Period: N/A	Presumed Absent. There is no suitable habitat within the VMVSP and the offsite infrastructure improvement areas, and the Study Area is outside the known range of this species.
Steelhead (CA Central Valley DPS) <i>(Oncorhynchus mykiss irideus)</i>	FT	–	–	Fast-flowing, well-oxygenated rivers and streams below dams in the Sacramento and San Joaquin River systems. Survey Period: N/A	Presumed Absent. There is no suitable habitat within the VMVSP and the offsite infrastructure improvement areas, and the Study Area is outside the known range of this species.
Chinook salmon (Central Valley spring-run ESU) <i>(Oncorhynchus tshawytscha)</i>	FT	CT	–	Undammed rivers, streams, creeks in the Sacramento and San Joaquin River systems. Survey Period: N/A	Presumed Absent. There is no suitable habitat within the VMVSP and the offsite infrastructure improvement areas, and the Study Area is outside the known range of this species.
Amphibians					
California tiger salamander (Central California DPS) <i>(Ambystoma californiense)</i>	FT	CT	WL	Breeds in vernal pools and seasonal wetlands in grassland or oak woodland habitats; adults are terrestrial using underground refuges such as ground squirrel or gopher burrows. Central Valley and Inner Coast Range. Survey Period: Winter-Spring.	Presumed Absent. The VMVSP and the offsite infrastructure improvement areas are outside of the current distributional range of this species.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Western spadefoot (Northern DPS) <i>(Spea hammondi)</i>	FPT	–	SSC	California endemic species of vernal pools, swales, and seasonal wetlands in grassland, scrub and woodland habitats throughout the Central Valley and South Coast Ranges. Prefers open areas with sandy or gravelly soils. Survey Period: Winter-Spring.	Low Potential to Occur. Seasonal wetlands and drainages represent potential aquatic habitat within the VMVSP and the unimproved offsite infrastructure area. However, they were not found during extensive surveys throughout the VMVSP.
California red-legged frog <i>(Rana draytonii)</i>	FT	–	SSC	Lowlands and foothills of the northern and southern Coast Ranges and Sierra Nevada. Found in deep standing or flowing water with dense shrubby or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval development. Adults require aestivation habitat to endure summer dry down. Survey Period: January – Sept.	Low Potential to Occur. Deer and Marble creeks support marginally suitable habitat. Not found during 2012 surveys (ECORP Consulting Inc. 2013c). The nearest CNDDDB occurrence is 24 miles northeast of the Study Area.
Foothill yellow-legged frog East/Southern Sierra Clade <i>(Rana boylei)</i>	FE	CE	SSC	Partly shaded shallow streams and riffles in variety of habitats. Needs cobble-sized substrate for egg-laying and at least 15 weeks of permanent water to attain metamorphosis. Can be active all year in warmer locations; become inactive or hibernate in colder climates. Sierra Nevada from northern limits of South Fork American River watershed to Tehachapi Mountains. Survey Period: May–October.	Low Potential to Occur. Deer and Marble creeks support marginally suitable habitat as they lack essential breeding microhabitat. Not found during extensive 2012 and 2019 surveys (ECORP Consulting Inc. 2019b). There is one extirpated CNDDDB occurrence of this species within five miles of the Study Area.

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Reptiles					
Northwestern pond turtle (<i>Actinemys marmorata</i>)	FPT	–	SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches. Survey Period: April-September	Present. Observed within the VMVSP during 2012 surveys but not during August 2024 site reconnaissance. Likely to occur in Deer Creek within the unimproved offsite infrastructure improvement areas. There are five presumed extant CNDDB occurrences of this species within five miles of the Study Area.
Blainville’s (“Coast”) horned lizard (<i>Phrynosoma blainvillii</i>)	–	–	SSC	Formerly a wide-spread horned lizard found in a wide variety of habitats, often in lower elevation areas with sandy washes and scattered low bushes. Also occurs in Sierra Nevada foothills. Requires open areas for basking, but with bushes or grass clumps for cover, patches of loamy soil or sand for burrowing and an abundance of ants (Stebbins and McGinnis 2012). In the northern Sacramento area, this species appears restricted to the foothills between 1000 to 3000 feet from Cameron Park (El Dorado County) north and west to Grass Valley and Nevada City. Survey Period: April-October	Present. Incidentally observed in chaparral habitat within the VMVSP during 2019 rare plant survey (ECORP field notes) but not observed during August 2024 site reconnaissance. Unimproved offsite infrastructure improvement areas likely support potential habitat for this species. There are four presumed extant CNDDB occurrences of this species within five miles of the Study Area.

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Giant garter snake <i>(Thamnophis gigas)</i>	FT	CT	–	Freshwater ditches, sloughs, and marshes in the Central Valley. Almost extirpated from the southern parts of its range. Survey Period: April-October	Presumed Absent. The VMVSP and the offsite infrastructure improvement areas are not within the current or historic distributional range of this species.
Birds					
Western grebe <i>(Aechmophorus occidentalis)</i>	–	–	BCC	Winters on salt or brackish bays, estuaries, sheltered sea coasts, freshwater lakes, and rivers. Nests on freshwater lakes and marshes with open water bordered by emergent vegetation. Nesting: June-August	Low Potential. Large quarry pond may provide suitable wintering habitat, but there is not nesting habitat in the VMVSP or in the offsite infrastructure improvement areas.
Clark's grebe <i>(Aechmophorus clarkii)</i>	–	–	BCC	Winters on salt or brackish bays, estuaries, sheltered sea coasts, freshwater lakes, and rivers. Breeds on freshwater to brackish marshes, lakes, reservoirs and ponds, with a preference for large stretches of open water fringed with emergent vegetation. Nesting: June-August	Low Potential. Large quarry pond may provide suitable wintering habitat, but there is no nesting habitat in the VMVSP or in the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Black swift (<i>Cypseloides niger</i>)	–	–	BCC, SSC	In California, nests from Cascade-Sierra Nevada region south to Tulare and Mono counties; coastal ranges (Santa Cruz south to San Luis Obispo counties), San Gabriel, San Bernardino, and San Jacinto Mountains. Nests on ledges or shallow caves on steep rock faces, usually behind waterfalls. Winter range, unknown, but thought to be northern and western South America, and West Indies. Nesting: May-September	Presumed Absent. There is no breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.
California black rail (<i>Laterallus jamaicensis coturniculus</i>)	–	CT	CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills (Butte, Yuba, Nevada, Placer, El Dorado counties). Nesting: March-September	Presumed Absent. There is no suitable marsh habitat in the VMVSP or in the offsite infrastructure improvement areas. There is one presumed extant CNDDB occurrence of this species within five miles of the Study Area.
California gull (nesting colony) (<i>Larus californicus</i>)	–	–	BCC, CDFW WL	Nesting occurs in the Great Basin, Great Plains, Mono Lake, and south San Francisco Bay. Breeding colonies located on islands on natural lakes, rivers, or reservoirs. Winters along Pacific Coast from southern British Columbia south to Baja California and Mexico. In California, winters along coast and inland (Central Valley, Salton Sea). Nesting: April-August	Presumed Absent. There is no breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Black tern (<i>Chlidonias niger</i>)	-	-	BCC, SSC	Breeding range includes northeastern California, Central Valley, Great Plains of U.S. and Canada; winters in Central and South America; nesting habitat includes shallow freshwater marsh with emergent vegetation, prairie sloughs, lake margins, river islands, and cultivated rice fields. Nesting: May-August	Presumed Absent. There is no breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.
Double-crested cormorant (<i>Nannopterum auritum</i>)	-	-	CDFW WL	Nests near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines and typically forages in shallow water. Non-nesters are found in many coastal and inland waters. Nesting: April-August	Low Potential to Occur. The large quarry pond in the VMVSP likely supports foraging habitat. There is no suitable breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.
Osprey (<i>Pandion haliaetus</i>)	-	-	CDFW WL	Nesting habitat requires close proximity to accessible fish, open nest site free of mammalian predators, and extended ice-free season. Nest in large trees, snags, cliffs, transmission/communication towers, artificial nest platforms, channel markers/buoys. Nesting: April-September	Low Potential to Occur. The large quarry pond in the VMVSP could support foraging habitat if fish persist. There is no suitable breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
White-tailed kite (<i>Elanus leucurus</i>)	-	-	CFP	Nesting occurs within trees in low elevation grassland, agricultural, wetland, oak woodland, riparian, savannah, and urban habitats. Nesting: March-August	Present. Observed onsite during the 2012 surveys and the August 2024 reconnaissance site visits. There is suitable breeding habitat in the VMVSP and in the offsite infrastructure improvement areas. There are two presumed extant CNDDDB occurrences of this species within five miles of the Study Area.
Golden eagle (<i>Aquila chrysaetos</i>)	-	-	CFP, CDFW WL	Nesting habitat includes mountainous canyon land, rimrock terrain of open desert and grasslands, riparian, oak woodland/savannah, and chaparral. Nesting occurs on cliff ledges, river banks, trees, and human-made structures (e.g., windmills, platforms, and transmission towers). Breeding occurs throughout California, except the immediate coast, Central Valley floor, Salton Sea region, and the Colorado River region, where they can be found during Winter. Nesting: February-August	Potential to Occur. There is suitable breeding habitat in the VMVSP and marginally suitable in the unimproved offsite infrastructure improvement areas. There are two presumed extant CNDDDB occurrences of this species within five miles of the Study Area.
Northern harrier (<i>Circus hudsonius</i>)	-	-	BCC, SSC	Nests on the ground in open wetlands, marshy meadows, wet/lightly grazed pastures, (rarely) freshwater/brackish marshes, tundra, grasslands, prairies, croplands, desert, and shrub-steppe. Nesting: April-September	Presumed Absent. There is no breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Cooper's hawk (<i>Accipiter cooperii</i>)	-	-	CDFW WL	Nests in trees in riparian woodlands, deciduous/mixed and evergreen forests, and urban landscapes (Rosenfield et al. 2020). Nesting: March-July	Present. Observed onsite during the 2012 surveys and August 2024 reconnaissance site visits. There is suitable breeding habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.
American goshawk (<i>Accipiter atricapillus</i>)	-	-	SSC	Nesting occurs in mature to old-growth forests composed primarily of large trees with high canopy closure. In California, nests are built primarily in conifer trees in the Sierra Nevada, Cascade and northwestern coastal Ranges. Nesting: March-August	Presumed Absent. There is no breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Delisted	CE	CFP	Typically nests in forested areas near large bodies of water in the northern half of California; nest in trees and rarely on cliffs; wintering habitat includes forest and woodland communities near water bodies (e.g., rivers, lakes), wetlands, flooded agricultural fields, open grasslands. Nesting: February-September	Low Potential to Occur. The large quarry pond in the VMVSP could support foraging habitat if fish persist. There is no suitable breeding habitat in the VMVSP or in the offsite infrastructure improvement areas. There is one presumed extant CNDDDB occurrence of this species within five miles of the Study Area.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Swainson's hawk (<i>Buteo swainsoni</i>)	-	CT	-	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures. Nesting: March-August	Low Potential to Occur. There is limited foraging habitat, and they are unlikely to nest in the foothill woodland and scrub communities that dominate the VMVSP or in the offsite infrastructure improvement areas. There is one presumed extant CNDDDB occurrence of this species within five miles of the Study Area.
Ferruginous hawk (<i>Buteo regalis</i>)	-	-	BCC, CDFW WL	Rarely breeds in California (Lassen County); winter range includes grassland and shrub-steppe habitats from Northern California (except northeast and northwest corners) south to Mexico and east to Oklahoma, Nebraska, and Texas. Wintering: September-March	Low Potential to Occur. There is limited wintering foraging habitat in the annual grassland in the VMVSP and absent in offsite infrastructure improvement areas.
Western screech-owl (<i>Megascops kennicottii</i>)	-	-	BCC	Nests in tree cavities excavated by woodpeckers, natural cavities in trees, and nest boxes. Breeding habitat includes vegetation communities with deciduous trees, such as riparian, desert, oak and pine-oak woodlands, and urban/suburban parks. Nesting: March-July	Potential to Occur. There is suitable breeding habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Burrowing owl (<i>Athene cunicularia</i>)	–	–	BCC, SSC	Nests in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g., prairie dogs, California ground squirrels). May also use human-landscapes such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds. Nesting: February-August	Potential to Occur. The relatively small patches of annual grassland amongst the oak woodland and scrub communities in the VMVSP represent moderately suitable habitat for this species. There is no suitable habitat in the offsite infrastructure improvement areas. There are three presumed extant CNDDDB occurrences of this species within five miles of the Study Area.
Nuttall's woodpecker (<i>Dryobates nuttallii</i>)	–	–	BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands. Nesting: April-July	Present. Observed onsite during August 2024 reconnaissance site visits. There is suitable breeding habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.
Merlin (<i>Falco columbarius</i>)	–	–	CDFW WL	Breeds in Oregon, Washington north into Canada. Winters in southern Canada to South America, including California. Breeds near forest openings, fragmented woodlots, and riparian areas. Wintering habitat includes wide variety, open forests, grasslands, tidal flats, plains, and urban settings. Wintering in the Central Valley: September-April; does not breed in California.	Potential to Occur. The woodland and grasslands communities onsite represent potential winter foraging habitat in the VMVSP or in the unimproved offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Olive-sided flycatcher (<i>Contopus cooperi</i>)	-	-	SSC, BCC	Nests in montane and northern coniferous forests, in forest openings, forest edges, semiopen forest stands. In California, nests in coastal forests, Cascade and Sierra Nevada region. Winters in Central to South America. Nesting: May-August	Presumed Absent. There is no breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	-	-	SSC	Found throughout California in open country with short vegetation, pastures, old orchards, grasslands, agricultural areas, open woodlands. Not found in heavily forested habitats. Nesting: March-July	Present. Observed during 2012 surveys but not during August 2024 site reconnaissance visits. There is suitable breeding and foraging habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.
Yellow-billed magpie (<i>Pica nuttalli</i>)	-	-	BCC	Endemic to California; found in the Central Valley and coast range south of San Francisco Bay and north of Los Angeles County; nesting habitat includes oak savannah with large in large expanses of open ground; also found in urban parklike settings. Nesting: April-June	Potential to Occur. There is suitable breeding habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.
Oak titmouse (<i>Baeolophus inornatus</i>)	-	-	BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree). Nesting: March-July	Present. Observed onsite during August 2024 reconnaissance site visits. There is suitable breeding habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
White-breasted nuthatch (Slender-billed) <i>(Sitta carolinensis aculeata)</i>	-	-	BCC	Found in deciduous woodland, mixed deciduous and coniferous forest, residential areas. Nests in natural cavities excavated by woodpeckers and nest boxes. Nesting: April-June	Present. Observed onsite during August 2024 reconnaissance site visits. There is suitable breeding habitat in the VMVSP and in the unimproved offsite infrastructure improvement areas.
Bank swallow <i>(Riparia riparia)</i>	-	CT	-	Nests colonially along coasts, rivers, streams, lakes, reservoirs, and wetlands in vertical banks, cliffs, and bluffs in alluvial, friable soils. May also nest in sand, gravel quarries and road cuts. In California, breeding range includes northern and central California. Nesting: May-July	Presumed Absent. There is no suitable breeding habitat in the VMVSP or in the offsite infrastructure improvement areas.
Purple martin <i>(Progne subis)</i>	-	-	SSC	In California, breeds along coast range, Cascade-northern Sierra Nevada region and isolated population in Sacramento. Nesting habitat includes montane forests, Pacific lowlands with dead snags; the isolated Sacramento population nests in weep holes under elevated highways/bridges. Winters in South America. Nesting: May-August	Presumed Absent. This species is not known to nest in the region.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Wrentit (<i>Chamaea fasciata</i>)	-	-	BCC	Coastal sage scrub, northern coastal scrub, chaparral, dense understory of riparian woodlands, riparian scrub, coyote brush and blackberry thickets, and dense thickets in suburban parks and gardens. Nesting: March-August	Present. Observed onsite during August 2024 reconnaissance site visits. There is suitable breeding habitat in the VMVSP but is absent from the offsite infrastructure improvement areas.
California thrasher (<i>Toxostoma redivivum</i>)	-	-	BCC	Resident and endemic to coastal and Sierra Nevada-Cascade foothill areas of California. Nests are usually well hidden in dense shrubs, including scrub oak, California lilac, and chamise. Nesting: February-July	Potential to Occur. There is suitable breeding habitat in the VMVSP and marginally suitable in the unimproved offsite infrastructure improvement areas.
Cassin's finch (<i>Haemorhous cassinii</i>)	-	-	BCC	Breeds throughout the conifer belts of North America's western interior mountains, from central British Columbia to northern New Mexico and Arizona; mostly between 3,000'-10,000' elevation. Often in mature forests of pine, spruce and aspen; especially open, dry pine forests. Some will breed in open sagebrush shrubland with scattered western junipers. Nesting: May-July	Presumed Absent. This species breeds at higher elevations.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Lawrence's goldfinch (<i>Spinus lawrencei</i>)	-	-	BCC	Breeds in Sierra Nevada and inner Coast Range foothills surrounding the Central Valley and the southern Coast Range to Santa Barbara County east through southern California to the Mojave Desert and Colorado Desert into the Peninsular Range. Nests in arid and open woodlands with chaparral or other brushy areas, tall annual weed fields, and a water source (e.g., small stream, pond, lake), and to a lesser extent riparian woodland, coastal scrub, evergreen forests, pinyon-juniper woodland, planted conifers, and ranches or rural residences near weedy fields and water. Nesting: March-September	Potential to Occur. There is suitable breeding habitat in the VMVSP and marginally suitable breeding habitat in the unimproved offsite infrastructure improvement areas.
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	-	-	BCC, SSC	In California, breeding range includes most coastal counties south to Baja California; western Sacramento Valley and western edge of Sierra Nevada region. Nests in moderately open grasslands and prairies with patchy bare ground. Avoids grasslands with extensive shrub cover; more likely to occupy large tracts of habitat than small fragments; removal of grass cover by grazing often detrimental. Nesting: May-August	Presumed Absent. There is no breeding habitat in the VMVSP and the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Belding's savannah sparrow <i>(Passerculus sandwichensis beldingi)</i>	-	CE	BCC	Resident coastally from Point Conception south into Baja California; coastal salt marsh. Year-round resident; nests March-August	Presumed Absent. The VMVSP and offsite infrastructure improvement areas are not within the known range of this species.
Santa Barbara song sparrow <i>(Melospiza melodia graminea)</i>	-	-	BCC	Breeding habitat includes dense shrubs and thickets of giant coreopsis (<i>Coreopsis gigantea</i>), grasslands with scattered shrubs, <i>Artemisia-Opuntia</i> grass associations, and dense grasslands. Resident on California Channel Islands (San Clemente, San Miguel, Santa Cruz, Santa Rosa, Anacapa) and Isla Los Coronados, Baja California. Nesting: February-July	Presumed Absent. The VMVSP and offsite infrastructure improvement areas are not within the known range of this species.
Yellow-breasted Chat <i>(Icteria virens)</i>	-	-	SSC	Early successional riparian habitats with a well-developed shrub layer and an open canopy. Narrow borders of streams, creeks, sloughs, and rivers. Taller trees like cottonwood (<i>Populus</i> sp.) and alder (<i>Alnus</i> sp.) are necessary for song perches. Nesting: March-September	Potential to Occur. Dense riparian thickets along Marble and Deer creeks support suitable breeding habitat in the VMVSP and potentially along Deer Creek in the unimproved offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Tricolored blackbird (<i>Agelaius tricolor</i>)	–	CT	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta counties south to San Bernardino, Riverside and San Diego counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields (Beedy et al. 2020). Nesting: March-August	Low Potential to Occur. There is no suitable breeding habitat in the VMVSP and offsite infrastructure improvement areas. However, the annual grassland in the VMVSP supports potential foraging habitat. There are seven presumed extant CNDDB occurrences of this species within five miles of the Study Area.
Bullock’s oriole (<i>Icterus bullockii</i>)	–	–	BCC	Breeding habitat includes riparian and oak woodlands. Nesting: March-July	Potential to Occur. There is suitable breeding habitat in the VMVSP and unimproved offsite infrastructure improvement areas.
Saltmarsh common yellowthroat (<i>Geothlypis trichas sinuosa</i>)	–	–	BCC, SSC	Breeds in salt marshes of San Francisco Bay; winters San Francisco south along coast to San Diego County. Nesting: March-July	Presumed Absent. The VMVSP and offsite infrastructure improvement areas are not within the known range of this species.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Yellow warbler (<i>Setophaga petechia</i>)	–	–	SSC	Breeding range includes most of California, except Central Valley (isolated breeding locales on Valley floor, Stanislaus, Colusa, and Butte counties), Sierra Nevada range above tree line, and southeastern deserts. Nesting habitat includes riparian vegetation near streams and meadows. Winters in Mexico south to South America. Nesting: May-August	Potential to Occur. Suitable migratory habitat is present in the VMVSP and in the unimproved offsite infrastructure improvement areas and species was observed during 2012 surveys but not during the 2024 site assessment. However, this species does not nest in the region.
Mammals					
Pallid bat (<i>Antrozous pallidus</i>)	–	–	SSC, WBWG- High Priority	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human occupied as well as vacant buildings (Western Bat Working Group [WBWG] 2024). Survey Period: April-September	Present. Suitable roosting and foraging habitat are present in the VMVSP and unimproved offsite infrastructure improvement areas. Detected in multiple habitat types in the VMVSP during 2012 surveys (Wyatt 2013) but not during the 2024 site assessment.

Table 4-2. Potentially Occurring Special-Status Species					
Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Ringtail <i>(Bassariscus astutus)</i>	-	-	CFP	Most often found in riparian corridors in forested, shrubby habitats. Dens in rock outcrops, hollow trees and snags at low to middle elevations. Its range includes the North and South Coast Ranges, Sierra Nevada, Cascades, and the mountainous areas of the Mojave Desert. Survey Period: Any season	Potential to Occur. There is suitable habitat within the VMVSP and in the unimproved offsite infrastructure improvement areas.
Townsend's big-eared bat <i>(Corynorhinus townsendii)</i>	-	-	SSC, WBWG- High Priority	Occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific coast to central Mexico and east into the Great Plains, with isolated populations occurring in the central and eastern United States. It has been reported in a wide variety of habitat types ranging from sea level to 3,300 meters. Habitat associations include: coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Roosting can occur within caves, mines, buildings, rock crevices, trees. Survey Period: April-September	Low Potential to Occur. Preferred roosting areas are not present in the VMVSP or in the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	-	-	WBWG- Medium Priority	Maternity roosts occur in natural hollows and bird-excavated cavities or under loose bark of larger snags. May hibernate in trees, rock crevices, sloughing bark, or in wood piles, mines, caves, or buildings. Prefers forest, north temperate zone conifer and mixed conifer/hardwood forests, but may occur in more xeric habitats in winter and during migration (WBWG 2024 or use current year). Survey Period: April-September	Potential to Occur. Suitable roosting and foraging habitat are present in the VMVSP and unimproved offsite infrastructure improvement areas. Potentially detected during 2012 surveys (Wyatt 2013).
Western red bat (<i>Lasiurus frantzii</i>)	-	-	SSC, WBWG- High Priority	Roosts in foliage of trees or shrubs; Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2024 or use current year). Survey Period: April-September	Present. Suitable roosting and foraging habitat are present in the VMVSP and unimproved offsite infrastructure improvement areas. Detected adjacent to quarry ponds within VMVSP during 2012 surveys (Wyatt 2013) but not observed during August 2024 site reconnaissance visits.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Hoary bat (<i>Lasiurus cinereus</i>)	-	-	WBWG- Medium Priority	Dense foliage of medium to large trees; roost primarily in foliage of both coniferous and deciduous trees; Roosts are usually at the edge of a clearing. Some unusual roosting situations have been reported in caves, beneath a rock ledge, in a woodpecker hole, in a grey squirrel nest, under a driftwood plank, and clinging to the side of a building (WBWG 2024 or use current year). Survey Period: April-September	Present. Suitable roosting and foraging habitat are present in the VMVSP and unimproved offsite infrastructure improvement areas. Detected throughout VMVSP during 2012 surveys (Wyatt 2013) but not during August 2024 site reconnaissance visits.
Small-footed myotis (<i>Myotis ciliolabrum</i>)	-	-	WBWG- High Priority	Roosts in cliff and rock crevices, buildings, concrete overpasses, caves, and mines (WBWG 2024 or use current year). Survey Period: April-September	Present. Suitable roosting and foraging habitat are present in the VMVSP and unimproved offsite infrastructure improvement areas. Detected adjacent to Marble Creek and quarry ponds VMVSP during 2012 surveys (Wyatt 2013) but not during 2024 site reconnaissance visits.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Long-eared myotis (<i>Myotis evotis</i>)	-	-	WBWG- Medium Priority	Occurs in semiarid shrublands, sage, chaparral, and agricultural areas, but is usually associated with coniferous forests. Roosts under exfoliating tree bark, in hollow trees, caves, mines, cliff crevices, sinkholes, and rocky outcrops on the ground; sometimes roost in buildings and under bridges (WBWG 2024 or use current year). Survey Period: April-September	Low Potential to Occur. Preferred roosting areas are not present in the VMVSP or in the unimproved offsite infrastructure improvement areas.
Fringed myotis (<i>Myotis thysanodes</i>)	-	-	WBWG- High Priority	Desert scrub, mesic coniferous forest, grassland, and sage-grass steppe habitats; roosts in crevices in buildings, underground mines, rocks, cliff faces, and bridges; hibernacula include caves, mines and buildings (WBWG 2024 or use current year). Survey Period: April-September	Low Potential to Occur. Preferred roosting areas are not present in the VMVSP or in the unimproved offsite infrastructure improvement areas.
Fisher- Northern California/Southern Oregon DPS (<i>Pekania pennanti</i>)	-	-	SSC	Coastal northern California and includes reintroduced populations in the northern Sierra Nevada and southern Oregon Cascades. Any season	Absent. There is no suitable habitat in the VMVSP or in the offsite infrastructure improvement areas.

Table 4-2. Potentially Occurring Special-Status Species

Common Name (<i>Scientific Name</i>)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
American badger (<i>Taxidea taxus</i>)	–	–	SSC	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Survey Period: Any season	Low Potential to Occur. There is marginally suitable habitat within the VMVSP and in the unimproved offsite infrastructure improvement areas.

Notes: CESA = California Endangered Species Act; CNDDB = California Natural Diversity Database; CNPS = California Native Plant Society; DPS = Distinct Population Segment; ESA = federal Endangered Species Act; ESU = Evolutionary Significant Unit; NPPA = Native Plant Protection Act; VMVSP = Village of Marble Valley Specific Plan; WBWG = Western Bat Working Group

Status Codes

- FE ESA listed, Endangered
- FT ESA listed, Threatened
- FPT Formally Proposed for ESA listing as Threatened
- FC Candidate for ESA listing as Threatened or Endangered
- BCC USFWS Bird of Conservation Concern (USFWS 2021)
- CE CESA- or NPPA-listed, Endangered
- CT CESA- or NPPA-listed, Threatened
- CR CESA- or NPPA-listed, Rare
- CC Candidate for CESA listing as Endangered or Threatened
- CFP California Fish and Game Code Fully Protected Species (§ 3511-birds, § 4700-mammals, §5050-reptiles/amphibians)
- SSC CDFW Species of Special Concern
- CDFW WL CDFW Watch List
- 1B CRPR/Rare or Endangered in California and elsewhere
- 2B CRPR/Plants rare, threatened, or endangered in California but more common elsewhere
- 3 CRPR/Plants About Which More Information is Needed – A Review List
- 4 CRPR/Plants of Limited Distribution – A Watch List
- 0.1 Threat Rank/Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
- 0.2 Threat Rank/Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)
- 0.3 Threat Rank/Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
- Delisted Formally Delisted
- WBWG-High Priority WBWG-species considered highest priority for funding, planning, and conservation actions.
- WBWG-Medium Priority WBWG-species with a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats.

Sources: Beedy et al. 2020; CDFW 2024a; Rosenfield et al. 2020; Stebbins and McGinnis 2012; USFWS 2005; Wagner et al. 1981; WBWG 2024; Wyatt 2013
Plant species information is from the CNPS Rare Plant Inventory (CNPS 2024), unless otherwise cited.

4.7 Critical Habitat or Essential Fish Habitat

There is no designated critical habitat mapped within the Study Area (USFWS 2024).

Based on the literature review, anadromous fish Essential Fish Habitat for Chinook salmon may be present in the "Clarksville, California," "Folsom SE, California," and "Latrobe, California" 7.5-minute quadrangles (NOAA 2022). However, there is no suitable aquatic habitat for Chinook salmon within the VMVSP or the offsite infrastructure improvement areas.

4.8 Wildlife Movement Corridors and Nursery Sites

As discussed in BIO-15 in the DEIR, the Study Area is located within an area that is identified as having moderate permeability to ecological flow or wildlife movement as described in the California Essential Habitat Connectivity Project (Spencer et al. 2010). In addition, according to CDFW's Areas of Conservation Emphasis (ACE) (CDFW 2024b), the Study Area is located in an area with an ACE Rank 3, which are areas with "connections with implementation flexibility" or that have been identified as having connectivity importance, but have not been identified as channelized areas, species corridors, or habitat linkages at this time.

There are no previously documented nursery sites (e.g., deer fawning grounds, waterbird rookeries, or bat maternity roost sites observed), and none were found during previous field surveys onsite. However, the vegetation communities that were found throughout the VMVSP and in undeveloped portions of the offsite infrastructure improvement areas support nesting habitat for many common and special-status birds. A mule deer doe with a fawn was observed in the VMVSP during the August 2024 site reconnaissance survey. The acoustic bat surveys that were performed in 2013 identified several common and special-status bats present onsite, but a roost search was not part of that study (Wyatt 2013). There is a possibility that there are day and/or maternity bat roosts in the VMVSP and undeveloped portions of the Offsite Infrastructure Area.

4.9 Protected Trees/Oak Woodlands

Oak woodland is the most extensive vegetation community within the VMVSP Project Area. Two types of oak woodland were mapped onsite: open-canopy oak woodland, which ranges from 11 percent to 60 percent oak canopy cover, and closed-canopy oak woodland, which has greater than 60 percent oak canopy cover. Another type of oak woodland, interior live oak woodland, occurs in the Marble Valley Parkway connection and Marble Valley Parkway/Cambridge Road offsite improvement areas. These oak woodlands are similar in structure to the blue oak woodland, with an annual grassland understory to an interior live oak overstory. The acreages of the interior live oak woodland in these offsite areas have not been calculated due to access restrictions and associated limitations on tree canopy mapping and road design, but would be subject to the El Dorado County Oak Resources Management Plan and required mitigation.

5.0 IMPACT ASSESSMENT AND RECOMMENDATIONS

The DEIR discusses impacts and mitigation measures in detail. The following section provides additional recommended measures for protected resources. This section specifically addresses questions that were raised by the Biological Resources section of the Environmental Checklist Form in Appendix G of the CEQA Guidelines and analyzed in the DEIR.

5.1 CEQA Checklist Criteria IV(a) – Special-Status Species

Would the Project:

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

5.1.1 Brandegee’s Clarkia or Other Special-Status Plants

In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-5a, and BIO-5b, as identified in the DEIR, would avoid and minimize potential effects to special-status plants.

As stated in the DEIR, compensatory mitigation is not required for Brandegee’s clarkia but may be required for other special-status plant species if they are found during preconstruction surveys. However, DEIR Mitigation Measure BIO-5b does not clearly exclude Brandegee’s clarkia (or any other special-status plants that may be found during preconstruction surveys but for which impacts may not be significant under CEQA) from the requirement for compensatory mitigation if impacts cannot be completely avoided. ECORP has provided suggested revisions to BIO-5b in a memorandum dated September 13, 2024 to provide clarity on the intent of BIO-5b and respond to requests received during the comment period.

Multiple special-status plant species not included in Table 3.3-3 of the DEIR have potential to occur within the Study Area (Table 4-2) based on an extended 16-quadrangle search,. However, the mitigation measures in the DEIR include floristic surveys and avoidance or compensation for significant impacts to special-status plants. Thus, impacts and mitigation measures in the DEIR are sufficient for all special-status plants, including those with potential to occur that were not included in Table 3.3-3 of the DEIR. It should be noted that none of the special plant species included above based on an extended 16-quadrangle search were observed in the multiple prior plant surveys.

5.1.2 Monarch Butterfly

The DEIR explains that potential impacts to monarch butterfly will be less than significant; therefore, it does not recommend avoidance and minimization measures.

5.1.3 California Red-Legged Frog

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-3a, and BIO-7, as identified in the DEIR, would avoid and minimize potential effects to California red-legged frog.

5.1.4 Foothill Yellow-Legged Frog

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-3a, and BIO-8, as identified in the DEIR, would avoid and minimize potential effects to foothill yellow-legged frog.

5.1.5 Northwestern Pond Turtle

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-3a, and BIO-9, as identified in the DEIR, would avoid and minimize potential effects to northwestern pond turtle.

5.1.6 Blainville's Horned Lizard

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-3a, BIO-10a, and 10b, as identified in the DEIR, would avoid and minimize potential effects to Blainville's horned lizard.

5.1.7 Special-Status and Non-Special-Status Nesting Birds

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-11a, and BIO-11b, as identified in the DEIR, would avoid and minimize potential effects to special-status and non-special-status nesting birds.

The following avoidance and minimization measures for potential effects to burrowing owls were not discussed in the DEIR but are recommended in response to a request during the public comment period:

BIO-11c Conduct preconstruction surveys for burrowing owl within Project Area and undisturbed offsite infrastructure improvement areas and compensate for the loss of any burrowing owl habitat.

- A qualified biologist shall conduct take avoidance surveys for burrowing owl in accordance with Appendix D of the Staff Report on Burrowing Owl Mitigation (CDFW 2012).
- If a burrow is confirmed occupied on the site, the buffer in BIO-11b would be implemented and artificial burrow locations shall be appropriately located and their use shall be documented, consistent with Appendix E of the Staff Report on Burrowing Owl Mitigation (CDFW 2012). An exclusion plan shall be developed that includes conducting appropriate scoping to confirm burrows are vacant prior to conducting burrow excavation. Excavation shall be conducted using hand tools with refilling to prevent reoccupation. The excavation plan shall include monitoring of the site to evaluate success and, if needed, the implementation of remedial measures to prevent subsequent owl use.

- If habitat is temporarily disturbed, the applicant will restore the disturbed area to pre-Project condition, including decompacting soil and revegetating. The applicant will mitigate for permanent impacts to nesting, occupied, and satellite burrows and burrowing owl habitat shall be developed in coordination with CDFW, consistent with the Staff Report on Burrowing Owl Mitigation (CDFW 2012), and will include the permanent conservation of habitat (with a corresponding conservation easement and long-term management plan) or purchase of credits from a CDFW-approved species conservation bank, at a minimum of a 1:1 ratio. The County, in consultation with a qualified biologist, shall determine the total acreage of permanent loss of suitable habitat. The County's determination shall be verified and approved by CDFW and/or USFWS, as applicable, and revised, as necessary. Compensation may be in the form of either the purchase of habitat credits from a USFWS- and CDFW-approved conservation bank or the permanent protection (through conservation easement or equivalent protection in perpetuity) and management (including a long-term management plan reviewed and determined adequate to maintain suitable habitat by a qualified biologist) of suitable on- and/or off-site habitat. Evidence of compliance with these compensatory habitat mitigation requirements shall be required prior to land disturbance that would impact special-species habitat. If off-site habitat is preserved, the long-term management plan will be reviewed by the County and incorporated into the tentative map. The Project applicant and the County will ensure implementation of the long-term management plan, including identification of the responsibilities of the entities designated to hold and monitor the easement and to conduct long-term management activities; description of the type, frequency and duration of land management activities; requirements for the required diversity of plant species within the management plan area; requirements for the amount of invasive species allowed within the management plan area; identification of the number of required annual monitoring site visits by the qualified biologist; requirements for infrastructure to minimize trespassing (e.g., fencing, no trespassing signage); monitoring reporting and agency notification requirements; and funding mechanisms and assurances to ensure continued management of plan area.

5.1.8 Roosting Bats

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-12, as identified in the DEIR, would avoid and minimize potential effects to roosting bats.

5.1.9 American Badger

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-13, as identified in the DEIR, would avoid and minimize potential effects to American badger.

5.1.10 Ringtail

The implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-10a, and BIO-14, as identified in the DEIR, would avoid and minimize potential effects to ringtail.

5.1.11 Crotch Bumble Bee

The following impact discussion and avoidance and minimization measures were not discussed in the DEIR but should be included.

5.1.11.1 ***Impact BIO-33: Potential Mortality or Disturbance of Crotch Bumble Bee within VMVSP Project Area (less than significant with mitigation)***

Up to 153.4 acres of annual grassland, 689.6 acres of existing oak woodlands, 138.1 acres of chaparral, and 4.8 acres of riparian woodland habitat, some of which could support Crotch bumble bee overwintering, nesting, and foraging habitat, would be converted to urban uses during Project construction. If Crotch bumble bee is present in the Project Area during construction, clearing and grubbing, excavation, and other construction activities could result in mortality of adults or larvae from being crushed or buried by equipment. Adult Crotch bumble bees could be struck by vehicles and construction equipment traveling along access roads during construction if they are foraging or flying through the area. Construction could also disrupt nesting or foraging activities. Because Crotch bumble bees are a State candidate for listing, this impact would be significant.

As described under Impact BIO-1, the Project applicant would implement general protection measures for biological resources, including Mitigation Measures BIO-1a, BIO-1b, and BIO-1c, which require barriers to protect sensitive Crotch bumble bee habitat as determined by the biological monitor prior to construction, environmental awareness training for construction employees, and periodic site visits during construction. Mitigation Measure BIO-1d avoids and minimizes potential disturbances of oak woodland, Mitigation Measure BIO-2 compensates for the permanent loss of riparian woodland, and Mitigation Measure BIO-33 would minimize impacts to Crotch bumble bee individuals.

BIO-33 Conduct preconstruction surveys and implement Crotch bumble bee avoidance and minimization measures. If the Crotch bumble bee is a Candidate or formally Listed species under the California ESA at the time vegetation- or ground-disturbing activities occur, the following shall apply:

In accordance with the Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species (CDFW 2023), the applicant shall conduct 2 on-site surveys prior to construction of each phase and during the colony active period for Crotch's bumble bee (April-August) when detection probability is the highest and floral resources are in bloom. Space the surveys 2-4 weeks apart to ensure that they cover a range of dates and account for variability in resource use by the candidate species and floral resource phenology within the site. Survey methods and best practices shall follow CDFW guidelines (CDFW 2023).

If Crotch's bumble bees or potential Crotch's bumble bees are observed within the development area, develop a plan to protect Crotch's bumble bee nests and individuals in consultation with CDFW. The plan must include, but not be limited to, the following measures:

- Specifications for construction timing and sequencing requirements (e.g., avoidance of raking, mowing, tilling, or other ground disturbance until late March to protect overwintering queens);
- A requirement for a preconstruction survey to be conducted prior to the start of ground disturbing activities to identify active nests;
- Establishment of no-disturbance buffers for nest sites determined by a qualified biologist as adequate to avoid any disturbance to the nest site or an accidental take and construction monitoring by a qualified biologist to ensure compliance;
- Restrictions associated with construction practices, equipment, or materials that may harm bumble bees as determined by a qualified biologist (e.g., avoidance of pesticides/herbicides, best management practices to minimize the spread of invasive plant species);
- Provisions to avoid Crotch's bumble bees or potential Crotch's bumble bees if observed away from a nest during project activities (i.e., ceasing of project activities until the animal has left the work area of its own volition); and
- Prescription of an appropriate restoration seed mix identified by a qualified biologist that is targeted for the Crotch's bumble bee and the Sierra Nevada foothills, including native plant species known to be visited by native bumble bee species and containing a mix of flowering plant species with continual floral availability through the entire active season of the Crotch's bumble bee (March to October). The seed mix should be applied to temporarily disturbed areas within annual grasslands and oak savanna on the project site.

5.2 CEQA Checklist Criteria IV(b) – Sensitive Natural Communities

Would the Project:

- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

5.2.1 Oak Woodlands/Protect Oak Trees

Avoidance and minimization measures are discussed in detail in the DEIR. In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-1d, and BIO-1e, as identified in the DEIR, would avoid and minimize potential effects to protected oak woodlands and oak trees.

5.2.2 Riparian Woodland

Avoidance and minimization measures are discussed in detail in the DEIR. In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-2, as identified in the DEIR, would avoid and minimize potential effects to protected riparian woodland.

5.2.3 Jurisdictional Wetlands

Avoidance and minimization measures are discussed in detail in the DEIR. In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-3a, and BIO-3b, as identified in the DEIR, would avoid and minimize potential effects to protected jurisdictional wetlands.

5.2.4 Waters of the United States

Avoidance and minimization measures are discussed in detail in the DEIR. In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-3a, and BIO-4, as identified in the DEIR, would avoid and minimize potential effects to protected Waters of the United States.

5.3 CEQA Checklist Criteria IV(c) – Aquatic Resources

Would the Project:

- c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Avoidance and minimization measures are discussed in detail in the DEIR. In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-2, BIO-3a, BIO-3b, and BIO-4, as identified in the DEIR, would avoid and minimize potential effects to aquatic resources.

5.4 CEQA Checklist Criteria IV(d) – Movement Corridors and Nursery Sites

Would the Project:

- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

5.4.1 Resident and Migratory Wildlife

The project was designed to maintain significant open space to provide connectivity for wildlife migration and avoidance and minimization measures are discussed in detail in the DEIR. In addition to VMVSP Project policies, the implementation of Mitigation Measures BIO-1d and BIO-10b, as identified in the DEIR, would avoid and minimize potential effects to resident and migratory wildlife.

5.5 CEQA Checklist Criteria IV(e) – Conflicts with Local Policies or Ordinances

Would the Project:

- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Demonstration of compliance with the oak resources management plan and the tree preservation and replacement plan and measures below will be required in all grading and improvement plans for the Project. Compliance with these construction measures will be monitored by a qualified biologist and reported as indicated in Mitigation Measure BIO-1c of the DEIR.

5.6 CEQA Checklist Criteria IV(f) – Conflicts with Conservation Plans

Would the Project:

- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Project is not subject to the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

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LIST OF APPENDICES

Appendix A – Results of Database Queries

Appendix B – Representative Photographs

Appendix C – Plant Species Observed

Appendix D – Wildlife Species Observed

APPENDIX A










Results of Database Queries








CNPS Rare Plant Inventory












Search Results






54 matches found. Click on scientific name for details

Search Criteria: Quad is one of [3812161:3812068:3812058:3812151:3812172:3812171:3812078:3812077:3812067:3812057:3812047:3812048:3812141:3812142:3812152:3812162]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
<i>Allium jepsonii</i>	Jepson's onion	Alliaceae	perennial bulbiferous herb	Apr-Aug	None	None	G2	S2	1B.2	Yes	1994-01-01	 © 2019 Steven Perry
<i>Allium sanbornii</i> var. <i>congdonii</i>	Congdon's onion	Alliaceae	perennial bulbiferous herb	Apr-Jul	None	None	G4T3	S3	4.3	Yes	1994-01-01	 © 2008 Steven Perry
<i>Allium sanbornii</i> var. <i>sanbornii</i>	Sanborn's onion	Alliaceae	perennial bulbiferous herb	May-Sep	None	None	G4T4?	S3S4	4.2		1994-01-01	 ©2018 Steven Perry
<i>Arctostaphylos mewukka</i> ssp. <i>truei</i>	True's manzanita	Ericaceae	perennial evergreen shrub	Feb-Jul	None	None	G4?T3	S3	4.2	Yes	1984-01-01	 © 2008 George W. Hartwell
<i>Arctostaphylos myrtifolia</i>	lone manzanita	Ericaceae	perennial evergreen shrub	Nov-Mar	FT	None	G1	S1	1B.2	Yes	1974-01-01	 © 2006 Steve Matson
<i>Arctostaphylos nissenana</i>	Nissenan manzanita	Ericaceae	perennial evergreen shrub	Feb-Mar	None	None	G1	S1	1B.2	Yes	1974-01-01	No Photo Available
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	 ©1998 Dean Wm. Taylor
<i>Brodiaea rosea</i> ssp. <i>vallicola</i>	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	Yes	2019-01-07	 © 2011 Steven Perry
<i>Bryum chryseum</i>	brassy bryum	Bryaceae	moss		None	None	G5	S3	4.3		2014-05-05	No Photo Available
<i>Calandrinia breweri</i>	Brewer's calandrinia	Montiaceae	annual herb	(Jan)Mar-Jun	None	None	G4	S4	4.2		1994-01-01	No Photo Available
<i>Calycadenia spicata</i>	spicate calycadenia	Asteraceae	annual herb	May-Sep	None	None	G3?	S3	1B.3		2023-04-05	 © 2023 Christopher Bronny
<i>Calystegia stebbinsi</i>	Stebbins' morning-glory	Convolvulaceae	perennial rhizomatous herb	Apr-Jul	FE	CE	G1	S1	1B.1	Yes	1980-01-01	No Photo Available
<i>Calystegia vanzuukiae</i>	Van Zuuk's morning-glory	Convolvulaceae	perennial rhizomatous herb	May-Aug	None	None	G2Q	S2	1B.3	Yes	2014-07-16	No Photo Available
<i>Carex cyrtostachya</i>	Sierra arching sedge	Cyperaceae	perennial herb	May-Aug	None	None	G2	S2	1B.2	Yes	2015-08-18	No Photo Available
<i>Carex xerophila</i>	chaparral sedge	Cyperaceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	Yes	2016-06-06	 © 2023 Steven Perry

<i>Ceanothus fresnensis</i>	Fresno ceanothus	Rhamnaceae	perennial evergreen shrub	(Apr)May-Jul	None	None	G4	S4	4.3	Yes	1980-01-01	No Photo Available
<i>Ceanothus roderickii</i>	Pine Hill ceanothus	Rhamnaceae	perennial evergreen shrub	Apr-Jun	FE	CR	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	Agavaceae	perennial bulbiferous herb	(Apr)May-Jun	None	None	G3	S3	1B.2	Yes	1974-01-01	No Photo Available
<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	Brandegee's clarkia	Onagraceae	annual herb	(Mar)May-Jul	None	None	G4G5T4	S4	4.2	Yes	2001-01-01	No Photo Available
<i>Clarkia virgata</i>	Sierra clarkia	Onagraceae	annual herb	May-Aug	None	None	G3	S3	4.3	Yes	1974-01-01	No Photo Available
<i>Claytonia parviflora</i> ssp. <i>grandiflora</i>	streambank spring beauty	Montiaceae	annual herb	Feb-May	None	None	G5T3	S3	4.2	Yes	2006-09-29	No Photo Available
<i>Crocanthemum suffrutescens</i>	Bisbee Peak rush-rose	Cistaceae	perennial evergreen shrub	Apr-Aug	None	None	G2?Q	S2?	3.2	Yes	1974-01-01	No Photo Available
<i>Delphinium hansenii</i> ssp. <i>ewanianum</i>	Ewan's larkspur	Ranunculaceae	perennial herb	Mar-May	None	None	G4T3	S3	4.2	Yes	1994-01-01	No Photo Available
<i>Downingia pusilla</i>	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2		1980-01-01	 © 2013 Aaron Arthur
<i>Eriogonum apricum</i> var. <i>apricum</i>	lone buckwheat	Polygonaceae	perennial herb	Jul-Oct	FE	CE	G2T1	S1	1B.1	Yes	1974-01-01	No Photo Available
<i>Eriogonum apricum</i> var. <i>prostratum</i>	Irish Hill buckwheat	Polygonaceae	perennial herb	Jun-Jul	FE	CE	G2T1	S1	1B.1	Yes	1974-01-01	No Photo Available
<i>Eriogonum tripodum</i>	tripod buckwheat	Polygonaceae	perennial deciduous shrub	May-Jul	None	None	G4	S4	4.2	Yes	1974-01-01	 ©2008 Steven Perry
<i>Eriophyllum jepsonii</i>	Jepson's woolly sunflower	Asteraceae	perennial herb	Apr-Jun	None	None	G3	S3	4.3	Yes	1974-01-01	No Photo Available
<i>Eryngium pinnatisectum</i>	Tuolumne button-celery	Apiaceae	annual/perennial herb	May-Aug	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2007 Robert E. Preston, Ph.D.
<i>Fremontodendron decumbens</i>	Pine Hill flannelbush	Malvaceae	perennial evergreen shrub	Apr-Jul	FE	CR	G1	S1	1B.2	Yes	1974-01-01	No Photo Available
<i>Fritillaria agrestis</i>	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	G3	S3	4.2	Yes	1980-01-01	 © 2016 Aaron Schusteff
<i>Galium californicum</i> ssp. <i>sierrae</i>	El Dorado bedstraw	Rubiaceae	perennial herb	May-Jun	FE	CR	G5T1	S1	1B.2	Yes	1974-01-01	 © 2019 John Doyen
<i>Githopsis pulchella</i> ssp. <i>serpenticola</i>	serpentine bluecup	Campanulaceae	annual herb	May-Jun	None	None	G4T3	S3	4.3	Yes	2001-01-01	 © 2019 Barry Breckling
<i>Gratiola heterosepala</i>	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2		1974-01-01	 ©2004 Carol W. Witham

<i>Hespererax caulescens</i>	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	Yes	2001-01-01	 © 2017 John Doyen
<i>Hesperocyparis bakeri</i>	Baker cypress	Cupressaceae	perennial evergreen tree		None	None	G3	S3	4.2		1974-01-01	 © 2021 Scot Loring
<i>Horkelia parryi</i>	Parry's horkelia	Rosaceae	perennial herb	Apr-Sep	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2009 Barry Breckling
<i>Iris longipetala</i>	coast iris	Iridaceae	perennial rhizomatous herb	Mar-May(Jun)	None	None	G3	S3	4.2	Yes	2006-10-12	 © 2014 Aaron Schusteff
<i>Jepsonia heterandra</i>	foothill jepsonia	Saxifragaceae	perennial herb	Aug-Dec	None	None	G3	S3	4.3	Yes	1994-01-01	 © 2014 Belinda Lo
<i>Juncus leiospermus</i> var. <i>ahartii</i>	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	None	None	G2T1	S1	1B.2	Yes	1984-01-01	 © 2004 Carol W. Witham
<i>Legenere limosa</i>	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	Yes	1974-01-01	 © 2000 John Game
<i>Leptosiphon ambiguus</i>	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2010 Aaron Schusteff
<i>Lilium humboldtii</i> ssp. <i>humboldtii</i>	Humboldt lily	Liliaceae	perennial bulbiferous herb	May-Jul(Aug)	None	None	G4T3	S3	4.2	Yes	1994-01-01	 © 2008 Sierra Pacific Industries
<i>Monardella candicans</i>	Sierra monardella	Lamiaceae	annual herb	Apr-Jul	None	None	G4	S4	4.3	Yes	1994-01-01	 © 2011 Jean Pawek
<i>Navaretia heterandra</i>	Tehama navaretia	Polemoniaceae	annual herb	Apr-Jun	None	None	G4	S4	4.3		1974-01-01	 © 2021 Scot Loring

<i>Navarretia myersii</i> ssp. <i>myersii</i>	pincushion navarretia	Polemoniaceae	annual herb	Apr-May	None	None	G2T2	S2	1B.1	Yes	1994-01-01		© 2020 Leigh Johnson
<i>Orcuttia tenuis</i>	slender Orcutt grass	Poaceae	annual herb	May-Sep(Oct)	FT	CE	G2	S2	1B.1	Yes	1974-01-01		© 2013 Justy Leppert
<i>Orcuttia viscidula</i>	Sacramento Orcutt grass	Poaceae	annual herb	Apr-Jul(Sep)	FE	CE	G1	S1	1B.1	Yes	1974-01-01		© Rick York and CNPS
<i>Packera layneae</i>	Layne's ragwort	Asteraceae	perennial herb	Apr-Aug	FT	CR	G2	S2	1B.2	Yes	1974-01-01	No Photo Available	
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	Yes	1984-01-01		©2013 Debra L. Cook
<i>Sphenopholis obtusata</i>	prairie wedge grass	Poaceae	perennial herb	Apr-Jul	None	None	G5	S2	2B.2		1974-01-01	No Photo Available	
<i>Trichostema rubisepalum</i>	Hernandez bluecurls	Lamiaceae	annual herb	Jun-Aug	None	None	G4	S4	4.3	Yes	1974-01-01	No Photo Available	
<i>Viburnum ellipticum</i>	oval-leaved viburnum	Viburnaceae	perennial deciduous shrub	May-Jun	None	None	G4G5	S3	2B.3		1974-01-01		© 2006 Tom Engstrom
<i>Wyethia reticulata</i>	El Dorado County mule ears	Asteraceae	perennial herb	Apr-Aug	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available	

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Suggested Citation:

California Native Plant Society, Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). Website <https://www.rareplants.cnps.org> [accessed 26 July 2024].



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad (Clarksville (3812161) OR Shingle Springs (3812068) OR Latrobe (3812058) OR Folsom SE (3812151) OR Rocklin (3812172) OR Pilot Hill (3812171) OR Coloma (3812078) OR Garden Valley (3812077) OR Placerville (3812067) OR Fiddletown (3812057) OR Amador City (3812047) OR Irish Hill (3812048) OR Carbondale (3812141) OR Sloughhouse (3812142) OR Buffalo Creek (3812152) OR Folsom (3812162))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAA01181	<i>Ambystoma californiense pop. 1</i> California tiger salamander - central California DPS	Threatened	Threatened	G2G3T3	S3	WL
AAABF02020	<i>Spea hammondi</i> western spadefoot	Proposed Threatened	None	G2G3	S3S4	SSC
AAABH01022	<i>Rana draytonii</i> California red-legged frog	Threatened	None	G2G3	S2S3	SSC
AAABH01055	<i>Rana boylei pop. 5</i> foothill yellow-legged frog - south Sierra DPS	Endangered	Endangered	G3T2	S2	
ABNFD01020	<i>Nannopterum auritum</i> double-crested cormorant	None	None	G5	S4	WL
ABNGA04010	<i>Ardea herodias</i> great blue heron	None	None	G5	S4	
ABNGA04040	<i>Ardea alba</i> great egret	None	None	G5	S4	
ABNKC01010	<i>Pandion haliaetus</i> osprey	None	None	G5	S4	WL
ABNKC06010	<i>Elanus leucurus</i> white-tailed kite	None	None	G5	S3S4	FP
ABNKC10010	<i>Haliaeetus leucocephalus</i> bald eagle	Delisted	Endangered	G5	S3	FP
ABNKC12040	<i>Accipiter cooperii</i> Cooper's hawk	None	None	G5	S4	WL
ABNKC12061	<i>Accipiter atricapillus</i> American goshawk	None	None	G5	S3	SSC
ABNKC19070	<i>Buteo swainsoni</i> Swainson's hawk	None	Threatened	G5	S4	
ABNKC19120	<i>Buteo regalis</i> ferruginous hawk	None	None	G4	S3S4	WL
ABNKC22010	<i>Aquila chrysaetos</i> golden eagle	None	None	G5	S3	FP
ABNKD06030	<i>Falco columbarius</i> merlin	None	None	G5	S3S4	WL
ABNME03041	<i>Laterallus jamaicensis coturniculus</i> California black rail	None	Threatened	G3T1	S2	FP
ABNSB10010	<i>Athene cunicularia</i> burrowing owl	None	None	G4	S2	SSC



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ABPAU01010	<i>Progne subis</i> purple martin	None	None	G5	S3	SSC
ABPAU08010	<i>Riparia riparia</i> bank swallow	None	Threatened	G5	S3	
ABPBXA0020	<i>Ammodramus savannarum</i> grasshopper sparrow	None	None	G5	S3	SSC
ABPBXB0020	<i>Agelaius tricolor</i> tricolored blackbird	None	Threatened	G1G2	S2	SSC
AFCHA0209K	<i>Oncorhynchus mykiss irideus pop. 11</i> steelhead - Central Valley DPS	Threatened	None	G5T2Q	S2	SSC
AMACC01020	<i>Myotis yumanensis</i> Yuma myotis	None	None	G5	S4	
AMACC02010	<i>Lasionycteris noctivagans</i> silver-haired bat	None	None	G3G4	S3S4	
AMACC10010	<i>Antrozous pallidus</i> pallid bat	None	None	G4	S3	SSC
AMAFJ01010	<i>Erethizon dorsatum</i> North American porcupine	None	None	G5	S3	
AMAJF01020	<i>Pekania pennanti</i> Fisher	None	None	G5	S2S3	SSC
AMAJF04010	<i>Taxidea taxus</i> American badger	None	None	G5	S3	SSC
ARAAD02031	<i>Actinemys marmorata</i> northwestern pond turtle	Proposed Threatened	None	G2	SNR	SSC
ARACF12100	<i>Phrynosoma blainvillii</i> coast horned lizard	None	None	G4	S4	SSC
ARADB36150	<i>Thamnophis gigas</i> giant gartersnake	Threatened	Threatened	G2	S2	
CARA2443CA	Central Valley Drainage Hardhead/Squawfish Stream Central Valley Drainage Hardhead/Squawfish Stream	None	None	GNR	SNR	
CTT37D00CA	lone Chaparral lone Chaparral	None	None	G1	S1.1	
CTT42110CA	Valley Needlegrass Grassland Valley Needlegrass Grassland	None	None	G3	S3.1	
CTT44110CA	Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	None	None	G3	S3.1	
CTT44132CA	Northern Volcanic Mud Flow Vernal Pool Northern Volcanic Mud Flow Vernal Pool	None	None	G1	S1.1	
ICBRA03030	<i>Branchinecta lynchi</i> vernal pool fairy shrimp	Threatened	None	G3	S3	
ICBRA03150	<i>Branchinecta mesovallensis</i> midvalley fairy shrimp	None	None	G2	S2S3	



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ICBRA06010	<i>Linderiella occidentalis</i> California linderiella	None	None	G2G3	S2S3	
ICBRA10010	<i>Lepidurus packardii</i> vernal pool tadpole shrimp	Endangered	None	G3	S3	
ICBRA23010	<i>Dumontia oregonensis</i> hairy water flea	None	None	G1G3	S1	
IICOL48011	<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	Threatened	None	G3T3	S3	
IICOL58010	<i>Atractelmis wawona</i> Wawona riffle beetle	None	None	G3	S1S2	
IICOL5V010	<i>Hydrochara rickseckeri</i> Ricksecker's water scavenger beetle	None	None	G2?	S2?	
IIHYM24252	<i>Bombus occidentalis</i> western bumble bee	None	Candidate Endangered	G3	S1	
IIHYM24260	<i>Bombus pensylvanicus</i> American bumble bee	None	None	G3G4	S2	
IIHYM24480	<i>Bombus crotchii</i> Crotch's bumble bee	None	Candidate Endangered	G2	S2	
IIHYM35030	<i>Andrena blennospermatis</i> Blennosperma vernal pool andrenid bee	None	None	G2	S1	
IIHYM72010	<i>Chrysis tularensis</i> Tulare cuckoo wasp	None	None	G1G2	S2	
IIPLE23020	<i>Cosumnoperla hypocreana</i> Cosumnes stripetail	None	None	G2	S2	
ILARA14020	<i>Banksula californica</i> Alabaster Cave harvestman	None	None	GH	SH	
PDAP10Z0P0	<i>Eryngium pinnatisectum</i> Tuolumne button-celery	None	None	G2	S2	1B.2
PDAST11061	<i>Balsamorhiza macrolepis</i> big-scale balsamroot	None	None	G2	S2	1B.2
PDAST1P090	<i>Calycadenia spicata</i> spicate calycadenia	None	None	G3?	S3	1B.3
PDAST8H1V0	<i>Packera layneae</i> Layne's ragwort	Threatened	Rare	G2	S2	1B.2
PDAST9X0D0	<i>Wyethia reticulata</i> El Dorado County mule ears	None	None	G2	S2	1B.2
PDCAM060C0	<i>Downingia pusilla</i> dwarf downingia	None	None	GU	S2	2B.2
PDCAM0C010	<i>Legenere limosa</i> legenere	None	None	G2	S2	1B.1
PDCIS020F0	<i>Crocantemum suffrutescens</i> Bisbee Peak rush-rose	None	None	G2?Q	S2?	3.2



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PDCON040H0	<i>Calystegia stebbinsii</i> Stebbins' morning-glory	Endangered	Endangered	G1	S1	1B.1
PDCON040Q0	<i>Calystegia vanzuukiae</i> Van Zuur's morning-glory	None	None	G2Q	S2	1B.3
PDCPR07080	<i>Viburnum ellipticum</i> oval-leaved viburnum	None	None	G4G5	S3	2B.3
PDERI040V0	<i>Arctostaphylos nissenana</i> Nissenan manzanita	None	None	G1	S1	1B.2
PDERI04240	<i>Arctostaphylos myrtifolia</i> lone manzanita	Threatened	None	G1	S1	1B.2
PDONA05053	<i>Clarkia biloba ssp. brandegeae</i> Brandegee's clarkia	None	None	G4G5T4	S4	4.2
PDPGN080F1	<i>Eriogonum apricum var. apricum</i> lone buckwheat	Endangered	Endangered	G2T1	S1	1B.1
PDPGN080F2	<i>Eriogonum apricum var. prostratum</i> Irish Hill buckwheat	Endangered	Endangered	G2T1	S1	1B.1
PDPLM0C0X1	<i>Navarretia myersii ssp. myersii</i> pincushion navarretia	None	None	G2T2	S2	1B.1
PDRHA04190	<i>Ceanothus roderickii</i> Pine Hill ceanothus	Endangered	Rare	G1	S1	1B.1
PDROS0W0C0	<i>Horkelia parryi</i> Parry's horkelia	None	None	G2	S2	1B.2
PDRUB0N0E7	<i>Galium californicum ssp. sierrae</i> El Dorado bedstraw	Endangered	Rare	G5T1	S1	1B.2
PDSCR0R060	<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	None	Endangered	G2	S2	1B.2
PDSTE03030	<i>Fremontodendron decumbens</i> Pine Hill flannelbush	Endangered	Rare	G1	S1	1B.2
PMALI040Q0	<i>Sagittaria sanfordii</i> Sanford's arrowhead	None	None	G3	S3	1B.2
PMCYP03M00	<i>Carex cyrtostachya</i> Sierra arching sedge	None	None	G2	S2	1B.2
PMCYP03M60	<i>Carex xerophila</i> chaparral sedge	None	None	G2	S2	1B.2
PMJUN011L1	<i>Juncus leiospermus var. ahartii</i> Ahart's dwarf rush	None	None	G2T1	S1	1B.2
PMLIL022V0	<i>Allium jepsonii</i> Jepson's onion	None	None	G2	S2	1B.2
PMLIL0G020	<i>Chlorogalum grandiflorum</i> Red Hills soaproot	None	None	G3	S3	1B.2
PMPOA4G050	<i>Orcuttia tenuis</i> slender Orcutt grass	Threatened	Endangered	G2	S2	1B.1



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PMPOA4G070	<i>Orcuttia viscida</i> Sacramento Orcutt grass	Endangered	Endangered	G1	S1	1B.1
PMPOA5T030	<i>Sphenopholis obtusata</i> prairie wedge grass	None	None	G5	S2	2B.2

Record Count: 83

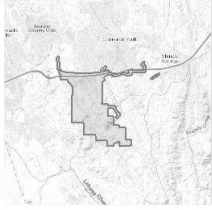
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

El Dorado County, California



Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📍 (916) 414-6713

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act requires Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are not shown on this list. Please contact [NOAA Fisheries](#) for species under their jurisdiction.

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Reptiles

NAME	STATUS
Northwestern Pond Turtle <i>Actinemys marmorata</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened
Foothill Yellow-legged Frog <i>Rana boylei</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5133	Endangered
Western Spadefoot <i>Spea hammondi</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
El Dorado Bedstraw <i>Galium californicum ssp. sierrae</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5209	Endangered
Layne's Butterweed <i>Senecio layneae</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4062	Threatened
Pine Hill Ceanothus <i>Ceanothus roderickii</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3293	Endangered
Pine Hill Flannelbush <i>Fremontodendron californicum ssp. decumbens</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4818	Endangered

Stebbins' Morning-glory *Calystegia stebbinsi*
Wherever found
No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/3991>

Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act¹ and the Migratory Bird Treaty Act².

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats³, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the ["Supplemental Information on Migratory Birds and Eagles"](#).

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

- The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
- To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

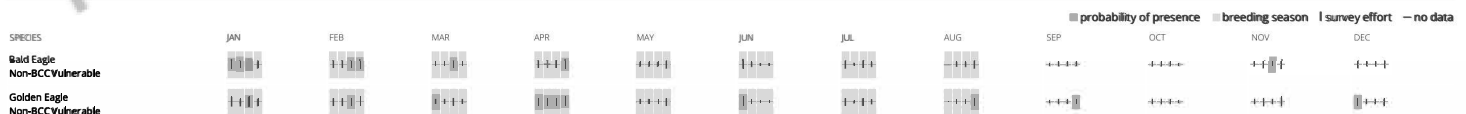
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the ["Supplemental Information on Migratory Birds and Eagles"](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the [FAQ below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the [PROBABILITY OF PRESENCE SUMMARY](#) below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Belding's Savannah Sparrow <i>Passerculus sandwichensis beldingi</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Black Swift <i>Cypseloides niger</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Black Tern <i>Chlidonias niger surinamensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Bullock's Oriole <i>Icterus bullockii</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 21 to Jul 25
California Gull <i>Larus californicus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
California Thrasher <i>Toxostoma redivivum</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Cassin's Finch <i>Haemorhous cassinii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Clark's Grebe <i>Aechmophorus clarkii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Common Yellowthroat <i>Geothlypis trichas sinuosa</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch <i>Spinus lawrencei</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Northern Harrier <i>Circus hudsonius</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Nuttall's Woodpecker <i>Dryobates nuttalli</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20
Oak Titmouse <i>Baeolophus inornatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Olive-sided Flycatcher <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Santa Barbara Song Sparrow <i>Melospiza melodia graminea</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5513	Breeds Mar 1 to Sep 5
Tricolored Blackbird <i>Agelaius tricolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Western Grebe <i>aechmophorus occidentalis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Western Screech-owl <i>Megascops kennicottii cardonensis</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Jun 30
Wrentit <i>Chamaea fasciata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10
Yellow-billed Magpie <i>Pica nuttalli</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9726	Breeds Apr 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

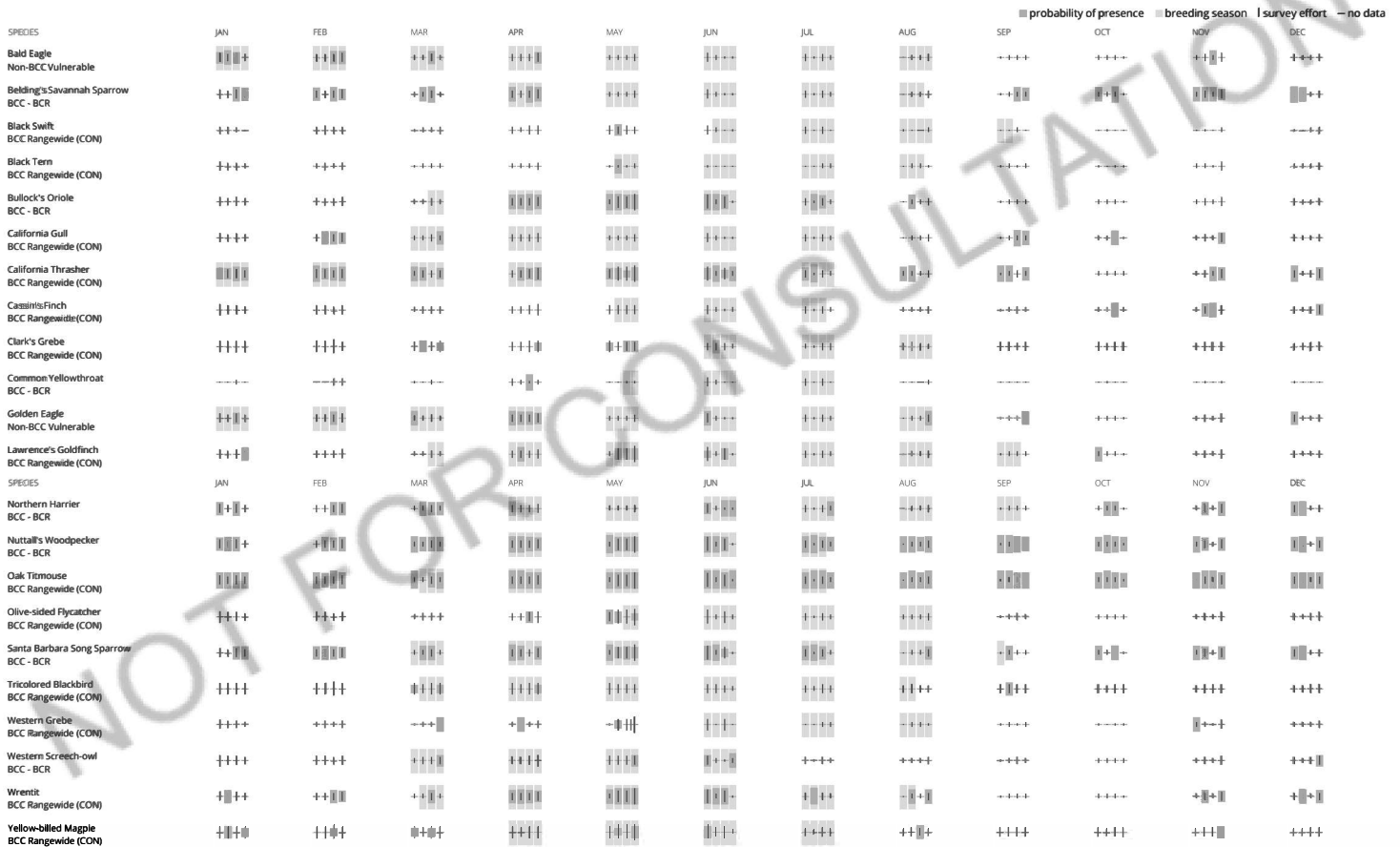
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. **Additional measures or permits** may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the **Avian Knowledge Network (AKN)**. The AKN data is based on a growing collection of **survey, banding, and citizen science datasets** and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the **Rapid Avian Information Locator (RAIL Tool)**.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the **Avian Knowledge Network (AKN)**. This data is derived from a growing collection of **survey, banding, and citizen science datasets**.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the **RAIL Tool** and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northwest Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the panorag studies or contact Caleb Soilegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the Individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESH-WATER EMERGENT WETLAND

PEM1Ax

FRESH-WATER FORESTED/SHRUB WETLAND

PFQC

PFQA

PSSC

PFOAx

FRESH-WATER POND

PUBHx

PUBFx

PABKx

PUBFh

RIVERINE

R4SBC

R3UBH

R4SBA

R5UBE

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does not replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercled worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Quad Name **Clarksville**

Quad Number **38121-F1**

1.0 ESA Anadromous Fish

SONCC Coho ESU (T) -

CCC Coho ESU (E) -

CC Chinook Salmon ESU (T) -

CVSR Chinook Salmon ESU (T) - **X**

SRWR Chinook Salmon ESU (E) -

NC Steelhead DPS (T) -

CCC Steelhead DPS (T) -

SCCC Steelhead DPS (T) -

SC Steelhead DPS (E) -

CCV Steelhead DPS (T) - **X**

Eulachon (T) -

sDPS Green Sturgeon (T) -

2.0 ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -

CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -

CVSR Chinook Salmon Critical Habitat -

SRWR Chinook Salmon Critical Habitat -

NC Steelhead Critical Habitat -

CCC Steelhead Critical Habitat -

SCCC Steelhead Critical Habitat -

SC Steelhead Critical Habitat -

CCV Steelhead Critical Habitat -

Eulachon Critical Habitat -

sDPS Green Sturgeon Critical Habitat -

3.0 ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

4.0 ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

5.0 ESA Sea Turtles

East Pacific Green Sea Turtle (T) -

Olive Ridley Sea Turtle (T/E) -

Leatherback Sea Turtle (E) -

North Pacific Loggerhead Sea Turtle (E) -

6.0 ESA Whales

Blue Whale (E) -

Fin Whale (E) -

Humpback Whale (E) -

Southern Resident Killer Whale (E) -

North Pacific Right Whale (E) -

Sei Whale (E) -

Sperm Whale (E) -

7.0 **ESA Pinnipeds**

Guadalupe Fur Seal (T) -

8.0 **Essential Fish Habitat**

Coho EFH -

Chinook Salmon EFH - **X**

Groundfish EFH -

Coastal Pelagics EFH -

Highly Migratory Species EFH -

9.0 **MMPA Species**

10.0 **ESA and MMPA Cetaceans/Pinnipeds**
See list at left and consult Monica DeAngelis
monica.deangelis@noaa.gov
562-980-3232

MMPA Cetaceans -

MMPA Pinnipeds -

Quad Name **Folsom SE**

Quad Number **38121-E1**

11.0 ESA Anadromous Fish

SONCC Coho ESU (T) -

CCC Coho ESU (E) -

CC Chinook Salmon ESU (T) -

CVSR Chinook Salmon ESU (T) - **X**

SRWR Chinook Salmon ESU (E) -

NC Steelhead DPS (T) -

CCC Steelhead DPS (T) -

SCCC Steelhead DPS (T) -

SC Steelhead DPS (E) -

CCV Steelhead DPS (T) - **X**

Eulachon (T) -

sDPS Green Sturgeon (T) -

12.0 ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -

CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -

CVSR Chinook Salmon Critical Habitat -

SRWR Chinook Salmon Critical Habitat -

NC Steelhead Critical Habitat -

CCC Steelhead Critical Habitat -

SCCC Steelhead Critical Habitat -

SC Steelhead Critical Habitat -

CCV Steelhead Critical Habitat -

Eulachon Critical Habitat -

sDPS Green Sturgeon Critical Habitat -

13.0 **ESA Marine Invertebrates**

Range Black Abalone (E) -

Range White Abalone (E) -

14.0 **ESA Marine Invertebrates Critical Habitat**

Black Abalone Critical Habitat -

15.0 **ESA Sea Turtles**

East Pacific Green Sea Turtle (T) -

Olive Ridley Sea Turtle (T/E) -

Leatherback Sea Turtle (E) -

North Pacific Loggerhead Sea Turtle (E) -

16.0 **ESA Whales**

Blue Whale (E) -

Fin Whale (E) -

Humpback Whale (E) -

Southern Resident Killer Whale (E) -

North Pacific Right Whale (E) -

Sei Whale (E) -

Sperm Whale (E) -

17.0 **ESA Pinnipeds**

Guadalupe Fur Seal (T) -

18.0 **Essential Fish Habitat**

Coho EFH -

Chinook Salmon EFH - **X**

Groundfish EFH -

Coastal Pelagics EFH -

Highly Migratory Species EFH -

19.0 **MMPA Species**

20.0 **ESA and MMPA Cetaceans/Pinnipeds**
See list at left and consult Monica DeAngelis
monica.deangelis@noaa.gov
562-980-3232

MMPA Cetaceans -

MMPA Pinnipeds -

Quad Name **Latrobe**

Quad Number **38120-E8**

21.0 **ESA Anadromous Fish**

SONCC Coho ESU (T) -

CCC Coho ESU (E) -

CC Chinook Salmon ESU (T) -

CVSR Chinook Salmon ESU (T) -

SRWR Chinook Salmon ESU (E) -

NC Steelhead DPS (T) -

CCC Steelhead DPS (T) -

SCCC Steelhead DPS (T) -

SC Steelhead DPS (E) -

CCV Steelhead DPS (T) - **X**

Eulachon (T) -

sDPS Green Sturgeon (T) -

22.0 **ESA Anadromous Fish Critical Habitat**

SONCC Coho Critical Habitat -

CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -

CVSR Chinook Salmon Critical Habitat -

SRWR Chinook Salmon Critical Habitat -

NC Steelhead Critical Habitat -

CCC Steelhead Critical Habitat -

SCCC Steelhead Critical Habitat -

SC Steelhead Critical Habitat -

CCV Steelhead Critical Habitat -

Eulachon Critical Habitat -

sDPS Green Sturgeon Critical Habitat -

23.0 **ESA Marine Invertebrates**

Range Black Abalone (E) -

Range White Abalone (E) -

24.0 **ESA Marine Invertebrates Critical Habitat**

Black Abalone Critical Habitat -

25.0 **ESA Sea Turtles**

East Pacific Green Sea Turtle (T) -

Olive Ridley Sea Turtle (T/E) -

Leatherback Sea Turtle (E) -

North Pacific Loggerhead Sea Turtle (E) -

26.0 **ESA Whales**

Blue Whale (E) -

Fin Whale (E) -

Humpback Whale (E) -

Southern Resident Killer Whale (E) -

North Pacific Right Whale (E) -

Sei Whale (E) -

Sperm Whale (E) -

27.0 **ESA Pinnipeds**

Guadalupe Fur Seal (T) -

28.0 **Essential Fish Habitat**

Coho EFH -

Chinook Salmon EFH - **X**

Groundfish EFH -

Coastal Pelagics EFH -

Highly Migratory Species EFH -

29.0 **MMPA Species**

30.0 **ESA and MMPA Cetaceans/Pinnipeds**
See list at left and consult Monica DeAngelis
monica.deangelis@noaa.gov
562-980-3232

MMPA Cetaceans -

MMPA Pinnipeds -

Note: There is no NMFS species list for the Shingle Springs, CA 7.5-minute quadrangle.

APPENDIX B

Representative Photographs



Photo 1. Annual Grassland. Photo Taken Facing West-Northwest from 38.642177, -121.007827 on August 8, 2024.



Photo 2. Blue Oak Woodland. Photo Taken Facing East from 38.63995, -121.005209 on August 8, 2024.



Photo 3. Blue Oak Savannah. Photo Taken Facing Southwest from 38.630393, -121.004109 on August 8, 2024.



Photo 4. Interior Live Oak Woodland. Photo Taken Facing Northeast from 38.65351, -121.025159 on August 9, 2024.

Representative Photographs of Study Area



Photo 5. Closed Canopy Oak Woodland. Photo Taken Facing East from 38.648274, -121.015979 on August 9, 2024.

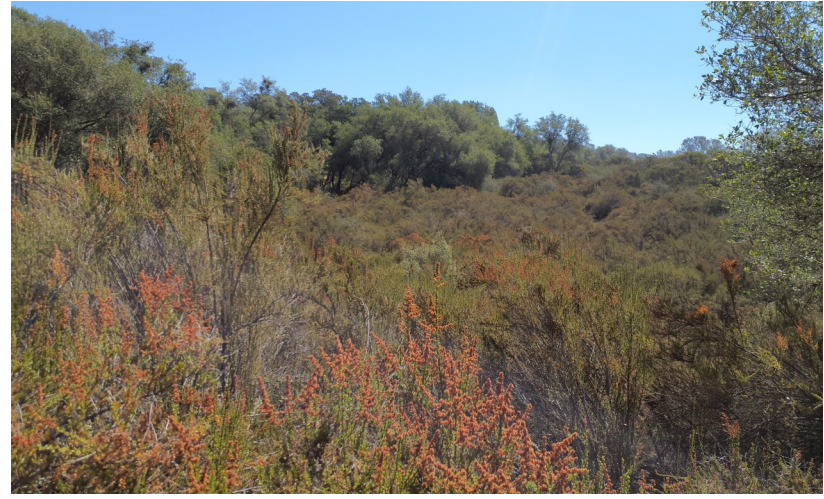


Photo 6. Chamise Chaparral. Photo Taken Facing Southeast from 38.64937, -121.016361 on August 9, 2024.



Photo 7. Whiteleaf Manzanita Chaparral. Photo Taken Facing Southeast from 38.636067, -120.995282 on August 8, 2024.



Photo 8. Marble Valley Road. Photo Taken Facing Southwest from 38.642374, -121.010818 on August 9, 2024.

Representative Photographs of Study Area



Photo 9. Seasonal Wetland with Riparian Vegetation. Photo Taken Facing South from 38.638425, -121.01066 on August 8,



Photo 10. Seasonal Wetland within an Intermittent Drainage. Photo Taken Facing South from 38.621563, -121.996729 on August 8, 2024.



Photo 11. Seasonal Wetland Swale. Photo Taken Facing Southeast from 38.636655, -120.998677 on August 8, 2024.



Photo 12. Seep Dominated by Italian Thistle. Photo Taken Facing Southwest from 38.654434, -121.022241 on August 9, 2024.

Representative Photographs of Study Area



Photo 13. Deer Creek and Valley Oak Riparian Corridor. Photo Taken Facing Northeast from 38.621722, -120.997632 on August 8, 2024.



Photo 14. Seasonal Creek. Photo Taken Facing West-Northwest from 38.643468, -121.012989 on August 8, 2024.



Photo 15. Intermittent Drainage. Photo Taken Facing West-Northwest from 38.621247, -120.996925 on August 8, 2024.



Photo 16. Ephemeral Drainage. Photo Taken Facing South-Southeast from 38.625645, -121.000154 on August 8, 2024.

Representative Photographs of Study Area



Photo 17. Perennial Quarry Pond. Photo Taken Facing West from 38.643161, -121.011423 on August 8, 2024.



Photo 18. Seasonal Quarry pond. Photo Taken Facing North from 38.639195, -121.009659 on August 8, 2024.



Photo19. Elderberry Shrub. Photo Taken Facing West-Northwest from 38.640893, -121.009985 on August 8, 2024.



Photo 20. Project Overview – Quarry Pond in the Background, Facing South 16 Aug 2024

Representative Photographs of Study Area



Photo 21. Offsite Infrastructure – Bass Lake Road Interchange, Facing South 16 Aug 2024



Photo 22. Offsite Infrastructure – Dry Utilities Extension, Facing Northeast 16 Aug 2024



Photo 23. Offsite Infrastructure – Marble Valley Parkway, Facing East 16 Aug 2024



Photo 24. Offsite Infrastructure – Sewer Line, Facing East 16 Aug 2024

Representative Photographs of Study Area



Photo 25. Offsite Infrastructure – US50-Cambridge Road Interchange, Facing East 16 Aug 2024

Representative Photographs of Study Area

APPENDIX C

Plant Species Observed

SCIENTIFIC NAME	COMMON NAME
ADOXACEAE	MUSKROOT FAMILY
<i>Sambucus mexicana</i>	Blue elderberry
ALISMATACEAE	WATER-PLANTAIN FAMILY
<i>Alisma triviale</i>	Northern water plantain
<i>Sagittaria montevidensis</i> ssp. <i>calycina</i>	Giant arrowhead
ANACARDIACEAE	SUMAC FAMILY
<i>Toxicodendron diversilobum</i>	Poison oak
APIACEAE	CARROT FAMILY
<i>Conium maculatum</i> *	Poison hemlock
<i>Daucus carota</i> *	Queen Anne's lace
<i>Daucus pusillus</i>	American wild carrot
<i>Torilis arvensis</i> *	Field hedge parsley
APOCYNACEAE	DOGBANE FAMILY
<i>Asclepias eriocarpa</i>	Woolypod milkweed
<i>Asclepias fascicularis</i>	Narrow-leaf milkweed
ARACEAE	ARUM FAMILY
<i>Lemna</i> sp.	Duckweed
ASTERACEAE	SUNFLOWER FAMILY
<i>Artemisia douglasiana</i>	Mugwort
<i>Baccharis pilularis</i>	Coyote brush
<i>Carduus pycnocephalus</i> *	Italian thistle
<i>Centaurea melitensis</i> *	Tocalote
<i>Centaurea solstitialis</i> *	Yellow star-thistle
<i>Chondrilla juncea</i> *	Skeleton weed
<i>Cichorium intybus</i> *	Chicory
<i>Cirsium vulgare</i> *	Bull thistle
<i>Dittrichia graveolens</i> *	Stinkwort
<i>Helenium puberulum</i>	Sneezeweed
<i>Heterotheca grandiflora</i>	Telegraph weed
<i>Holocarpha virgata</i>	Narrow tarplant
<i>Lactuca serriola</i> *	Prickly lettuce

SCIENTIFIC NAME	COMMON NAME
ASTERACEAE	SUNFLOWER FAMILY
<i>Leontodon saxatilis</i> *	Hairy hawkbit
<i>Logfia gallica</i> *	Narrowleaf cotton rose
<i>Madia exigua</i>	Little tarweed
<i>Madia gracilis</i>	Slender tarweed
<i>Silybum marianum</i> *	Milk thistle
<i>Xanthium strumarium</i>	Rough cockle-bur
BETULACEAE	BIRCH FAMILY
<i>Alnus rhombifolia</i>	White alder
BORAGINACEAE	BORAGE FAMILY
<i>Phacelia</i> sp.	Phacelia
<i>Plagiobothrys</i> sp.	Popcorn-flower
BRASSICACEAE	MUSTARD FAMILY
<i>Hirschfeldia incana</i> *	Shortpod mustard
<i>Nasturtium officinale</i>	Water cress
CARYOPHYLLACEAE	PINK FAMILY
<i>Silene gallica</i> *	Common catchfly
CYPERACEAE	SEDGE FAMILY
<i>Carex</i> spp.	Sedge
<i>Cyperus eragrostis</i>	Tall flatsedge
<i>Eleocharis acicularis</i> var. <i>acicularis</i>	Least spikerush
<i>Eleocharis macrostachya</i>	Creeping spikerush
ERICACEAE	HEATH FAMILY
<i>Arctostaphylos viscida</i>	Whiteleaf manzanita
EUPHORBIACEAE	SPURGE FAMILY
<i>Croton setiger</i>	Turkey mullein
<i>Euphorbia oblongata</i> *	Egg leaf spurge
<i>Triadica sebifera</i> *	Chinese tallow
FABACEAE	LEGUME FAMILY
<i>Acemispom americanus</i>	Spanish clover
<i>Acemispom glaber</i>	Deerweed

SCIENTIFIC NAME	COMMON NAME
FABACEAE	LEGUME FAMILY
<i>Melilotus albus</i> *	White sweetclover
<i>Trifolium dubium</i> *	Shamrock clover
<i>Trifolium glomeratum</i> *	Clustered clover
<i>Trifolium hirtum</i> *	Rose clover
<i>Vicia sativa</i> *	Spring vetch
<i>Vicia villosa</i> *	Hairy vetch
FAGACEAE	OAK FAMILY
<i>Quercus douglasii</i>	Blue oak
<i>Quercus lobata</i>	Valley oak
<i>Quercus wislizeni</i>	Interior live oak
GENTIANACEAE	GENTIAN FAMILY
<i>Zeltnera muehlenbergii</i>	Muehlenberg's centaury
GERANIACEAE	GERANIUM FAMILY
<i>Geranium dissectum</i> *	Cut-leaved geranium
HALORAGACEAE	WATER-MILFOIL FAMILY
<i>Myriophyllum</i> sp.*	Water milfoil
HYPERICACEAE	ST. JOHN'S WORT FAMILY
<i>Hypericum concinnum</i>	Goldwire
<i>Hypericum perforatum</i> *	Klamath weed
JUGLANDACEAE	WALNUT FAMILY
<i>Juglans hindsii</i>	Black walnut
JUNCACEAE	RUSH FAMILY
<i>Juncus balticus</i> ssp. <i>ater</i>	Baltic rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus xiphioides</i>	Iris-leaf rush
LAMIACEAE	MINT FAMILY
<i>Mentha pulegium</i> *	Pennyroyal
<i>Mentha spicata</i> *	Spearmint
<i>Stachys albens</i>	White-stem hedge-nettle
<i>Trichostema lanceolatum</i>	Vinegar weed

SCIENTIFIC NAME	COMMON NAME
LINACEAE	FLAX FAMILY
<i>Linum bienne</i> *	Narrow-leaved flax
MORACEAE	MULBERRY FAMILY
<i>Ficus carica</i> *	Common fig
MYRSINACEAE	MYRSINE FAMILY
<i>Lysimachia arvensis</i> *	Scarlet pimpernel
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Epilobium brachycarpum</i>	Panicled willow-herb
<i>Epilobium ciliatum</i>	Hairy willow-herb
OROBANCHACEAE	BROOMRAPE FAMILY
<i>Castilleja attenuata</i>	Narrow leaved owl's clover
PARMELIACEAE	PARMELIA FAMILY
<i>Usnea</i> sp.	Beard lichen
PHRYMACEAE	LOPSEED FAMILY
<i>Diplacus aurantiacus</i>	Sticky monkeyflower
<i>Erythranthe cardinalis</i>	Scarlet monkeyflower
<i>Erythranthe guttata</i>	Yellow monkeyflower
PINACEAE	PINE FAMILY
<i>Pinus sabiniana</i>	Gray pine
PLANTAGINACEAE	PLANTAIN FAMILY
<i>Plantago erecta</i>	California plantain
<i>Plantago lanceolata</i> *	English plantain
<i>Veronica americana</i>	American speedwell
POACEAE	GRASS FAMILY
<i>Aegilops triuncialis</i> *	Barbed goatgrass
<i>Agrostis</i> sp.	Bentgrass
<i>Aira caryophyllea</i> *	Silvery hairgrass
<i>Avena</i> sp.*	Wild oat
<i>Brachypodium distachyon</i> *	False brome
<i>Briza minor</i> *	Little quaking grass
<i>Bromus diandrus</i> *	Ripgut brome

SCIENTIFIC NAME	COMMON NAME
POACEAE	GRASS FAMILY
<i>Bromus hordeaceus</i> *	Soft brome
<i>Bromus madritensis</i> *	Foxtail brome
<i>Cynodon dactylon</i> *	Bermuda grass
<i>Cynosurus echinatus</i> *	Hedgehog dog-tail grass
<i>Elymus caput-medusae</i> *	Medusahead grass
<i>Elymus hispidus</i> *	Intermediate wheatgrass
<i>Festuca myuros</i> *	Rat-tail fescue
<i>Festuca perennis</i> *	Italian ryegrass
<i>Gastridium phleoides</i>	Nit grass
<i>Holcus lanatus</i> *	Velvet grass
<i>Leersia oryzoides</i>	Rice cutgrass
<i>Paspalum dilatatum</i> *	Dallis grass
<i>Polypogon monspeliensis</i> *	Annual rabbit-foot grass
<i>Stipa</i> sp.	Needle grass
POLEMONIACEAE	PHLOX FAMILY
<i>Leptosiphon</i> sp.	Leptosiphon
<i>Navarretia intertexta</i>	Interwoven navarretia
POLYGONACEAE	BUCKWHEAT FAMILY
<i>Persicaria hydropiperoides</i>	Water pepper
<i>Persicaria</i> sp.	Smartweed
<i>Rumex crispus</i> *	Curly dock
POTAMOGETONACEAE	PONDWEED FAMILY
<i>Potamogeton</i> sp.	Pondweed
PTERIDACEAE	BRAKE FAMILY
<i>Pentagramma triangularis</i>	Goldenback fern
RANUNCULACEAE	BUTTERCUP FAMILY
<i>Ranunculus californicus</i>	California buttercup
RHAMNACEAE	BUCKTHORN FAMILY
<i>Ceanothus cuneatus</i>	Buck brush
<i>Frangula californica</i>	California coffeeberry

SCIENTIFIC NAME	COMMON NAME
RHAMNACEAE	BUCKTHORN FAMILY
<i>Rhamnus ilicifolia</i>	Holly-leaf redberry
ROSACEAE	ROSE FAMILY
<i>Adenostoma fasciculatum</i>	Chamise
<i>Heteromeles arbutifolia</i>	Toyon
<i>Prunus</i> sp.*	Prunus
<i>Rubus armeniacus</i> *	Himalayan blackberry
RUBIACEAE	MADDER FAMILY
<i>Cephalanthus occidentalis</i>	Common buttonbush
<i>Galium</i> sp.	Bedstraw
SALICACEAE	WILLOW FAMILY
<i>Populus fremontii</i>	Fremont's cottonwood
<i>Salix exigua</i>	Sandbar willow
<i>Salix gooddingii</i>	Goodding's black willow
<i>Salix laevigata</i>	Red willow
<i>Salix lasiolepis</i>	Arroyo willow
SAPINDACEAE	SOAPBERRY FAMILY
<i>Aesculus californica</i>	California buckeye
SCROPHULARIACEAE	FIGWORT FAMILY
<i>Scrophularia californica</i>	California figwort
<i>Verbascum blattaria</i> *	Moth mullein
<i>Verbascum thapsus</i> *	Common mullein
SELAGINELLACEAE	SPIKEMOSS FAMILY
<i>Selaginella</i> sp.	Spikemoss
TAXODIACEAE	BALD CYPRESS FAMILY
<i>Sequoia sempervirens</i>	Coast redwood (cultivated)
THEMIDACEAE	BRODIAEA FAMILY
<i>Brodiaea elegans</i>	Harvest brodiaea
TYPHACEAE	CATTAIL FAMILY
<i>Typha latifolia</i>	Broad-leaf cattail
VISCACEAE	MISTLETOE FAMILY

SCIENTIFIC NAME	COMMON NAME
<i>Phoradendron leucarpum</i>	American mistletoe
VITACEAE	GRAPE FAMILY
<i>Vitis californica</i>	California wild grape

Notes: * = non-native species

APPENDIX D

Wildlife Species Observed

COMMON NAME	SCIENTIFIC NAME
Fish	
Mosquitofish	<i>Gambusia affinis</i>
Amphibians	
American bullfrog	<i>Lithobates catesbeianus</i>
Reptiles	
Western fence lizard	<i>Sceloporus occidentalis</i>
Western terrestrial garter snake	<i>Thamnophis elegans elegans</i>
Birds	
Wild Turkey*	<i>Meleagris gallopavo</i>
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Mourning Dove	<i>Zenaida macroura</i>
Anna's Hummingbird	<i>Calypte anna</i>
Turkey Vulture	<i>Cathartes aura</i>
White-tailed Kite	<i>Elanus leucurus</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Great Horned Owl	<i>Bubo virginianus</i>
Acorn Woodpecker	<i>Melanerpes formicivorus</i>
Nuttall's Woodpecker	<i>Dryobates nuttallii</i>
Northern Flicker	<i>Colaptes auratus</i>
Black Phoebe	<i>Sayornis nigricans</i>
California Scrub-Jay	<i>Aphelocoma californica</i>
Oak Titmouse	<i>Baeolophus inornatus</i>
Barn Swallow	<i>Hirundo rustica</i>
Bushtit	<i>Psaltriparus minimus</i>
Wrentit	<i>Chamaea fasciata</i>
Phainopepla	<i>Phainopepla nitens</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
Lesser Goldfinch	<i>Spinus psaltria</i>

COMMON NAME	SCIENTIFIC NAME
California Towhee	<i>Melospiza crissalis</i>
Spotted Towhee	<i>Pipilo maculatus</i>
Mammals	
California vole	<i>Microtus californicus</i>
Mule deer	<i>Odocoileus hemionus</i>
Bobcat	<i>Lynx rufus</i>
American black bear	<i>Ursus americanus</i>

Notes: * = non-native species

Appendix C

**Cameron Park CSD and El Dorado Hills CSD Parks
and Recreation Facilities Demand Assessment**

I N T E R N A T I O N A L

March 10, 2025

Cameron Welch, Senior Planner
EL DORADO COUNTY
PLANNING AND BUILDING DEPARTMENT
2850 Fairlane Court
Placerville, CA 95667

RE: CAMERON PARK COMMUNITY SERVICES DISTRICT AND EL DORADO HILLS COMMUNITY SERVICES DISTRICT PARKS AND RECREATION FACILITIES DEMAND ASSESSMENT

Dear Mr. Welch:

Michael Baker International, Inc. is pleased to submit this technical letter report documenting the results of the Cameron Park Community Services District and El Dorado Hills Community Services District parks and recreation facilities demand assessment.

INTRODUCTION

The County of El Dorado is currently processing applications for two specific plan projects in and around the El Dorado Hills and Cameron Park communities south of US Highway 50: the Village of Marble Valley Specific Plan (VMVSP) and the Lime Rock Valley Specific Plan (LRVSP). The VMVSP is within the boundary of the El Dorado Hills Community Services District (EDHCSD), and the LRVSP is adjacent to the vicinity of the EDHCSD and within the vicinity of the Cameron Park Community Services District (CPCSD). Figure 1 shows the boundaries of the two community service districts (CSDs) and the plan areas' locations relative to those boundaries.

This assessment, which evaluates the potential demand on parks and recreation facilities in the CPCSD and EDHCSD resulting from development of the proposed specific plans, was initiated by and is under the direction of the El Dorado County Planning and Building Department. Information and data provided in this document were compiled from numerous publicly available documents, which are listed in the "References" section, along with discussions with County and CSD staff.

BACKGROUND

The proposed VMVSP is in the El Dorado Hills community, immediately south of US Highway 50, east of the US Highway 50 Bass Lake Road interchange, and southwest of the US Highway 50/Cambridge Road interchange. The proposed LRVSP is south of US Highway 50 in the Cameron Park community, a little over 1 mile south of Durock Road, and is bounded by Cameron Estates on the north, Royal Equestrian Estates on the south, and the proposed VMVSP on the west.

The proposed VMVSP would create a mixed-use community consisting of residential, commercial, retail, agricultural, and open space uses. The plan provides for development of up to 3,236 residential units, 475,000 square feet of commercial uses, 55 acres of agricultural uses, 87 acres of public facilities/recreational uses (including 2 public schools and 47 acres of public parkland), and 61 acres of road areas and future right-of-way. In addition, 1,284 acres would be designated as

open space, which would include 466 acres of natural open space land for passive day-use park or private natural open space. The land use plan is shown in Attachment A-1.

Although the VMVSP project site was approved for development in 1998 (Marble Valley Master Plan), the site was not developed. Consequently, there are no developed parks or recreational facilities within the VMVSP area. The VMVSP site is not directly adjacent to any existing parklands or developed recreational facilities. The unimproved El Dorado Trail passes nearby. As identified in the VMVSP, the proposed Village Park sites would consist of 47 acres of public parkland (10.5 acres of this would include Marble Lake) and would also allow for an additional 12 acres of neighborhood parks in the residential neighborhoods.

The proposed LRVSP would create a new residential community consisting of residential, park, and open space uses. The plan provides for the development of up to 800 residential units and an 8-acre Village Park. It also includes 335 acres of open space that encloses the entire extent of a former underground limestone mine in the plan area and setbacks from the mine to address potential mine collapse hazards. The land use plan is shown in Attachment A-2. There are no developed recreational resources in the LRVSP area, nor is the specific plan area directly adjacent to any existing parklands or developed recreational facilities. The unimproved El Dorado Trail forms a portion of the LRVSP's eastern border.

There are two community service districts that provide park and recreation facilities in the immediate vicinity of the two specific plan areas: the EDHCSD and the CPCSD. Details about facilities in each are provided in "Existing Conditions," below.

As shown in Figure 1, the proposed VMVSP area is within the boundary of the EDHCSD, which would be responsible for the design and maintenance of any park sites dedicated to the EDHCSD by the project. The LRVSP area is not within the boundaries of either the EDHCSD or the CPCSD, but it is adjacent to the EDHCSD. The boundary of the CPCSD is north of the LRVSP area. Details about each district's service area, facilities, population, use (demand), and revenue sources are provided below.

EXISTING CONDITIONS

Cameron Park Community Services District

Service Area and Facilities

The CPCSD is located within the western region of the County of El Dorado and generally encompasses the areas that make up most of the community of Cameron Park, with the majority of the CPCSD boundaries located north of US Highway 50 and a small portion south of US Highway 50. Services and facilities are concentrated around the Cameron Park Drive/Cambridge Road corridor between US Highway 50 and Green Valley Road. The CPCSD is one of many special districts in the area, including the EDHCSD, Cameron Estates CSD, Rescue Fire Protection Department (FPD), and El Dorado County FPD.

As of 2023, the CPCSD's jurisdictional boundary is 4,667 acres or 7.3 square miles. There are two service areas: all services, and all services except fire protection. The area where the CPCSD provides all services is approximately 4,160 acres, or 6.5 square miles, and has a coterminous Sphere of Influence (SOI). The "limited services area" where CPCSD provides all empowered

services except for fire suppression encompasses an additional 232 acres, or 0.4 square miles, and has an SOI that extends to an additional 1,134 acres. The “limited services area” falls within the jurisdiction of one of three other fire service providers (LAFCO 2023: 7).

The CPCSD *Parks and Recreation Master Plan Update*, adopted in May 2014, is the most recent planning document for the district regarding parks and recreation, and guides CPCSD decisions and actions related to the provision of park facilities and recreation programs in the district. The *Parks and Recreation Master Plan Update* presents CPCSD goals and policies related to parks and recreation; the demographic composition of the community, park facilities, and programs; planning standards; community needs; and recommendations on implementation.

The CPCSD *Parks and Recreation Master Plan Update* reported “the vast majority of the residential parcels in the CPCSD have been developed. Only about 554 acres of land zoned for residential use in the CPCSD remains undeveloped. Most of those remaining are scattered individual or small groupings of in-fill parcels zoned for single family homes.” The master plan goes on to note that “the more significant development potential is in the unincorporated areas around the CPCSD, including areas between the CPCSD, El Dorado Hills CSD, and Shingle Springs,” with specific reference to “large planned residential developments, such as Marble Valley and Lime Rock Valley” (CPCSD 2014: 23).

The CPCSD manages a total of approximately 143 acres of parkland, approximately 109 acres of which is developed parkland for recreation use. The 143 acres include five community parks (Cameron Park Community Center, Cameron Park Lake, Christa McAuliffe Park, Rasmussen Park, and Bonanza Park Disc Golf Course); six neighborhood parks (David West Park, Dunbar Park site [undeveloped], Eastwood Park, Gateway Park, Paul J. Ryan Memorial Dog Park [formerly Hacienda Park], and Northview Park); and three natural areas (Knollwood Park Site, Royal Oaks, and Sandpiper Park Site). Only one of the natural areas (Royal Oaks) has improvements; however, as of February 2025, only the walking trail is accessible. The remaining two (Knollwood and Sandpiper sites) are currently used for natural resource preservation. In January 2025, the CPCSD noted that the Dunbar, Gateway, Knollwood, Sandpiper, and Royal Oaks parks/areas are underperforming, and began exploring options to relieve the CPCSD of active responsibility for their maintenance and insurance costs (CPCSD 2025b). As of February 2025, no action has been taken on this issue.

Each category of park in the CPCSD has a designated service ratio (or standard) based on the number of acres required per 1,000 population, as follows: neighborhood (2.0); community (3.0); and open space preserves (5.0). As reported in the 2014 master plan, there is a surplus of community park and open space preserves, but the district is deficient in neighborhood parks by 5.3 acres (CPCSD 2014: 4). By 2023,¹ it would need a total of 43.5 acres of neighborhood parks (i.e., 10.8 acres of additional neighborhood parkland beyond the existing 32.7 acres) to adequately serve its residents (ICF 2024a: 3.13-9). According to the master plan, specific facilities that are needed include more sports courts and fields, a disc golf course (which has since been constructed and is operational), new equipment at existing parks, and master planning for improvements at Dunbar Park site, Sandpiper Park site, and Gateway Park. The master plan goes on to note that as new neighborhood parks are developed in the underserved areas, consideration should be given to including these types of facilities in the new parks (CPCSD 2014:

¹ The master plan assumed a CPCSD population of 21,748 by 2023 (CPCSD 2014: 1).

4). While the master plan noted the need for more sports courts and fields, it did not indicate the deficiency was causing issues at other parks, creating facility maintenance or deterioration issues.

The 2014 master plan identified four locations where the neighborhood parkland deficit could be addressed. One is the Green Valley Road Corridor area (in the vicinity of Gateway Park and Dunbar Park and Sandpiper Park sites), where a new park should be at least 5 acres to allow space for multiple sports fields and courts, children's play area, covered group and individual picnic areas, and walking paths with exercise stations. In the Southwest area (west of Cambridge Drive in the vicinity of the Knollwood Drive area), a neighborhood park could be created by identifying and purchasing suitable acreage or through land dedication during the development review process if a large enough project is proposed. The existing Christa McAuliffe Park is 7.1 acres and could be expanded to the east, which would increase the potential for larger community events and improvements to accommodate an increased level of use. There is also property east and west of David West Park that could provide potential area for expansion (CPCSD 2014: 72-73).

The Cameron Park Community Center has a variety of facilities to accommodate a range of community needs. The facility has a large assembly hall that can hold up to 350 people, a commercial kitchen, a social room for smaller gatherings, a gymnasium with bleacher seating for more than 200 people, a dance room with a full wall mirror, and two classrooms. Facilities are available to rent by any member of the public. There is also an aquatics center featuring rim-flow design and a 10-lane pool. The center also provides several county-wide services, including offering senior nutrition meals and serving as an evacuation center for county residents.

In addition to the park facilities owned and operated by the CPCSD, several other recreational facilities are located in the area for residents' use. The Cameron Park Country Club includes an 18-hole championship golf course, tennis complex, pool, recreation center, and dining room. The campuses for Blue Oak and Green Valley Elementary Schools and Pleasant Grove and Camerado Springs Middle Schools are within the CPCSD. These schools have multiuse rooms, playgrounds, and sports fields that are used outside of school hours for sports leagues, events, and informal play (CPCSD 2014: 28).

Current Parks and Recreation Facilities Use and Funding

Park Use

The CPCSD has not historically tracked the number of visitors to its parks where no fees are charged because there are no attendants at those parks, with the exception of Cameron Park Lake, which charges an entry fee.² Cameron Park Lake offers numerous amenities, including access to the Bonanza Park Disc Golf course, is the largest facility in terms of acreage, and attracts many visitors on an annual basis. The number of visitors to other facilities, such as Rasmussen Park and Christa McAuliffe Park, is both a function of casual use and organized activities (e.g., softball, baseball, and soccer, respectively) for which rental fees are charged. For example, there are over 10 sports

² In early 2024, the staff-attended kiosk where the entry fee was charged became inactive and then was subsequently removed. Installation of an automated gate is in progress, at which time the fee will be collected when it becomes operational.

clubs in the El Dorado Hills and Cameron Park communities that use these sports fields, in addition to club swimming at the Community Center.

In conjunction with the preparation of this assessment, the CPCSD has coordinated with the EDHCSD to develop estimates of park visitors for some of the CPCSD's most-frequented facilities. The estimates for 2024 were generated on a publicly available commercial software artificial intelligence platform (Hornstra 2025). The Placer Labs, Inc. platform (<https://www.placer.ai/>) is proprietary software available via license to the user. The software leverages mobile location data to provide intelligence on a selected location. The tool allows the user to create a unique point of interest, in this case park facilities, in which the software collects and analyzes trip origin and destination data from mobile devices sourced from its partner mobile applications. This mobile location data is aggregated and up-leveled to avoid sharing any individual-level data and ensure privacy. The program generates information such as origin/destination by zip codes and trade area to generate visit data, frequency, and visit trends, among other types of information (Hornstra 2024). Results are summarized in Table 1.

TABLE 1						
CPCSD PARKS AND RECREATION FACILITIES VISITOR ESTIMATES						
Location (Park Type)	Visits (2024)	Visitor Origin (Cameron Park/Shingle Springs)^a	Visitor Origin (Rescue)^a	Visitor Origin (El Dorado Hills)^a	Visitor Origin (Folsom)^a	Visitor Origin (Other Locations)^{a,b}
Cameron Park Lake (Community)	75,000	40.2%	9.8%	6.2%	3.9%	39.9%
Cameron Park Aquatics (Community Center)	20,400	38.6%	6.2%	24.5%	4.8%	25.9%
Christa McAuliffe Park (Community)	47,100	48.6%	3.2%	14.1%	1.8%	32.3%
David West Park (Neighborhood)	7,700	28.2%	8.5%	4.8%	7.0%	51.9%
Rasmussen Park (Community)	45,900	52.5%	9.0%	3.1%	2.3%	33.1%
<i>Source: Compiled from EDHCSD 2025.</i>						
<i>Notes:</i>						
<i>^a number of visits, expressed as percentage, based on zip code of trip origin mobile location data used in the software.</i>						
<i>^b includes the greater Sacramento region, other El Dorado County west slope locations, and other more-distant locations.</i>						

Based on the data generated by the software platform, most of the visits to CPCSD parks included in the analysis, on a percentage basis, originate from the Cameron Park/Rescue area and El Dorado Hills. With respect to the El Dorado Hills component, as shown in Table 1, approximately 25 percent of the visits to Cameron Park Aquatics (Community Center) and 15 percent of the visits to Christa McAuliffe Park are from El Dorado Hills. This is a function of the close proximity of El

Dorado Hills (which is in the EDHCSD), and it also indicates substantial cross-district use. In addition, the data show that non-resident (i.e., trips originating from locations other than Cameron Park/Shingle Springs, including visitors from the greater Sacramento region and beyond), account for a substantial number of visits as well (CPCSD 2025b; EDHCSD 2025).

For example, Cameron Park Lake generates the most visits of all the CPCSD facilities. Historically, approximately 75 percent of the daily visits were from Cameron Park residents (CPCSD 2014: 48). However, as indicated by the data in Table 1, and as noted by the CPCSD, resident use has decreased to approximately 40 percent as of 2024 and non-resident use comprises a greater percentage. Similarly, non-resident visits to the Community Center, Christa McAuliffe Park, and David West Park are greater than resident visits on a percentage basis.

In a letter from the CPCSD to County Planning staff in June 2024, the CPCSD stated that “the CPCSD already serves substantial elements of El Dorado Hills CSD residents for our aquatics, sports programs, and fully developed lake activities. For example, in swim team usage, the CPCSD recently had 250 residents from Cameron Park and 500 from the EDHCSD. We also know that residents from the development between Bass Lake Road and our western border come to Cameron Park for many of our programs.”(CPCSD 2024b)

For smaller parks such as dog parks and informal park areas with picnic tables, they represent a smaller percentage of visits, primarily due to size, availability of amenities, and/or location.

The Placer.ai data also provide an indicator of the relationship between the number of visits to a particular site relative to the size of the facility. That is, size may not necessarily be the primary determinant of a park's attractiveness. Unique features or the type of park design are key factors. Fields designed for youth sports have a substantially higher amount of visits, with points of origin from farther distances than other types of parks. Also, youth athletic groups request use at specific parks that best suit their sport and user needs. Examples of this in the CPCSD include Christa McAuliffe Park. While only 7.1 acres, it had the highest number of visits per acre (6,634) in 2024. Rasmussen Park (10.1 acres) had 4,545 visits per acre. By comparison, while Cameron Park Lake is 56.5 acres, it had the lowest number of visits per acre (1,327).

Funding and Revenue

Funding for CPCSD park facilities and recreation programs comes from several sources. As reported in the district's *Parks and Recreation Master Plan Update*, nearly two-thirds of the funding, about 63 percent, typically comes from the General Fund, which includes property taxes. Recreation program fees account for about 17 percent, while facility use fees add another 13 percent. The balance comes from special events (6 percent) and scholarships (1 percent). Property tax revenues are relatively static, pending reassessments of property values and tax rates. Revenues from the other sources, however, can be increased in response to expanded marketing for programs, special events, and facility use (CPCSD 2014: 76). However, as noted in the district's master plan, for developments outside of the CPCSD, there is currently no property tax allocation strategy that provides revenues to the CPCSD for CPCSD park and recreation facilities used by non-CPCSD residents (CPCSD 2014: 23).

Facility Rentals. Five CPCSD park facilities are available for reserved use on a fee basis. These are facilities at the Community Center, Cameron Park Lake, Christa McAuliffe Park, David West Park,

and Rasmussen Park. Fees paid to use these facilities help offset the operational and maintenance costs associated with providing these recreation resources to the community at large. Fee-based reservations are also an indicator of demand for specific types of facilities and may be useful in determining what additional facilities may be needed (CPCSD 2014: 43).

The district's 2014 master plan notes that based on the current CPCSD population and recreation patterns, there is a need for one additional baseball field, four softball fields, three soccer fields, one tennis court, and one basketball court. As indicated in the master plan, these shortfalls may be addressed through a combination of means, the least expensive of which would be to secure joint use agreements with the schools to provide at least some portion of the needed facilities. Limitations on availability of school facilities may require that some additional facilities be developed at CPCSD-owned and -operated parks (CPCSD 2014: 70).

Recreation Programs. The CPCSD provides a wide variety of recreation and life enrichment programs that are an important service to the community. These programs are designed to encourage healthful activities for the fitness of mind and body; to promote positive experiences in the community; and to bring families together to enjoy community and CPCSD resources. By policy of the CPCSD Board of Directors, the operating costs of the recreation programs must generally be self-supporting through fees and charges, except for specialized programs (CPCSD 2014: 28).

All of the recreation programs of the CPCSD, except special events, are offered on a fee basis to the residents of Cameron Park. These same programs are available to non-CPCSD residents for a slight additional fee, generally about 10 percent higher. Historically, as reported in the district's 2014 master plan, about 60 percent of reserved use of the various Community Center spaces was by people who are not CPCSD residents. The district's 2014 master plan notes that this is an indicator that there may be shortage of comparable facilities in the region at the price point provided by the CPCSD (CPCSD 2014: 46).

Other Funding Sources

Landscape and Lighting Assessment Districts (LLADs). CPCSD Policy 3240.20.2 governs LLADs, through which the district recovers maintenance costs for LLADs within the district boundary. The policy establishes that the general benefit must be reviewed by the assessment engineer on a case-by-case basis as new parks are developed, and that the district will not build new parks that are not covered by maintenance LLADs. The CPCSD currently manages 20 active LLADs, comprising 6 neighborhood parks and/or landscaped areas, and 14 with only streetlights (CPCSD 2024c). Three of the LLADs are included on the district's inventory of park facilities (see Attachment B-1).

Planned Improvements

The CPCSD has prioritized several projects to move forward with developing over the next three years, which were approved by the Board of Directors in March 2024. As part of that process, the district identified park impact and/or Quimby fees available for those projects (CPCSD 2024a: Agenda Item #8). The park improvement plan prioritization list identified park projects, community center projects, and small projects. Projects include improvements at Cameron Park Lake and additional amenities at the Community Center pool.

El Dorado Hills Community Services District

Service Area and Facilities

The EDHCSD is located in the western region of El Dorado County, in the Sierra Nevada foothills, 25 miles east of Sacramento, and has an approximate elevation of 1,104 feet above mean sea level. El Dorado Hills is bounded to the north by Folsom Lake and the Folsom Lake State Recreation Area, and to the east by the neighboring community of Cameron Park. The EDHCSD borders the community of Latrobe to the south and the Sacramento County line and the City of Folsom to the west. The area within the current district boundary is approximately 18,079 acres or 28 square miles. There is an identified SOI beyond the district boundaries, which brings the total service area to 21,728 acres, or 33.95 square miles (EDHCSD 2024a: 1).

The EDHCSD is responsible for managing more than 500 acres of public parkland, an amount that has nearly doubled since 2007. With parks ranging from 0.6 acres to 207 acres in size, El Dorado Hills parkland includes parklets; neighborhood, village, and community parks; a regional-reaching park; trails and open spaces; and several special use areas. Within these lands, the district operates and maintains a variety of facilities including sports fields; courts for basketball, tennis, pickleball, and bocce ball; playgrounds; a dog park; a skate park; a gymnasium; a pool and splashpad; and teen and senior centers. While new facilities have come online since 2016 and parkland has been acquired, there are still identified needs across the system that have not yet been satisfied.

School district sites also contribute to the recreation resources available to the El Dorado Hills community, especially school fields and gyms. The EDHCSD has focused on sustaining and expanding joint use agreements to make school assets available for recreation. In addition to public parks and facilities, homeowners associations (HOA) within the EDHCSD own and maintain private parks to serve their residents. Many HOAs also offer recreation facilities such as pools, clubhouses, and sports courts to serve their distinct communities (EDHCSD 2024a: 5).

The EDHCSD's *Parks and Recreation Facilities Master Plan*, developed in 2016 with a five-year update in 2021 and further updates in March 2024, outlines the way EDHCSD parks, facilities, and recreation programs will be managed to respond to anticipated growth and changing recreation trends over a five-year planning period. In January 2025, the EDHCSD initiated activities to further update the plan.

The EDHCSD identifies seven categories of parks within its service area: neighborhood, village, community, open spaces, special use areas, community recreation facilities, and other facilities. Neighborhood parks, located within walking and bicycling distance of most users, range in size from 1 to 3 acres, and are designed primarily for unsupervised, nonorganized recreation. Village parks, 3 to 15 acres in size, are within a half-mile to a mile walking and driving distance of residents. Village parks are intended to provide active and passive recreational opportunities and may have amenities such as trails, bathrooms, play equipment, and facilities for organized sports. Community parks are intended for use by the broader community. They range from 15 to 100 acres in size and feature facilities for organized sports, parking areas, and bathrooms. Community parks may also include passive recreational opportunities and community centers. Open spaces consist of permanent, undeveloped green or open space ranging in size from small to very large and are managed for natural value and recreational use. Open spaces are intended to provide

opportunities for nature-based recreation and the EDHCSD has been identified as one of the organizations that may accept the dedication of public open space lands in the El Dorado Hills area. Special use areas consist of freestanding facilities such as community centers, aquatic centers, sports complexes, teen centers, archery ranges, skate parks, and arts and cultural facilities.

Parks in the EDHCSD service area boundary are a combination of facilities owned and maintained by the EDHCSD, facilities owned and maintained by local HOAs, and joint use of local school grounds. The 726 acres of existing, undeveloped, and planned EDHCSD parkland consist of 14 neighborhood parks, 8 village parks, 2 community parks, 1 regional park, 5 open spaces, and 3 special use areas. Facilities owned and operated by local HOAs comprise approximately 39 acres (as of 2021) privately owned neighborhood parks. Local elementary, middle, and high schools provide 12 additional joint-use recreation facilities in the EDHCSD service area.

Each park category in the EDHCSD has either a designated level of service (LOS) or, in the case of open space, a recommended guideline. There are currently 10.14 acres of developed parkland (regional parks, neighborhood parks, village parks, and community parks) for every 1,000 residents, including HOA parks, which exceeds the LOS standard of 5.0 acres per 1,000 population (EDHCSD 2024a: B-3). The current EDHCSD guideline for open space is 40.5 acres per 1,000 residents. At the time the guideline was established, there were 2,230 acres of private open space in the EDHCSD's boundaries, and it was determined that an additional 1,736 acres of open space were needed. As reported in the EDHCSD's 2024 master plan update, although there is not current data on the inventory of privately held open space in the EDHCSD, the EDHCSD appears to be meeting the 40.5 acres per 1,000 people standard (EDHCSD 2024a: B-5).

Current Parks and Recreation Facilities Use and Funding

Park Use

The EDHCSD has not historically tracked the number of day-use visitors to its parks where no fees are charged for occasional use because there are no attendants at those parks. However, data are available for facilities for which a rental fee is charged (e.g., sports clubs), which is discussed in the "Funding and Revenue" topic, below.

The EDHCSD has compiled data for park use using the Placer.ai software program, as described for the CPCSD, above. Results are summarized in Table 2.

TABLE 2
EL DORADO HILLS CSD PARK VISITOR ESTIMATES

Location (Park Type/Size)	Visits (2024)	Visits per Acre	Visitor Origin (El Dorado Hills)	Visitor Origin (Cameron Park)	Visitor Origin (Folsom)	Visitor Origin More Than Five Miles
Allen Lindsey Park (Special Use/5 acres)	4,600	920	76.1%	2.9%	1.8%	19.2%
Bass Lake Park (Special Use/70 acres)	21,200	303	5.0%	7.5%	4.7%	37.7%
Blackstone Park (Village/13.6 acres)	14,100	6,267	41.8%	17.0%	8.5%	32.6%
El Dorado Hills Community Park (Community/39.5 acres)	247,400	6,263	65.5%	7.0%	5.9%	21.6%
Governors (Neighborhood/1.9 acres)	6,300	3,316	25.4%	6.6%	17.5%	50.6%
Heritage Park (Village/4.65 acres)	32,200	6,925	52.5%	13.0%	6.5%	28.0%
Jeff Mitchell Field (Village/3.67 acres)	17,900	4,877	73.2%	3.6%	3.1%	20.1%
Kalitheia Park (Village/3.8 acres)	65,700	17,289	18.7%	4.6%	12.0%	64.7%
Lake Forest (Village/9.76 acres)	22,400	2,295	49.6%	20.5%	5.8%	24.1%
Promontory Park (Community/18.7 acres)	149,400	7,995	45.6%	5.7%	13.9%	34.8%
Saratoga Park (Village/2.1 acres)	38,600	18,381	26.7%	9.8%	22.5%	40.9%
Village Green (Village/10 acres)	13,200	1,320	21.9%	9.0%	17.4%	51.5%
Wild Oaks (Open Space/10.38 acres)	2,100	202	21.6%	1.3%	6.7%	70.3%
<i>Source: compiled from EDHCSD (2025)</i>						

The data show that park design and amenities are a primary determinant of each park's attractiveness. For example, while Bass Lake is EDHCSD's largest park (70 acres), it had the second lowest visitors per acre (303) in 2024. Conversely, Saratoga Park (2.1 acres) had the highest number of visitors in 2024 (18,381), and the park was only open for eight months beginning in May 2024.

Most of the visits to EDHCSD facilities are from El Dorado Hills, and a substantial number of visits are from Folsom due to its proximity. A substantial number of visits from Cameron Park indicates cross-district use. For the EDHCSD's highest-use parks (Community Park and Promontory Park), 22 percent of the visits to Community Park and 35 percent of the visits to Promontory Park originate more than 5 miles away. These parks are dominated by unique uses and features such as soccer fields, baseball diamonds, and aquatic, suggesting that the appropriate fields and/or amenities used

by organized athletic groups is a greater factor relative to facility use than distance from a resident's home.

Funding and Revenue

The main source of funding for parks and recreation services in the EDHCSD is the General Fund, which comes primarily from taxes levied on property within the district boundary. Other sources of revenue include facility-use charges (e.g., rentals), recreation program user fees, and concessions (earned income). Entry fees for some special events can be charged, where appropriate (EDHCSD 2024a: Appendix D). The cost of facilities and park maintenance that is not covered by the district's recovery fees are paid by the General Fund (Hornstra 2024).

Facility Rentals. For facilities for which rental fees are charged (e.g., sports fields, park picnic areas, pool), Table 3 presents information regarding the number of rentals, whether the renters were resident or non-resident, and associated total revenue. As shown by the data, residents accounted for most of the rentals (and accordingly revenue).

TABLE 3						
EDHCSD RENTALS RESERVATIONS AND REVENUE						
External Reservations		Resident		Non-Resident		2023 Total Revenue
Park Amenities	Total Rentals	Rentals	Percent of Total	Rentals	Percent of Total	
Sports fields	657	510	77.6	147	22.3	\$166,621
Pool	1,347	1,330	98.7	17	1.2	\$96,171
Park picnic areas	196	113	57.6	83	42.3	\$26,939
Other	186	171	91.9	15	8.1	\$9,305
Internal reservations representing recreation activities						
Gym	549					
Pool	401					
Sports fields	268					

Source: Hornstra 2024

The EDHCSD has observed that there is high demand for the current (and only) pool facility with a swim team that is at capacity and has closed enrollment during summertime, but that HOA pools may be meeting some recreational needs (EDHCSD 2024a: B-11; Hornstra 2024).

The EDHCSD has identified two other areas of primary concern regarding user demand at its recreation facilities: the synthetic athletic field at Promontory Park during soccer and lacrosse seasons and in particular during winter/rainy seasons is fully allocated; and Bermuda grass soccer fields during the summer/fall soccer season are fully allocated, with Rescue Unified School District and Buckeye Unified School District (which are joint use agreement fields) being used as secondary fields. The district is concerned that additional residents in those sports groups during their peak playing seasons will likely have an impact on the respective club's ability to receive their requested field space. The EDHCSD also notes that several of its popular special programs are consistently at maximum capacity (Hornstra 2024).

Recreation Programs. The EDHCSD also operates a variety of recreation programs—for example, activities in the community activities building, teen center, and senior center. Table 4 presents the number of enrollments, whether resident or non-resident, and revenue. The number of enrollments for residents and non-residents has shown a slight increase between 2021 and 2023.

Source and Revenue	2023	2022	2021
Resident	22,658	22,800	20,028
Non-resident	4,173	3,683	3,354
Percentage resident	84.5%	86.1%	85.7%
Revenue	\$1,101,397	\$1,010,109	\$721,646
City	Family Enrollment Count		
El Dorado Hills	5,768		
Folsom	341		
Cameron Park	312		
Shingle Springs	120		
Placerville	101		
<i>Source: Hornstra 2024</i>			

Other Funding Sources

Landscape and Lighting Assessment Districts. The EDHCSD manages 25 active LLADs, with an estimated fund balance of approximately \$2.2 million as of September 2024. Six of the LLADs are parks included in the inventory of district-managed parks (see Attachment B-1). Assessment revenues are used for improvements and maintenance. For parks and facilities that are in an LLAD, the LLAD assessment for special benefit covers part of the cost, and the General Fund covers the rest. If there is revenue associated with the park or facility, that revenue is applied to the cost of maintenance before the special benefit calculation is done (Hornstra 2024).

Planned Improvements

The district has identified several planned and proposed park facilities projects in the 2024 updated master plan. Planned parks include a neighborhood park (Eastridge @ Valley View) and four village parks (Bass Lake Hills Park, Sienna Ridge Sports Park, and two Bell Ranch parks), totaling 23.9 acres. Proposed new parks comprising approximately 260 acres include 3 acres of neighborhood park at Saratoga Estates and 28.1 acres of village parks (Eastridge @ Valley View, Saratoga Estates Lot M, and Valley View North). The 47 acres of proposed parks in the VMVSP are included in the list of proposed parks (village park and joint use). However, these parks would only be developed if the VMVSP is approved and implemented and would depend on the buildout timeline for the VMVSP. There is also a proposed community park (51 acres in the Valley View Specific Plan to the west of the VMVSP) as well as open space in Saratoga Estates (27.4 acres). The total also includes a then-proposed 15 acres in the Central El Dorado Hills Specific Plan (EDHCSD 2024: Appendix E).

FUTURE CONDITIONS

Parks and Recreation Facilities Provided by VMVSP and LRVSP

The VMVSP would provide seven Village Parks totaling 47 acres available for public use. The locations of the parks are shown in Attachment A-1. Village Parks 1 and 2 (approximately 21 acres) include the lake, which would have a pier and boat docks for non-motorized recreational boating. Additional amenities around the lake may include jogging and walking paths, turf areas for gatherings, gazebos, and sports fields (lighted or unlighted). Village Parks 3 and 4 may have sports fields and playgrounds for joint-use activities with proposed adjoining schools. Village Park 5 would be focused on the historical aspects of the quarry operations and would include a walking trail. Village Park 6 would accommodate passive uses. Village Park 7 would have active and passive uses such as walking trails and may have play equipment and informal spaces (Marble Valley Company, LLC 2024: 7-12 to 7-14). The VMVSP provides for future programming of design and specific amenities that could be offered in each active-use park, which would be coordinated with the EDHCSD in advance of their construction. This would allow the EDHCSD to consider, for example, whether sports fields should be natural or artificial turf.

The VMVSP also includes a network of Class I multiuse paths, along with a system of sidewalks and paved and unpaved trails throughout the project area, linking residential neighborhoods to the village parks and open space. A Class I multiuse path would connect the VMVSP to the Class 1 multiuse path in the LRVSP and the El Dorado Trail at the eastern edge of the LRVSP and would link Lime Rock Valley with the proposed elementary schools in the Village of Marble Valley to the west. A central gravel trail loop would be connected to paved paths to the east and west. A hiking and equestrian trail through open space in the south would connect to a similar facility in Lime Rock Valley.

In the LRVSP, an 8-acre Village Park adjacent to Lime Rock Valley Road (see Attachment A-2), which would be available to the public, would provide opportunities for active and passive recreation. Permanent facilities may include restrooms, parking, and picnic tables. In addition to the Village Park, the project allows for development of private neighborhood parks (1–3 acres) for the use and enjoyment of residents in private gated residential neighborhoods (Lime Rock Valley, LLC 2024: 3-5). The LRVSP also includes a network of Class 1 multiuse paths, along with a system of sidewalks and paved and unpaved trails throughout the project area, linking residential neighborhoods to the village park and open space. A Class 1 multiuse path would connect the LRVSP to the El Dorado Trail at the eastern edge of the project area and would link Lime Rock Valley with the proposed elementary schools in the Village of Marble Valley to the west.

Future Demand

Park User Demand

The draft environmental impact reports (DEIR) for each of the proposed VMVSP and LRVSP projects, which were circulated for public review in May 2024, evaluated potential population-based demand on parks/recreation for the two projects at buildout. The VMVSP DEIR estimated that buildout of the VMVSP would introduce up to 9,168 park users into the area south of US Highway 50, which would be within the current EDHCSD boundary. The LRVSP DEIR estimated that buildout of the LRVSP would introduce up to 2,640 park users into the area south of Highway 50

(ICF 2024a: 3.13-10; ICF 2024b: 3.13-9).³ However, the LRVSP is not within the boundary of either the EDHCSD or the CPCSD, as shown in Figure 1. The two projects combined project the potential to introduce approximately 11,900 park users in the vicinity of the two districts, which currently have a combined district population of approximately 69,000 (approximately 50,000 in the EDHCSD [EPS 2024a: Table A-1] and approximately 19,000 in the CPCSD [LAFCO 2023: 9]). Growth is expected to continue, with the EDHCSD's population growing to nearly 63,000 residents in 2036, based on Sacramento Area Council of Governments (SACOG) growth projections (EDHCSD 2024: 5), while the resident population in the CPCSD could reach approximately 22,600 in 2036.⁴

The number of park users from both projects that would use CPCSD or EDHCSD facilities (in addition to the facilities within the specific plan areas) would be a function of the type of facilities and recreation programs, access (because both projects are south of US Highway 50), and distance/travel time to parks and recreation facilities.

The number of potential future park and facility users from both specific plan areas who would visit existing CPCSD and EDHCSD parks as well as those who might use park facilities provided by each specific plan, at buildout, were estimated using a "gravity model." This is a model that assumes when given multiple park options, a park user will decide where to go based on park amenities and facilities and the travel time to the park. Acreage is the most general park characteristic and is used as a proxy for the amenities and recreation facilities located at a given park. For example, the larger the park, the more likely it is to offer more recreation opportunities for any given park user. On the other hand, while single-use parks (e.g., a dog park) will have a high attraction to someone who wants to exercise their dog, its attraction relative to other parks is small among the entire set of park users. The model also accounts for estimated park user population and number of visits on a weekly basis. Results of the analysis are summarized in Table 5, with details, including the analysis methodology, provided in Attachment B-1.

³ The DEIR analyses included a review of local recreation planning documents, including the County General Plan Parks and Recreation Element, the County *Parks and Trails Master Plan*, the EDHCSD *Parks and Recreation Facilities Master Plan*, and the CPCSD *Parks and Recreation Master Plan Update*. The assessment included an analysis of the County's Quimby Act parkland dedication requirements: 3.3 people per single-family residential unit and 2.1 people per multifamily unit to estimate the population, in accordance with El Dorado County Code Section 120.12.090.A.9.

⁴ Assumes an annual average growth rate of 0.9 percent applied to the estimated existing population provided in the 2023 Municipal Services Review and SOI Update (LAFCO 2023: 9).

Location of Parks Visited	VMVSP			LRVSP		
	Annual Visits (Buildout)*	Percentage of Annual Visits to Location (Buildout)	Average Park Visitors Per Day (Buildout)	Annual Visits (Buildout)*	Percentage of Annual Visits to Location (Buildout)	Average Park Visitors per Day (Buildout)
Parks in VMVSP	301,100	85%	825	27,500	27%	75
Park in LRVSP	5,900	2%	16	34,000	33%	93
CPCSD	12,800	4%	35	10,900	11%	30
EDHCSD	34,300	9%	93	29,500	29%	80
Total Visits	354,100			101,900		

Source: Detailed calculations provided in Attachment B-1.

Notes:
 *Number of visits projected using the gravity model, and assumes residents from the LRVSP would access CPCSD and EDHCSD parks through the VMVSP. Total of visits for all park facilities combined. Projected visits to each park area are provided in Attachment B-1. The projections are for park use/visits, and do not reflect sports club use of fields.

As indicated by the data, the park facilities provided by the specific plans are conservatively projected using the gravity model to accommodate most of the new park users, particularly for the VMVSP (85 percent of annual visits).

Approximately one-third of the park users generated by the LRVSP are projected to use the LRVSP park, which is planned to be developed in Phase 1 of that project. Less than 5 percent of the new park user population from the VMVSP is projected to visit CPCSD facilities, and less than 15 percent would originate from the LRVSP, on an annual basis. It is important to note that the total number of annual visits, percentages, and average visitors per day summarized in the table is the aggregated average of all the individual facilities combined. Some parks would experience more visits than others. For example, of the approximately 24,000 visits from the VMVSP and LRVSP combined, roughly one-third of the visits would be to Cameron Park Lake, one-third divided between developed parks with amenities, and the rest to the remaining less-developed parks or natural areas.

However, the gravity model does not account for recent trends in playground design, active recreation such as youth or adult athletics (e.g., sports fields), or special features such as a pool, hard courts, or gymnasium. Another limitation of the model is that acreage may not always be an appropriate measure of potential use. As noted in the discussion for Table 1 and Table 2, above, smaller parks can generate more visits per acre than larger parks. On the other hand, the gravity model more accurately tends to predict visits to facilities such as neighborhood parks used for casual recreational use.

In addition, point-of-origin and destination data for 2024 provided by the CPCSD and EDHCSD (Tables 1 and 2, above) generated by the Placer.ai platform, combined with input from the districts suggest that the gravity model appears to overestimate the buildout projection percentage for parks within the specific plans, and that the demand for existing EDHCSD (and CPCSD) facilities would be greater than shown in Table 5 for certain categories of park facilities

(CPCSD 2025a; EDHCSD 2025). This is particularly the case for facilities used for sports/special use because of the types of amenities provided (e.g., youth sports, sports clubs).

Regardless of the potential limitation of the gravity model to predict future demand with certainty, the total number of park users who would use facilities in the EDHCSD or the CPCSD would not occur immediately because both projects would be developed in phases over approximately 20 years or more, depending on housing market conditions and available infrastructure. The increased visits on an annual (or daily) basis in the initial years of project development would be far less than projected for buildout conditions and would increase incrementally over time. For example, in the initial years of project occupancy, the estimated number of annual visits from the VMVSP might be, on average, approximately 2,000 visitors per year to EDHCSD parks and approximately 1,600 visitors per year to CPCSD parks, based on the gravity model -- in both cases less than 10 visitors per day in each district. Detailed calculations are shown in Attachment B-2, which also provides estimates of how park use might increase over time. It is beyond the scope of this analysis and would be speculative to predict which parks would be more or less likely to experience increased use, on an annual basis.

While there would be increased demand on existing facilities, the CPCSD has also identified four areas within its boundary that could be used to increase the amount of developed parkland in the future—i.e., Southwest (new), Green Valley (new), Christa McAuliffe (expansion), and David West (expansion). The CPCSD's 2014 master plan recommended that once land is acquired, the park planning process should be undertaken to identify the specific improvements, configuration, and costs associated with implementing the expanded park vision. Potential sources of funding would vary by the specific location (CPCSD 2014: 72-73).

In addition, the projections do not account for mitigation measure REC-1 identified for the LRVSP, which requires the project to provide an additional minimum 5.2 acres or provide in-lieu funding (see "Physical Impacts," below).

Another consideration is that while there would be increased demand on CPCSD facilities as a result of new residential development in the specific plans, both the VMVSP and LRVSP would provide new public park and recreational facilities that would be available for use by existing (as well as future) residents in Cameron Park and the El Dorado Hills communities.⁵

An estimate of the number of population-based park users projected from Cameron Park who might use the specific plan parks (at buildout conditions) was forecasted using the gravity model methodology as that for estimating what the new demand on EDHCSD and CPCSD would be.

Detailed results of this analysis are provided in Attachment B-3 and summarized in Table 6.

⁵ As noted in the LRVSP DEIR, the project would aid in minimizing the use of similar existing recreational facilities in both the EDHCSD and CPCSD by LRVSP area residents (ICF 2024a: 3.13-10).

TABLE 6
ESTIMATED VISITS TO VMVSP AND LRVSP PARKS FROM
FUTURE POPULATION IN THE CAMERON PARK AREA

VMVSP park visits to CPCSD (buildout)^a	LRVSP park visits to CPCSD (buildout)^a	Total VMVSP and LRVSP park visits to CPCSD (buildout)	Visits from Cameron Park to VMVSP Parks^b	Visits from Cameron Park to LRVSP Park^b	Total Visits from Cameron Park to VMVSP and LRVSP Parks (buildout)	Net change to CPCSD (VMVSP and LRVSP buildout)
12,800 ^c	10,900 ^c	23,700	19,200	4,900	24,100	(400)

Notes:

a Park user visits are based on park use factors (see Notes in Attachment B-1), projected over time (buildout).
b Population estimate assumes 0.9% growth annually per El Dorado County General Plan 2021–2029 Housing Element, to correspond with VMVSP and LRVSP buildout. Population estimates for VMVSP and LRVSP total approximately 11,600 per DEIR Sections 3.11 (Population and Housing), while park user population totals approximately 11,800 per DEIR Sections 3.13 (Recreation). The difference is inconsequential for purposes of this population-based visitor use comparison. The projections are for park use/visits, and do not reflect sports club use of fields.
c From Table 5 this document.

The data illustrate that the difference in park use visits as a function of population, at buildout, could be an overall net reduction in park visits to CPCSD because the VMVSP and LRVSP would provide public parks within the projects. These parks would be accessible to the population in the CPCSD. In addition, as noted above, cross-district use would be expected to continue as such so that LRVSP residents would also have direct access to parks in the VMVSP that would be within the EDHCSD. However, this does not mean there would not be increased incremental demand resulting from the VMVSP and LRVSP on existing CPCSD parks and recreation facilities, as explained above.

In summary, based on available information, precise quantification of potential population demand on the CPCSD and the EDHCSD park facilities resulting from the VMVSP and the LRVSP is not possible at this time. The reasons for this are:

1. The planned parks in the specific plans would not be designed until tentative maps are submitted, which would only occur upon project approvals, so the specific amenities that would be provided in the planned parks of the specific plans are currently unknown.
2. While the Placer.ai software can be used to generate visitor data for existing conditions, its usefulness for predicting future visits is constrained because the specific plan areas are not developed. There is no “real-time” trip origin and destination visitor trip data.
3. The data indicate cross-district and non-resident use, including a substantial number of visits to the CPCSD and EDHCSD from locations not within the districts. Thus, the projections using the gravity model must be viewed in conjunction with the Placer.ai datasets.

The results of this assessment suggest that there would be a range of potential demand on the CSDs from the projects. It is recommended that the project applicants and CSDs continue their coordination to potentially develop a more accurate estimate of park and facility demand. This could include engaging local sport user groups to get their input on their willingness to use the planned parks within the specific plans and how that might, in turn, reduce demand in the

CSDs. In addition, as with existing conditions, even with increased demand from the projects, both CSDs would retain the ability to control the number of visitors to their facilities for which fees are charged (e.g., for organized sports/club use, swimming pools).

Funding Summary

El Dorado County General Plan Objective 10.2.5 and Policies 10.2.5.1 and 10.2.5.2 require the County to evaluate the fiscal impacts of new development on municipal services and to avoid using County General Fund revenues to fund services. The analysis is provided in the fiscal impact analysis (FIA) for each project. The FIA estimates whether the project will generate adequate revenues at buildout to meet the costs of providing services to new development funded through the County General Fund, County Road Fund, and service districts such as the EDHCSD.

A draft FIA prepared in September 2024 identifies that, at buildout, the VMVSP would generate \$3,177,000 in annual net revenue for the EDHCSD from three sources, as shown in Table 7. The draft FIA prepared for the LRVSP in September 2024, which assumed annexation into the EDHCSD, estimated an annual net revenue for the EDHCSD of \$721,000.

TABLE 7 EDHCSD FISCAL IMPACT SUMMARY VMVSP AND LRVSP (BUILDOUT)		
	VMVSP	LRVSP
Recreation programs revenue	\$234,000	\$58,000
Property tax revenue	\$2,927,000	\$659,000
Park and facility rentals revenue	\$16,000	\$4,000
<i>Total Revenue</i>	\$3,177,000	\$721,000
<i>Total Expenditures</i>	\$1,671,000	\$523,000
Annual surplus	\$1,506,000	\$198,000
Annual surplus per unit	\$467	\$248
<i>Source: EPS 2024a Table 1, Table B-2; EPS 2024b Table 1, Table B-2</i>		

Park impact fees are used to finance public facilities and equipment to mitigate the impact of new development on parks and recreation services. The fee is collected at the time of building permit acquisition and must be based on the current LOS to ensure that new development does not pay for any existing deficiencies in park development. The fees must be used to finance the facilities and equipment identified in a Fee Nexus Study and Report in accordance with Government Code Section 66000. The fee may not be used for park and recreation facilities maintenance.

The current park impact fees for the EDHCSD are shown in Table 8.

TABLE 8	
EDHCSD PARK IMPACT FEES RESIDENTIAL DEVELOPMENT	
Type	Fee/Dwelling Unit
Single-family	\$13,495
Multifamily	\$8,907
Single/multifamily affordable	\$8,907
Age-restricted	\$7,886
Mobile home	exempt
Accessory dwelling unit	exempt
<i>Source: EDHCSD 2023: 2</i> <i>Notes: List of impact fees do not include Serrano. Single-family only includes single-family detached homes. Multifamily includes buildings with attached residential units including apartments, townhomes, condominiums, and all other residential units not classified as single-family detached. Age-restricted includes residential development developed, substantially rehabilitated, or substantially renovated for senior citizens that has at least 35 dwelling units, at least 80 percent of the occupied units include at least one resident who is verified to be over the age of 55, or the community follows a policy that demonstrates an intent to provide housing for those aged 55 or older.</i>	

The current park impact fees for the CPCSD are shown in Table 9. Calculated park fees for the 800 single-family units in the LRVSP would be \$5,316,000. It should be noted that the park impact fees for the CPCSD would only be collected if the LRVSP project is annexed into the CPCSD.

TABLE 9	
CPCSD PARK IMPACT FEES RESIDENTIAL DEVELOPMENT	
Type	Fee/Dwelling Unit
Single-family	\$6,645
Multi-family	\$5,435
Mobile home	\$3,402
<i>Source: CPCSD 2019: 3</i> <i>Notes:</i> <i>Fees as adopted by El Dorado County Board of Supervisors Resolution No. 151-2019.</i>	

County and Project Applicant Outreach Efforts with CSDs

County staff contacted both districts in May 2024 to seek input on potential development agreement (DA) terms with each project applicant as it relates to the provision of parks and recreation facilities. The EDHCSD indicated it would not accept parkland that does not have an identified and agreed-upon funding mechanism by annexing into an appropriate community facilities district (CFD) or creating a development-specific CFD (EDHCSD 2024b). The CPCSD requested that the DA address the LRVSP annexing into the CPCSD; impact fees; and development of a maintenance fee for the VMVSP to address demand for services (CPCSD 2024b).

In addition to County staff outreach efforts regarding the DA, the VMVSP and LRVSP project applicants have met with EDHCSD and CPCSD staff to discuss general topics, issues, and concerns regarding the potential park uses and revenue impacts of the projects on existing parks and recreation facilities, beyond those identified in the FIAs and Public Facilities Financing Plans, and

how they might be addressed. Table 10 summarizes those activities. No decisions regarding specific amounts or mechanisms for revenue streams were reached during those meetings.

Date	Participants
August 7, 2024	CPCSD and LRVSP project applicant
August 8, 2024	CPCSD and VMVSP project applicant
August 30, 2024	CPCSD, EDHCSD, and VMVSP project applicant
September 4, 2024	CPCSD, EDHCSD, VMVSP and LRVSP project applicants, County staff
September 12, 2024	EDHCSD and VMVSP project applicant
September 18, 2024	CPCSD and VMVSP and LRVSP project applicants (CPCSD monthly Board of Directors meeting, including presentation by applicants)
December 17, 2024	CPCSD, EDHCSD, VMVSP and LRVSP project applicants, County staff
January 23, 2025	CPCSD, EDHCSD, VMVSP and LRVSP project applicants, County staff

The CPCSD has indicated it would prefer “identifying a mechanism that provides one time funding to improve our facilities to meet the expected increased demand if VMVSP and LRVSP are approved, as well as ongoing funding to address the increased demand on their services” (CPCSD 2024b).

Specific mechanisms and associated funding have not been determined as of October 2024, because the level of detail and forecasting would be speculative based on existing information, and would require additional detailed review and analysis by the two districts and coordination with the project applicants.

With regard to the CPCSD’s comment regarding annexation, the LRVSP project applicant currently proposes to annex into the EDHCSD. However, the project applicant is also considering annexation into the CPCSD. In addition, the CPCSD has expressed interest in possible annexation of the LRVSP into the service area (CPCSD 2024b; LAFCO 2023: 7).

This potential approach would require expansion of the district’s SOI to accommodate the LRVSP, which would require annexation of contiguous property as well because the LRVSP is not contiguous with the current district boundary. Generally, non-contiguous annexations are inconsistent with Local Agency Formation Commission (LAFCO) policy. Annexation would provide for the park use impact fees and the potential to generate revenue through property taxes in the CPCSD as well as an LLAD. However, the Municipal Services Review and Sphere of Influence Study (SOI), adopted by the LAFCO in 2023, stated that “due to the proximity of other special districts in the area ... and CPCSD’s current financial status, LAFCO does not recommend an expansion of the district’s SOI at this time” (LAFCO 2023: 7). At the time the 2023 Municipal Services Review was prepared, the County was still processing the applications for both specific plans. As of February 2025, the County has not taken any action regarding either project. LAFCO, in carrying out its role under the Cortese–Knox–Hertzberg Local Government Reorganization Act of 2000, has the ultimate decision on an application for annexation and the change in boundary for a service area. Documents prepared under the direction of the County, such as EIRs, which have not yet been certified for either project, this assessment, and other items, will help inform LAFCO’s decision making.

An application for annexation cannot be submitted unless and until the County approves the LRVSP and certifies the EIR; thus, annexation, as a potential source of park impact fees and property tax revenue to the CPCSD, cannot be resolved in this study in advance of consideration of the LRVSP by the Planning Commission or Board of Supervisors. If LAFCO ultimately determines that the LRVSP should be annexed to the CPCSD, then the revenues and responsibilities that were projected for the EDHCSD shown in Table 7, above, would be conveyed to the CPCSD upon annexation.

Physical Impacts as Reported in Project DEIRs

The following summary of environmental impacts provided in the DEIRs for both projects is provided for informational purposes. The analyses for each project, in accordance with the California Environmental Quality Act (CEQA), appropriately considered the *physical* impacts on the environment, based on questions included in the CEQA Guidelines Appendix G as to whether a project would: (1) increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; and/or (2) require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. CEQA does not require an evaluation of the potential fiscal impacts of a project in the EIR.

The VMVSP DEIR concluded that because the VMVSP project would establish open space and active recreational opportunities that exceed the parkland dedication requirements of the Quimby Act, the County General Plan, and the EDHCSD, and the CPCSD, implementation of the VMVSP would not be expected to cause or accelerate the deterioration of existing park facilities. This would be a less than significant impact, and no environmental mitigation would be required (ICF 2024b: 3.13-11).

The LRVSP includes an 8-acre Village Park that would be available for public use; the LRVSP also allows for private neighborhood parks. The LRVSP DEIR acknowledged that implementation of the LRVSP would increase the use of neighborhood parks in both district service areas, regardless of the district to which the LRVSP project site is annexed, and concluded that the increased use of existing neighborhood parks and associated physical deterioration due to a lack of adequate parkland within the LRVSP area would be a significant impact (ICF 2024a: 3.13-12). The LRVSP DEIR identified Mitigation Measure REC-1 to reduce impacts to less than significant by designating at least 5.2 acres of private neighborhood parkland in the LRVSP or paying Quimby Act in-lieu fees (ICF 2024a: 3.13-11/12).⁶ The LRVSP DEIR also evaluated whether implementing Mitigation Measure REC-1 could result in significant impacts on such resources as aesthetics, air quality, biology, cultural resources, geology, hazards and hazardous materials, water quality, noise, and transportation. As explained in the DEIR, because the location of any such off-site recreation

⁶ Quimby fees are calculated based on a state standard. Section 120.12.090.C of the El Dorado County Code establishes the process for calculating in-lieu fees, which is calculated by multiplying the amount of land required for dedication by the fair market value per acre of the land proposed for subdivision as established by the County Assessor. The fee collected may only be used for land acquisition and construction of recreation facilities. However, revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities.

facilities has not been determined, and neither the LRVSP nor the EDHCSD identify actual facilities or locations for future projects, precise environmental impacts associated with them would be speculative to address at this time. The actual impacts of new park facilities would depend on the precise type and location of those facilities and would, therefore, be required to undergo project-specific environmental review (ICF 2024a: 3.13-13). Such review would be initiated when a specific site is identified.

The Final EIRs for both projects, which will include responses to comments on the topic of parks and recreation as well as any necessary revisions to the DEIRs in response to comments on this topic and/or County staff-initiated revisions, may contain additional information as it relates to parks and recreational facilities impacts.

SUMMARY

The VMVSP and LRVSP will increase the residential population in El Dorado Hills and Cameron Park. Each project will include public park facilities that would be available to residents within the specific plans, but the parks would also be available to the population outside the project areas. The VMVSP is within the boundary of the EDHCSD, but the LRVSP is not within the service boundary of either the EDHCSD or the CPCSD.

Existing demand on CPCSD and EDHCSD facilities was estimated by the EDHCSD using Placer Labs, Inc. artificial intelligence software platform. The data show that, as expected, most of the demand within each CSD is from residents in those districts, and there is also cross-district use. However, there is a substantial number of visits from the population outside district boundaries (e.g., Folsom and greater Sacramento region and beyond). It is reasonable to assume such trends will continue and that visitors will travel to parks and facilities that best meet their needs, even if there are parks closer to them.

Based on available information, precise quantification of potential future demand on the CPCSD and the EDHCSD park facilities resulting from the VMVSP and the LRVSP is not possible at this time. The reasons for this are:

1. The planned parks in the specific plans would not be designed until tentative maps are submitted, which would only occur upon project approvals, so the specific amenities that would be provided in the planned parks of the specific plans are currently unknown.
2. While the Placer.ai software can be used to generate visitor data for existing conditions, its usefulness for predicting future visits is constrained because the specific plan areas are not developed. There is no “real-time” trip origin and destination visitor trip data.
3. The data indicate cross-district and non-resident use, including a substantial number of visits to the CPCSD and EDHCSD from locations not within the districts. Thus, the projections using the gravity model must be viewed in conjunction with the Placer.ai datasets.

The results of this assessment suggest that there would be a range of potential demand on the CPCSD and EDHCSD from the projects. It is recommended that the project applicants and the two CSDs continue their coordination to potentially develop a more accurate estimate of park and facility demand. This could include engaging local sport user groups to get their input on their willingness to use the planned parks within the specific plans and how that might, in turn, reduce demand in the CSDs. In addition, as with existing conditions, even with increased demand from the projects, both CSDs would retain the ability to control the number of visitors to their facilities for which fees are charged (e.g., for organized sports/club use, swimming pools).

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ATTACHMENTS

Figure 1: EDHCSD and CPCSD Boundaries

Attachment A-1: VMVSP Land Use Map

Attachment A-2: LRVSP Land Use Map

Attachment B-1: VMVSP and LRSVP Park Visitor Estimates for EDHCSD and CPCSD Parks and Recreation Facilities

Attachment B-2: VMVSP and LRVSP Park Visitor Estimates for EDHCSD and CPCSD By Year

Attachment B-3: Visits from Projected Cameron Park Population to Proposed VMVSP and LRVSP Parks

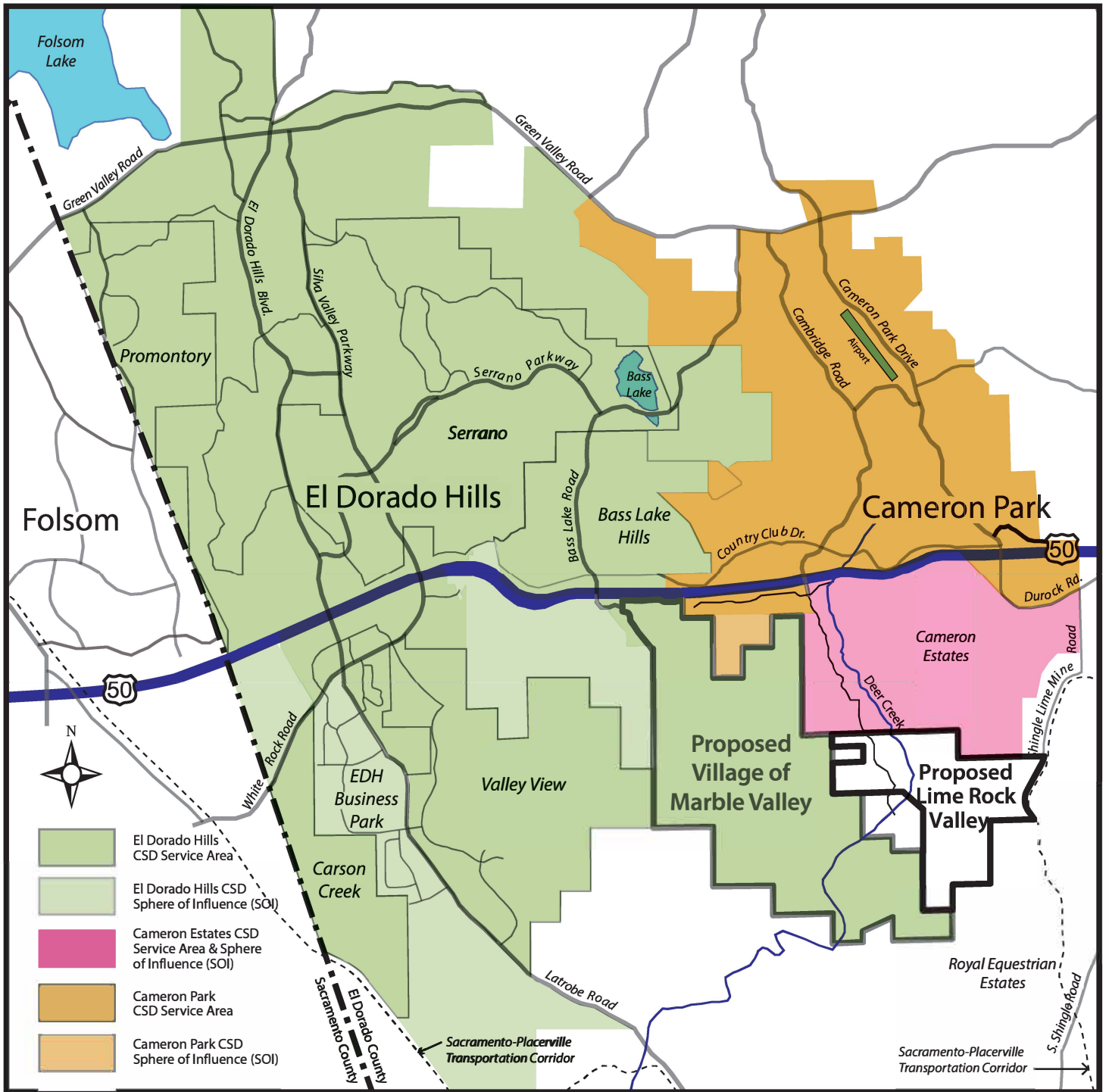
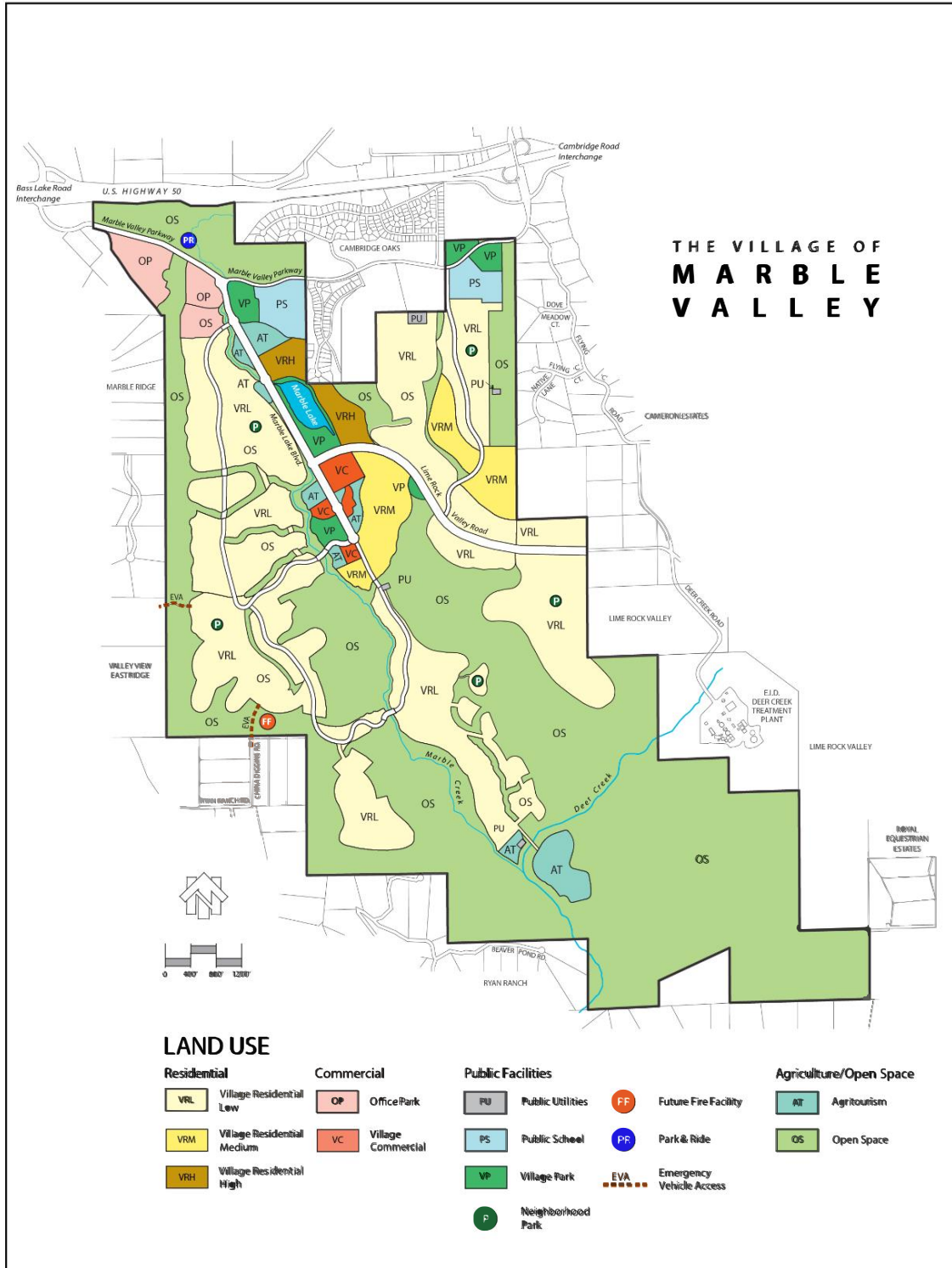
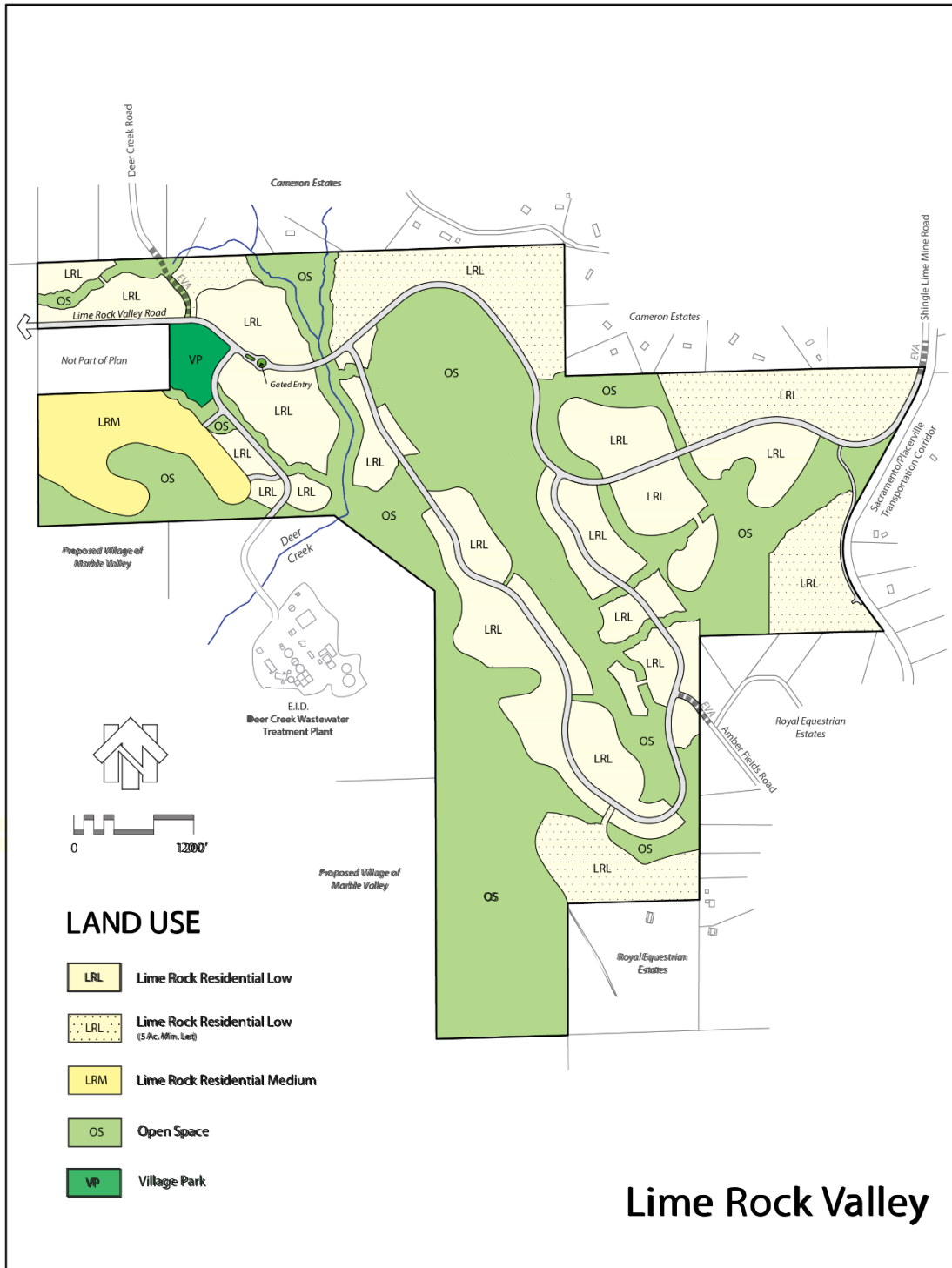


FIGURE 1: EDHCSO AND CPCSD BOUNDARIES





LAND USE

- LRL** Lime Rock Residential Low
- LRL** Lime Rock Residential Low (5 Ac. Min. Lot)
- LRM** Lime Rock Residential Medium
- OS** Open Space
- VP** Village Park

Lime Rock Valley

EDHCS and CPCSD Facilities				VMVSP					LRVSP					Combined Totals						
CPCSD Public Park Facilities ^a	Park/Facility Type	Acres	Address	Travel time	Park	Weighted	Calculated	Total Annual	Percentage of	Projected	Travel	Park	Weighted	Calculated	Total	Percentage of	Projected	Total Annual	Percentage	
				from VMV	Attractive	Force Share	Annual Visits	Visitors	of	Average Park	time from	Attractive	Force Share	Annual Visits-	Annual	LRV residents	Average Park	Visits from	of Visits per	
				(min.)	Force		(buildout)	(buildout)	(buildout)	(buildout)	LRV (min.)	Force		(buildout)	(buildout)	(buildout)	(buildout)	(buildout)	(buildout)	Park
Cameron Park Lake	Community	56.5	2989 Cambridge Rd.	13	118391.82	0.01123858	3,980			10.904	16	22505.9716	0.036782993	3,751			10.28	7,731	33%	
Bonanza Park Disc Golf	Community	12.6	2989 Cambridge Rd.	13	26402.424	0.0025063	888			2.432	16	5019.03084	0.008202933	836			2.29	1,724	7%	
Christa McAuliffe Park	Community	7.1	2400 Merrychase Dr.	9	31040.828	0.00294661	1,043			2.859	12	5027.88275	0.0082174	838			2.30	1,881	8%	
David West Park*	Neighborhood	6.2	4220 Crazy Horse Road	9	27106.075	0.0025731	911			2.496	12	4390.5455	0.007175758	732			2.00	1,643	7%	
Eastwood Park*	Neighborhood	2.2	Culver /Veld Way/Canofa Ln.	13	4609.9471	0.00043761	155			0.425	16	876.338719	0.001432258	146			0.40	301	1%	
Gateway Park	Neighborhood	13.3	Cambridge Rd/Kato Ct.	12	32707.633	0.00310484	1,100			3.012	15	6027.79408	0.009851621	1,005			2.75	2,104	9%	
Paul J. Ryan	Neighborhood	4.9	Cameron Park Dr/Hacienda Road	10	17352.26	0.0016472	583			1.598	13	2956.64144	0.004832234	493			1.35	1,076	5%	
Northview Park*	Neighborhood	5.2	Auburn Hill Dr/Ashland Dr.	13	10896.239	0.00103435	366			1.004	14	2705.43159	0.004421665	451			1.24	817	3%	
Rasmussen Park	Community	10.1	Mira Loma Dr./Catawba Dr.	13	21163.848	0.00200902	711			1.949	16	4023.19139	0.006575367	671			1.84	1,382	6%	
Royal Oaks Park**	Natural area	10.4	Royal Dr./Country Club Dr.	9	45468.255	0.00431617	1,528			4.188	16	4142.69213	0.006770675	690			1.89	2,219	9%	
Community Center	Community	4.1	2502 Country Club Dr.	9	17924.985	0.00170157	603			1.651	12	2903.42525	0.004745259	484			1.33	1,086	5%	
Dunbar Park (site)	Neighborhood	0.9	Green Valley Rd./Hastings Dr.	12	2213.2985	0.0002101	74			0.204	15	407.89584	0.000666651	68			0.19	142	1%	
Knollwood Park (site)	Natural area	6.5	north of Knollwood Dr./Chelsea Rd.	12	15984.933	0.0015174	537			1.472	15	2945.9144	0.004814702	491			1.35	1,028	4%	
Sandpiper Park (site)	Natural area	3.1	between Bass Lake Road and Sandpi	11	9072.6945	0.00086124	305			0.836	14	1612.85345	0.002635993	269			0.74	574	2%	
								12,785	3.6%	35.029					10,924	10.7%	29.93	23,709		
EDHCS Public Park Facilities^b																				
Allan Lindsey Park	Special use	5.5	2150 Armsmere Circle	8	30432.854	0.0028889	1,023			2.803	10	5608.5678	0.009166452	935			2.561	1,958	3%	
Art Weisberg Park	Neighborhood	4.27	2560 Francisco Drive	14	7714.926	0.00073236	259			0.711	17	1506.67408	0.002462457	251			0.688	510	1%	
Bass Lake Regional Park	Special use (Sellwood)	70	3240 Bass Lake Road	8	387327.23	0.03676782	13,021			35.673	11	58993.2	0.096416477	9,832			26.937	22,852	36%	
Blackstone Park	Village	13.6	1881 Blackstone Parkway	15	21405.055	0.00203192	720			1.971	17	4798.77459	0.007842954	800			2.191	1,519	2%	
Bowmens Archery Range	Special use	45	3321 El Dorado Hills Blvd.	11	131700.4	0.01250193	4,427			12.130	13	27152.8296	0.04437766	4,525			12.398	8,953	14%	
Creekside Greens Park*	Neighborhood	1.71	4721 Concordia Drive	10	6055.5846	0.00057484	204			0.558	12	1210.94078	0.00197912	202			0.553	405	1%	
Peter Bertelsen Park (Mitchell Field)	Village park	10.76	831 Redwood Lane	11	31491.03	0.00298935	1,059			2.900	13	6492.54325	0.010611192	1,082			2.965	2,141	3%	
El Dorado Hills Community Park	Community	39.5	1021 Harvard Way	11	115603.69	0.01097391	3,886			10.647	15	17902.0952	0.029258575	2,984			8.174	6,870	11%	
Fairchild Park	Neighborhood	3.84	3045 Brackenwood place	14	6938.0131	0.0006586	233			0.639	17	1354.94812	0.002214481	226			0.619	459	1%	
Governors Park	Neighborhood	1.9	905 Governor Drive	13	3981.3179	0.00037793	134			0.367	17	670.417038	0.001095707	112			0.306	246	0%	
Governors West Park	Open space (undeveloped)	7.3	2780 El Dorado Hills Blvd.	12	17952.31	0.00170416	603			1.653	16	2907.8512	0.004752493	485			1.328	1,088	2%	
Heritage Park	Village park	4.65	4016 Palmdale Drive	13	9743.7518	0.00092495	328			0.897	16	1852.26138	0.003027273	309			0.846	636	1%	
Kalitheia Park	Village park	3.82	4980 Gillette Drive	13	8004.5445	0.00075985	269			0.737	15	1731.29123	0.002829563	289			0.791	558	1%	
Lake Forest Park*	Village park	9.76	1821 Francisco Drive	19	9574.2018	0.00090885	322			0.882	22	2056.3344	0.003360803	343			0.939	665	1%	
Laurel Oaks Park*	Neighborhood	1.66	5031 Whistlers Bend Way	9	7257.4329	0.00068893	244			0.668	12	1175.53315	0.001921251	196			0.537	440	1%	
Murray Homestead Park	Neighborhood	4	3700 Amer Way	14	7227.097	0.00068605	243			0.666	18	1258.93778	0.002057565	210			0.575	453	1%	
New York Creek Nature Trail	Open space	28	2915 Tam O Shanter Dr	12	68858.174	0.0065365	2,315			6.342	16	11153.4019	0.01822874	1,859			5.093	4,174	7%	
Oak Knoll Park & Clubhouse	Village park	2.6	3371 Alyssum Circle	11	7609.3567	0.00072233	256			0.701	13	1568.83015	0.002564043	261			0.716	517	1%	
Overlook Park	Neighborhood	1.18	3273 Kensington Drive	16	1632.3076	0.00015495	55			0.150	19	333.322085	0.00054477	56			0.152	110	0%	
Parkview Heights Park	Neighborhood	1.18	2925 Ridgeview Drive	12	2901.8802	0.00027547	98			0.267	15	534.796768	0.000874054	89			0.244	187	0%	
Promontory Community Park*	Community	18.72	2700 Alexandra Drive	18	20460.715	0.00194227	688			1.884	20	4772.38133	0.007799817	795			2.179	1,483	2%	
Ridgeview Park	Neighborhood	4.35	3449 Ridgeview Drive	13	9115.1226	0.00086527	306			0.839	15	1971.49656	0.003222147	329			0.900	635	1%	
Ridgeview Unit 7 Park	Neighborhood	0.6	3397 Julie Ann Way	14	1084.0645	0.00010291	36			0.100	16	239.001469	0.000390616	40			0.109	76	0%	
Saratoga Park	Village park	2.1	401 Wilson Way	10	7436.6828	0.00070594	250			0.685	13	1267.13205	0.002070957	211			0.579	461	1%	
Stephen Harris Park	Village park	5.71	2740 Tam O Shanter Drive	13	11964.908	0.00113579	402			1.102	17	2014.77962	0.003292887	336			0.920	738	1%	
Valley View Sports Park*	Village park	5	1661 Blackstone Parkway	14	9033.8712	0.00085756	304			0.832	17	1764.25536	0.002883439	294			0.806	598	1%	
Village Green Park	Village park (Serrano)	10	4655 Serrano Parkway	9	43719.476	0.00415016	1,470			4.027	11	8427.6	0.013773782	1,405			3.848	2,874	5%	
Waterford Park	Neighborhood	1.15	2617 Carnelian Circle	17	1409.1589	0.00013377	47			0.130	20	293.175135	0.000479155	49			0.134	96	0%	
Wild Oaks Park*	Open space	10.38	2510 El Dorado Hills Blvd	13	21750.568	0.00206472	731			2.003	16	4134.72541	0.006757654	689			1.888	1,420	2%	
William C 'Bill' McCabe Park	Neighborhood	4.74	2590 Hoffman Court	14	8564.1099	0.00081297	288			0.789	17	1672.51408	0.0027335	279			0.764	567	1%	
Windsor Point Park	Neighborhood	1.14	4005 Windsor Point Place	17	1396.9053	0.0001326	47			0.129	20	290.625786	0.000474989	48			0.133	95	0%	
								34,267	9.7%	93.881					29,518	28.9%	80.871	63,785		
Village of Marble Valley Specific Plan^c																				
		Proposed																		
		Acres																		
Proposed park sites (see exhibit)																				
VP 1 and VP 2 (Marble Lake Park)		21	Marble Lake Blvd.	1	7436682.8	0.70594221	249,994			684.914	5	85658.1264	0.139996724	14,276			39.112			
VP 3		8	Marble Valley Parkway/Marble Lake B	2	708255.5	0.06723259	23,809			65.230	7	16648.8098	0.027210248	2,775			7.602			
VP 4		6	Marble Valley Parkway	5	84990.66	0.00806791	2,857			7.828	5	24473.7504	0.039999064	4,079			11.175			
VP 5		6	Marble Lake Blvd.	2	531191.63	0.05042444	17,857			48.922	6	16995.66	0.027777128	2,833			7.760			
VP 6		1.5	Lime Rock Valley Road	2	132797.91	0.01260611	4,464			12.231	7	3121.65184	0.005101921	520			1.425			
VP 7		4.5	Marble Valley Parkway	5	63742.995	0.00605093	2,143			5.871	5	18355.3128	0.029999298	3,059			8.381			
Total public parks per VMVSP		47								301,123							27,542		27.0%	75.456
Lime Rock Valley Specific Plan^d																				
Village Park 1 (public)		8	Lime Rock Valley Road	4	177063.88	0.01680815	5,952	5,952	1.7%	16.307	2	203947.92	0.333325533	33,991	33,991	33.3%	93.12			
					10534407	1	354,128	354,128	1			611858.078	1							

Annual Park Visits		VMVSP	LRVSP
Projected Park Users ^e		9,168	2,640
	Park visit per		
Frequency	person	Annual Visits	Annual Visits
2 or more times per week	0.167	238,845	68,777
Once per week	0.138	65,790	18,945
Once or twice per month	0.206	33,995	9,789
Several times per year	0.244	13,422	3,865
Once or twice per year	0.151	2,077	598
Total Annual Visits		354,128	101,974
Annual Visits by Resident		38.6265	38.6265

Notes:

* Lighting and Landscape District (LLAD)

** As of 2025, only the walking trail is accessible.

Sources:

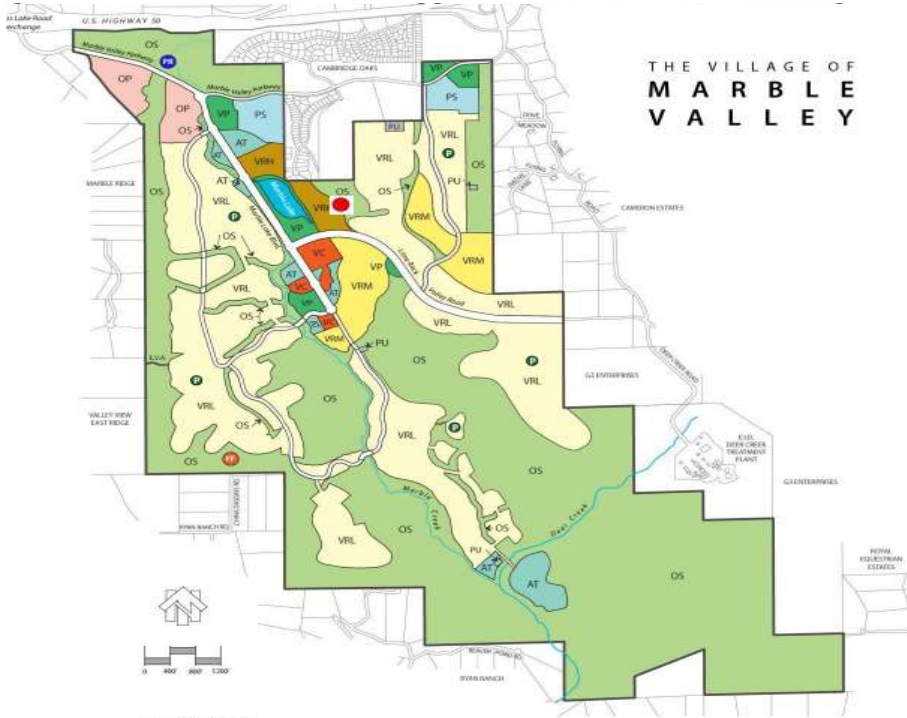
a CPCSD 2014; CPCSD "Our Parks" (<https://www.cameronpark.org/our-parks>); * denotes LLAD

b EDHCS 2024: Appendix E; EDHCS Park Locator (https://www.eldoradohillscsd.org/programs_and_amp_activities/parks.php) * denotes LLAD

c Marble Valley Company LLC, VMVSP Public Review Draft 2024

d Lime Rock Valley LLC, LRVSP Public Review Draft 2024

e VMVSP and LRVSP Draft EIRs, May 2024, Sections 3.13.



denotes the population "centroid" i.e., the point from which travel time to park sites is measured on Google Maps

Park Visitor Demand Methodology for VMVSP and LRVSP

Park impacts, in terms of potential park visitors from the Village of Marble Valley Specific Plan (VMVSP) and Lime Rock Village Specific Plan (LRVSP) on the parks operated by the El Dorado Hills Community Services District (EDHCSD) and Cameron Park Community Services District (CPCSD), were estimated using a gravity model that measures the relative attraction between two entities based on the physical characteristics of the entities.

The gravity model is of the form:

$$A=M_1M_2/d^2, \text{ where:}$$

A is the attraction between the two entities.

M_1 and M_2 are the characteristics of the first and the second entity, respectively.

d is the distance between the entities.

The model states that the attraction between two entities is proportional to the product of the M values of the two entities and inversely proportional to the square of the distance between the two. A gravity model is widely used in estimating the relative attraction of shoppers within a given study area to local shopping centers.¹ The gravity model was used as a reasonable proxy for estimating park visitors because the inputs can be expressed as population, acreage, and travel time.

In the analysis, the value of A is the relative attraction of a given park site to a residential area. The characteristic of the residential area is the number of annual park users, the park characteristic is the park's acreage, and d is the vehicle travel-time in minutes between the residential area and the park.

The model assumes that when given multiple park options, a park user will decide where to go based on park amenities and facilities and the travel time to the park. Acreage is the most general park characteristic and is used as a proxy for the amenities and recreation facilities at a given park. For example, the larger the park, the more likely it is to offer more recreational opportunities for any given park user. While single-use parks will have a high attraction to a specific set of users—e.g., a dog park has a high attraction to someone who wants to exercise their dog—among the entire set of park users, their attraction relative to other parks is small.

The residential characteristic is the number of park visitors that are expected to be generated by the projects' populations. In this analysis, the park users, as a percentage of the total population, were derived from a survey conducted by California State Parks.²

¹ In the gravity model, M_1 can be population, households, or disposal income; M_2 can be retail floor area (or acreage) and expressed as either distance or travel time.

² *Survey on Public Opinions and Attitudes on Outdoor Recreation in California* for the State Comprehensive Outdoor Recreation Plan (2014) <https://www.parks.ca.gov/pages/795/files/2012%20spoa.pdf>

Park Visitor Demand Methodology for VMVSP and LRVSP

The park user percentages in the study were reported as follows:

Frequency of park visit	Percentage of respondents	Annual visits by any given project resident
2 or more times per week	16.7%	$3 \times 52 \times 16.7\% = 26$
Once per week	13.8%	$1 \times 52 \times 13.8\% = 7.2$
Once or twice per month	20.6%	$1.5 \times 12 \times 20.6\% = 3.7$
Several times per year	24.4%	$6 \times 24.4\% = 1.5$
Once or twice per year	15.1%	$1.5 \times 15.1\% = 0.23$
Total park visits by the average project resident		38.63

Travel Time to Parks

Google Maps was used to determine the travel time in minutes for the existing parks in the EDHCSD and the CPCSD, and the proposed parks in VMVSP and in LRVSP. The starting point for each park trip is given as the centroid of the projects' populations determined from the project specific plans. For the VMVSP, this is near the proposed intersection of Marble Lake Boulevard and Lime Rock Valley Road. The LRVSP centroid is the intersection of Lime Rock Valley Road and the proposed main loop road. The park address was entered as the destination on Google Maps and the shortest travel time was recorded.

Proportional Attraction by Individual Park

The total park visitors, park acreage, and travel time to each park are used in the gravity model formula to calculate each park's attractiveness value. The attractiveness factor depends on two variables: travel time and acreage. Each attractiveness value is then divided by the sum of all attractiveness values to find each park's attractiveness relative to all other parks in the study, which is then multiplied by each projects' total park visitors to find the number of visitors annually to that park from the VMVSP and LRVSP.

VMVSP													LRVSP									
Year	Condo (MFR) Units	Apt (MFR) Units	MFR units (total) ^a	SFR units ^a	Population ^b	Units/year (%) ^c	Annual visits to EDHCSD ^d	Cumulative visits to EDHCSD/year	Daily visits to EDHCSD	Annual visits to CPCSD ^e	Cumulative visits to CPCSD/year	Daily visits to CPCSD	Year	SFR units ^a	Population	Units/year (%) ^c	Annual visits to EDHCSD ^d	Daily visits to EDHCSD	Cumulative visits to EDHCSD/year	Annual visits to CPCSD ^e	Cumulative visits to CPCSD/year	Daily visits to CPCSD
1	0	0	0	0									1	51	168	6%	1,650	5				
2	51		51	110	470	5%	1,760		5	653		5	2	51	168	6%	1,650	5	3,000	1,410	2,819	4
3	51	63	114	110	602	7%	2,256	4,016	6	837	1,490	6	3	51	168	6%	1,650	5	4,950	1,410	4,229	4
4	51	63	114	110	602	7%	2,256	6,271	6	837	2,327	6	4	51	168	6%	1,650	5	6,600	1,410	5,639	4
5	51		51	110	470	5%	1,760	8,031	5	653	2,981	5	5	51	168	6%	1,650	5	8,250	1,410	7,049	4
6	51		51	110	470	5%	1,760	9,791	5	653	3,634	5	6	51	168	6%	1,650	5	9,900	1,410	8,458	4
7	51		51	110	470	5%	1,760	11,552	5	653	4,287	5	7	50	165	6%	1,618	4	11,518	1,382	9,840	4
8	51	76	127	110	630	7%	2,358	13,909	6	875	5,162	6	8	50	165	6%	1,618	4	13,136	1,382	11,222	4
9	51	76	127	110	630	7%	2,358	16,267	6	875	6,037	6	9	50	165	6%	1,618	4	14,754	1,382	12,605	4
10	51		51	110	470	5%	1,760	18,027	5	653	6,691	5	10	50	165	6%	1,618	4	16,371	1,382	13,987	4
11	51	63	114	110	602	7%	2,256	20,283	6	837	7,528	6	11	49	162	6%	1,585	4	17,957	1,354	15,341	4
12	51	63	114	110	602	7%	2,256	22,538	6	837	8,365	6	12	49	162	6%	1,585	4	19,542	1,354	16,695	4
13	51	75	126	110	628	7%	2,350	24,888	6	872	9,237	6	13	49	162	6%	1,585	4	21,128	1,354	18,050	4
14	35	72	107	110	588	6%	2,200	27,089	6	817	10,053	6	14	49	162	6%	1,585	4	22,713	1,354	19,404	4
15			0	110	363	4%	1,359	28,448	4	504	10,558	4	15	49	162	6%	1,585	4	24,298	1,354	20,759	4
16			0	110	363	4%	1,359	29,807	4	504	11,062	4	16	49	162	6%	1,585	4	25,884	1,354	22,113	4
17			0	105	347	4%	1,297	31,104	4	481	11,544	4										
18	42		42	104	431	5%	1,615	32,719	4	599	12,143	4										
19	33		33	104	413	5%	1,544	34,264	4	573	12,717	4										

Notes:

a Units per year assumption per LRV DEIR (ICF 2024a: Appendix C) and VMVSP DEIR (ICF 2024b: Appendix C)

b Calculated as 3.3 people/SFR unit and 2.1 people/MRF unit per LRVSP DEIR and VMVSP DEIR Section 3.13 (Recreation)

c Calculated as follows: number of units per year/total buildout units

d Calculated as follows: population x 38.6 park visits/day per Attachment B-1 x 9.7 % of residents going to EDHCSD per Attachment B-1

e Calculated as follows: population x 38.6 park visits/day per Attachment B-1 x 3.6 % of residents going to CPCSD per Attachment B-1

f Calculated as follows: population x 38.6 park visits/day per Attachment B-1 x 25.4 % of residents going to EDHCSD per Attachment B-1

g Calculated as follows: population x 38.6 park visits/day per Attachment B-1 x 21.7% of residents going to CPCSD per Attachment B-1

**Visits from Projected Cameron Park Population
to Proposed VMVSP and LRVSP Parks**

Proposed Park Facilities	Acres	Address	Annual Visits From Projected Cameron Park Population to Parks Proposed in VMVSP and LRVSP (Buildout)
Village of Marble Valley			
VP 1 and VP 2 (Marble Lake Park)	21	Marble Lake Blvd.	
VP 3	8	Marble Valley Parkway/Marble Lake Blvd.	
VP 4	6	Marble Valley Parkway	
VP 5	6	Marble Lake Blvd.	
VP 6	1.5	Lime Rock Valley Road	
VP 7	4.5	Marble Valley Parkway	
Total Parks Acres per VMVSP	47		19,240
Lime Rock Valley			
Village Park 1	8	Lime Rock Valley Road (1332 Deer Creek Rd.)	4,940

Appendix D

Memorandum in Response to Lotusland Case



Memorandum in Response to *Lotusland* Case
March 26, 2025

Introduction and Overview

The Draft Environmental Impact Report (“DEIR”) for the Village of Marble Valley Specific Plan (“project” or “VMVSP”) analyzed the risk of exposure from wildland fires. The DEIR explains that “[s]everal factors contribute to the susceptibility of wildfire danger in the county, [and]. . . [i]ntroducing construction activities, electrical service structures, and people to this area would expose them and the surrounding community to potential wildfire risk.” (DEIR at p. 3.7-20.) The DEIR explained: “With the additional identified protection and required wildland fire protection features, the project would protect residents from significant wildfire risks and would not increase or create new risks. The proposed project would not expose people or structures to a significant risk of loss, injury, or death, either directly or indirectly, due to a wildland fire as a result of the fuel modifications and defensible space development.” (DEIR at p. 3.7-22.) The DEIR ultimately concluded that Mitigation Measure HAZ-8 and the state, El Dorado County Fire Protection District, El Dorado Hills Fire Department, and VMVSP requirements and standards would minimize the potential for wildfire and would not result in substantially greater potential to exacerbate existing wildfire hazards in the project area. (DEIR at p. 3.7.-24.)

After circulation of the DEIR, the undersigned and applicant provided memoranda responding to comments regarding wildfire risks for the project, including the September 3, 2024 Wildfire Master Response from Firesafe Planning, Inc. and the September 6, 2024 response from the applicant (collectively, “Applicant Responses to Comments”).

The purpose of this memorandum is to respond to the October 23, 2024 decision in *People of the State of California Ex Rel. Rob Bonta, Attorney General v. County of Lake & Lotusland Investment Holdings, Inc.* (2024) 105 Cal.App.5th 1222 (“*Lotusland*”). In *Lotusland*, the appellate court faulted the EIR for not explaining the extent to which bringing new residents to the largely undeveloped project site would increase the “risk of human-caused wildfire over the existing baseline risk.” (*Id.* at p. 1233.) The court also explained that if quantifying the risk is not possible, the “EIR itself must explain why, in a manner reasonably calculated to inform the public of the scope of what is and is not yet known about the Project’s impacts.” (*Id.* at fn. 8.)

While the DEIR for the VMVSP explained that most wildfires are caused by people and increasing people in the area would expose those new residents and the surrounding community to potential wildfire risk, the DEIR did not, as in *Lotusland*, attempt to quantify the increased risk of human-caused wildfires as a result of the increased population from development of the project.

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The following analysis therefore strives to assess the risk from adding the new project population to the undeveloped project site and concludes that, while the project increases the general potential for human-ignited wildfires as disclosed in the DEIR, there is not a direct or linear correlation between increased population and wildfire that can be precisely calculated. Studies have determined that, at a certain point, increased density in terms of units per acre and population combined with development under current standards begins to actually minimize the risks of wildfires even though the population has increased. Moreover, studies have also shown that construction under current standards reduces the threat of wildfire and communities built after 2008 face less wildfire risk. The *Wildland Fire Evacuation Risk Report - Fire Behavior - The Village of Marble Valley Project* prepared by Firesafe Planning, Inc. dated October 24, 2023 in Appendix M of the DEIR also explains how the mandatory risk reduction measures for the Project, including built-in fire protection features (e.g., defensible space, fuel modification, hardening of the structures, and required maintenance), result in the Project actually decreasing the risk of wildfire for the surrounding communities. Therefore, while there is an increased risk of fires caused by humans when new populations are brought to an undeveloped area that otherwise does not have people, historical data, regulatory compliance, and project design and mitigation measures, demonstrate that the risk from the addition of people to the proposed project will remain less than significant.

Analysis

It is important to first strive to quantify the increased risk that may be caused by development in areas which have not been previously developed. This needs to be done by describing the “additional wildfire risk factors as compared to existing conditions” that the project would “introduce” to the area. Specific studies for the project site region on this subject are not readily available, however, more regional, national and international findings are available on the general subject.

The introduction of new residents to the largely undeveloped project site increases the risk of human-caused wildfire over the existing baseline risk due to the lack of people at the project site. As the DEIR explains, “the majority of wildland fires that have occurred in the Western El Dorado County area are human caused.” (DEIR at p. 3.7-11.) Humans cause nearly 90% of wildfires in the United States according to the latest report from the Congressional Research Service in its report on Wildfire Statistic data June 1, 2023. These fires are primarily from discarded cigarettes, unattended campfires, burning debris, or through equipment malfunctions. By bringing people to an undeveloped area, these risks of human-caused fires would increase.

Increased human habitation in a wildlife-urban interface increases the fire risk from human activities such as arson, children playing with fire, debris-burning, increased vehicular traffic, increased fire risk from sparks, catalytic converters, and smoking/discarded smoking materials and accidental fires. The development itself introduces residences within the site creating a wildland-urban interface that increases the general potential for human-ignited wildfires. All of these factors could expose project occupants to pollutant concentrations from wildfire or the uncontrolled spread of wildfire near or into the development footprint.

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However, as noted in the publication, *Conservation Threats Due to Human-Caused Increases in Fire Frequency in Mediterranean-Climate Ecosystems*, by Alexandra D. Syphard, et. Al (May 2009), while “human ignitions increase with population density, . . . there appears to be a threshold above which fire occurrence declines, possibly due to less open space and fuel fragmentation caused by urban development or other land-use change”:

The association of people with the spatial distribution of fire occurrence is likely due to the fact that humans now cause the majority of ignitions in all five Mediterranean-climate regions (Bond & van Wilgen 1996), and human ignitions are likely to occur close to roads and human infrastructure (e.g., Yang et al. 2007; Syphard et al. 2008). Nevertheless, our results also showed that fire occurrence consistently peaked where population densities were intermediate, which suggests that fire patterns in Mediterranean-climate regions are related to the spatial arrangement between people, urban development, and fuel. When population density is lowest, human ignitions are also low but increase with population density. Nevertheless, there appears to be a threshold above which fire occurrence declines, possibly due to less open space and fuel fragmentation caused by urban development or other land-use change. Fire-suppression resources also tend to be concentrated near urban areas (Calkin et al. 2005), and intermediate-density housing when located within wildland vegetation is classified as the wildland–urban interface (WUI) in the United States and given special fire-management considerations (Radeloff et al. 2005).

Conservation Threats Due to Human-Caused Increases in Fire Frequency in Mediterranean-Climate Ecosystems, Alexandra D. Syphard, Volker C. Radeloff, Todd J. Hawbaker, Susan I. Stewart, First published: 15 May 2009, <https://doi.org/10.1111/j.1523-1739.2009.01223>

Therefore, while the increased probability of human-caused ignitions cannot be ignored, the reality is that while more opportunities for fires will exist, factors associated with the changes in the wildland fuels and topography will have an offsetting effect:

*Studies in California show that area burned and number of fires are highest when population and housing densities are intermediate (Keeley 2005; Syphard et al. 2007). Fires initially increase with population and housing density and then decline where a threshold density is reached. There are several interrelated reasons for this. Ninety-five percent of California’s fires are human caused; therefore, anthropogenic ignitions are lower in areas with low population density. As population and housing densities increase, fuels are still abundant and contiguous enough to carry fire, and the number and frequency of fires increase (Syphard et al. 2007). As population density increases further and an area is developed, wildland fuel is reduced and fragmented and fire-suppression resources are concentrated, resulting in lower fire frequencies at high population densities. Finally, even if fire frequency remains stable, fires may cluster in certain areas (e.g., human settlements) or land-cover types (Nunes et al. 2005; Forsyth & van Wilgen 2008), resulting in high fire frequency in localized areas. Syphard, A. D., Radeloff, V. C., Hawbaker, T. J., & Stewart, S. I. (2009). Conservation threats due to human-caused increases in fire frequency in Mediterranean-climate ecosystems. *Conservation Biology*, 23(3), 758–769.*

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As the above studies highlight, increased density can reduce the severity of wildfires for numerous reasons. One avenue that increased density reduces wildfire severity is the increase in density of the units per acre because increased density in units per acre reduces vegetation between residences and provides shorter distances between structures. Chapter 49 of the Fire Code does not allow tree canopies to be within 10 feet of a structure or shrub groups within 30 feet of a structure, thus as the structures are placed closer together, the vegetation limits and noncombustible areas of each structure begin to merge and thereby preclude the use of trees and shrubs between the structures. For example, at approximately 6 dwelling units per acre, it is unlikely trees could be planted between the structures and, at approximately 8 dwelling units per acre, it is unlikely trees could be planted between the structures or in the backyards of the structures. In contrast, when densities are lower (approximately 2.0 du/ac or less depending on layout) the distance between the structures is generally greater than the prescribed defensible space (100 feet in California) around the structure. While these structures will be subject to the same limitations under current standards regarding trees and vegetation, the limitations around each structure are unlikely to overlap and thus trees and vegetation are likely to occur between the structures.

The benefits of increased density are not limited to units per acre, however, and are also seen through increased population density in communities designed and built to current standards. For example, even when dwelling units per acre are lower, the severity of fires is decreased due to numerous benefits that an increase in population density brings to formerly undeveloped land with wildland fuels. These benefits included the addition of new roads, firebreaks, and fire resources to a currently undeveloped and potentially inaccessible area and development of the homes under current standards with mandatory hardening of structures, fire sprinklers, and vegetation management.

Therefore, the benefits of increased density in minimizing the risks of wildfires are not limited to considering the units per acre, but extend to the addition of development under current standards with improved firefighting resources and infrastructure in a previously undeveloped area. All of these factors will reduce the risks of wildfire severity and spread independent of the dwelling units per acre. A community design approach with long-term enforcement through an HOA, as with VMVSP, further reduces the severity of wildfires. In assessing the benefits of density, one consideration thus cannot be examined in isolation of the others to quantify an ideal dwelling units per acre because all of the factors work together to create a system's approach that reduces both wildfire risk and severity. What can be said at a broader level, however, is that the increased density in terms of both units per acre and population can reduce the wildfire severity when, as with the VMVSP, the entire community is designed to anticipate wildfire risks and implements the most current wildland interface code and regulations.

A study out of Texas (*Effects of changing development patterns and ignition locations within Central Texas*, Mobley, W, (Feb. 2019)) also indicated the ignition gradient along lateral development could lower ignition probabilities when the new development areas were nearest to the previous urban development, while outlying development patterns in the wildland had higher probabilities.

This builds on the concept that, at a point of development density in terms of units per acre and population, wildland fuels are reduced/eliminated or fragmented to a point where fire suppression

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effort is more effective. This higher level of development also has a greater concentration of emergency services resources to aid the protective actions needed to bring the incident to a close.

According to the Western Fire Chiefs Association (WFCA), wildland fires are primarily from discarded cigarettes, unattended campfires, burning debris, or through equipment malfunctions. Using data from El Dorado County Fire Agencies, 88 fires over 10 years (2012-2022) provided the following breakdown for those fires where the cause was known (61 fires):

14	23.0%	Equipment Use
13	21.3%	Miscellaneous
9	14.8%	Debris/Trash burning
7	11.5%	Arson
6	9.8%	Lightning
6	9.8%	Vehicle
3	4.9%	Powerline
2	3.3%	Smoking
1	1.6%	Campfire
<hr/>		
61		

Restricting smoking in open space areas coupled with roadside protection zones is greatly beneficial to reducing the impacts of smoking materials within any project site. Campfires will not be allowed within the project site nor will solid-fuel appliances or open flame devices which do not have spark arrestors in accordance with the Fire Code and local ordinance requirements. Burning of debris will not be allowed within the project site and will be enforced by the project site HOA in addition to the local law enforcement and fire agencies. While it is impossible to stop all of the equipment malfunctions, the wildfire safety plan for the proposed project will be required to comply with the most current regulations and standards regarding the type and nature of equipment used in or near the wildland interface. Internal combustion engines are required to have spark arrestors under the current fire code. The common areas of the project site will be under the jurisdiction of the HOA and as such, it can and will hold those doing work in the interface, especially the fuel modification zones, accountable for wildland fire safety practices in accordance with CalFire/Local Fire agency and NFPA (Nation Fire Protection Association) standards as also implemented through the wildfire safety plan required under HAZ-8.

A study out of Canada summed the relationship of population to increased wildland fire ignitions up very well:

The prevalence of human-caused wildfires near population centers and in interface areas is not just a Canadian phenomenon, but has been observed all over the world. However, the relationship between human population density and wildland fire is complex and has been shown to be non-linear in many regions across the world because population centers can offer both sources of ignition and enhanced protection from wildland fire spread owing to increased suppression activity (Bistinas et al. 2013; Price and Bradstock 2014).

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In such cases, the incidence of wild land fire ignitions increases with population density up to a local threshold, then decreases. In their research, they found that population centers of all sizes were associated with individual clusters, which further supports the notion that the relationships between human-caused wildfires and population density are non-linear and involve other factors.

Human- and lightning-caused wildland fire ignition clusters in British Columbia, Canada

Sean C. P. Coogan A *, Olivia Aftergood A and Mike D. Flannigan B., International Journal of Wildland Fire 1043-1055 <https://doi.org/10.1071/WF21177> Published: 11 October 2022

For the project site, proposed density levels will create conditions which are favorable to reduced impacts from wildland fires such as a new fire station, fuel modification zones which are placed in a “system’s approach” rather than lot by lot, roadside clearance to reduce ignitions from discarded smoking materials and vehicle accidents, increased access to wildland areas from road network with multiple points of access and interties to existing circulation roadways which do not currently connect and earlier detection of incipient fires. All of these will have a positive impact on any wildland fire ignitions. These protections, already in place in newer adjacent developments, are likely the reason for limited increases in wildland fires in the general area when the population has increased significantly, as discussed more below.

Overall, while data regarding the causes of fires is important in mitigating the risks of human-caused fires, the data does not indicate that the population increase from the VMVSP will increase the number or acres of wildland fires in a linear manner that is tied to the population increase. Examination of wildland fires illustrates this at both a statewide and local level.

Statewide Data

The total number of structures in or near the WUI (Wildland Urban Interface) has increased significantly over the past few decades. If the probability of ignition was increased in a linear manner by the increase in population, it could be assumed that the number of wildland fires would have increased over the same period as well. The opposite has occurred. According the CalFire database (<https://www.frontlinewildfire.com/wildfire-news-and-resources/california-wildfires-history-statistics/>), the number of wildland fires is trending down over the past 37 years (Figure 1).

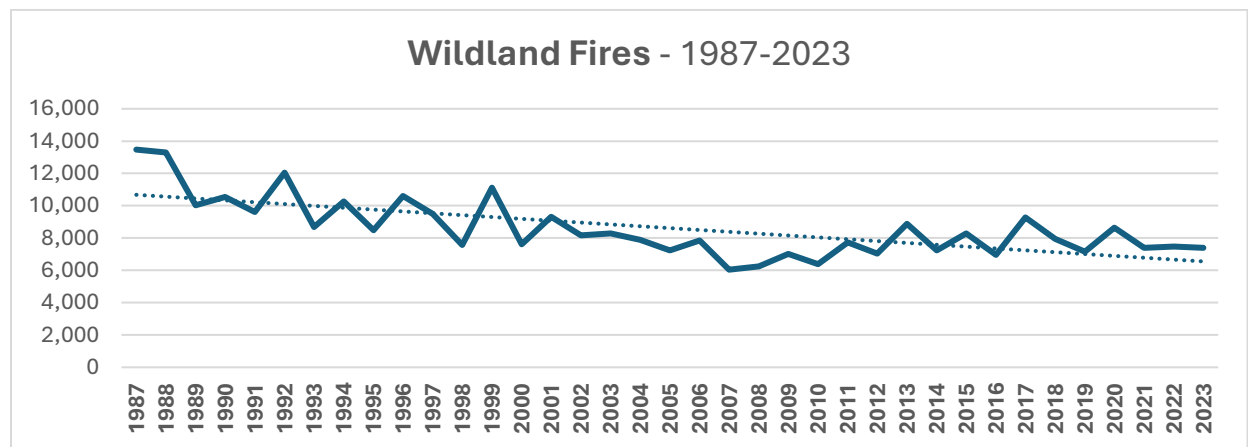


Figure 1 – California Wildland Fires 1987 to 2023

In the same time period (1987-2023) the population of California increased from 27,777,160 to 38,965,193(40% increase). While not all of this increase was in the WUI, a large portion of the

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new development areas within California are in the WUI. While the number of fires has decreased, the acreage burned has increased, in some years dramatically. This is illustrated in Figure 2, below.

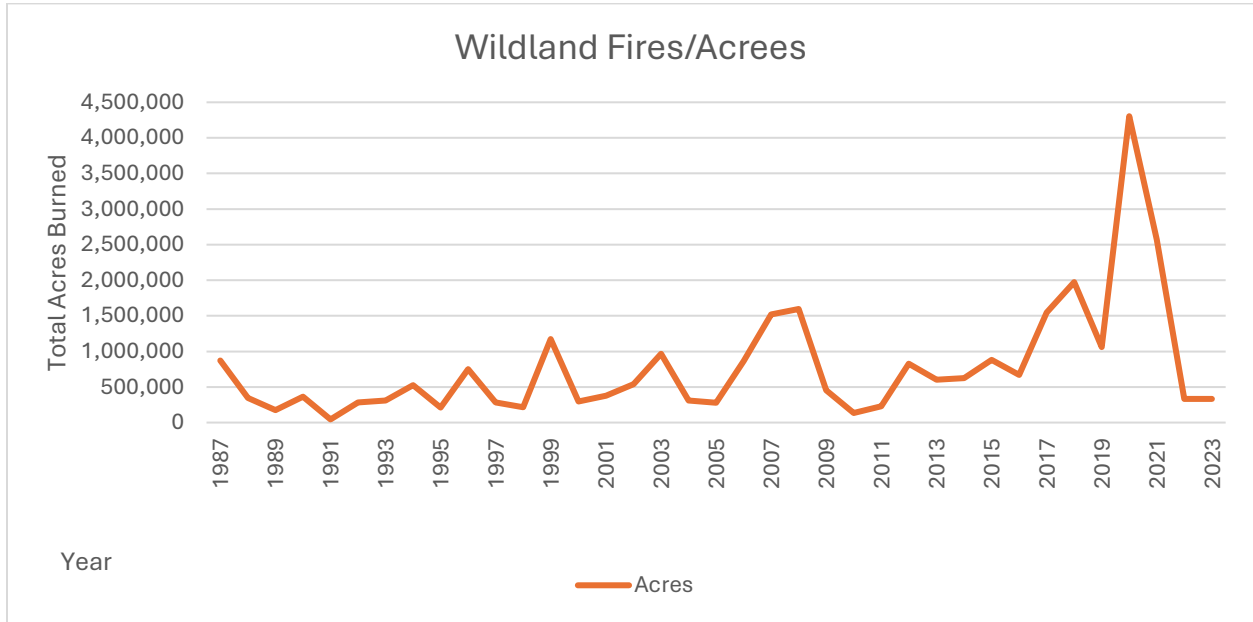


Figure 2 - California Wildland Acreage 1987 to 2023

Figure 3, below, provides the two charts on the same graphic.

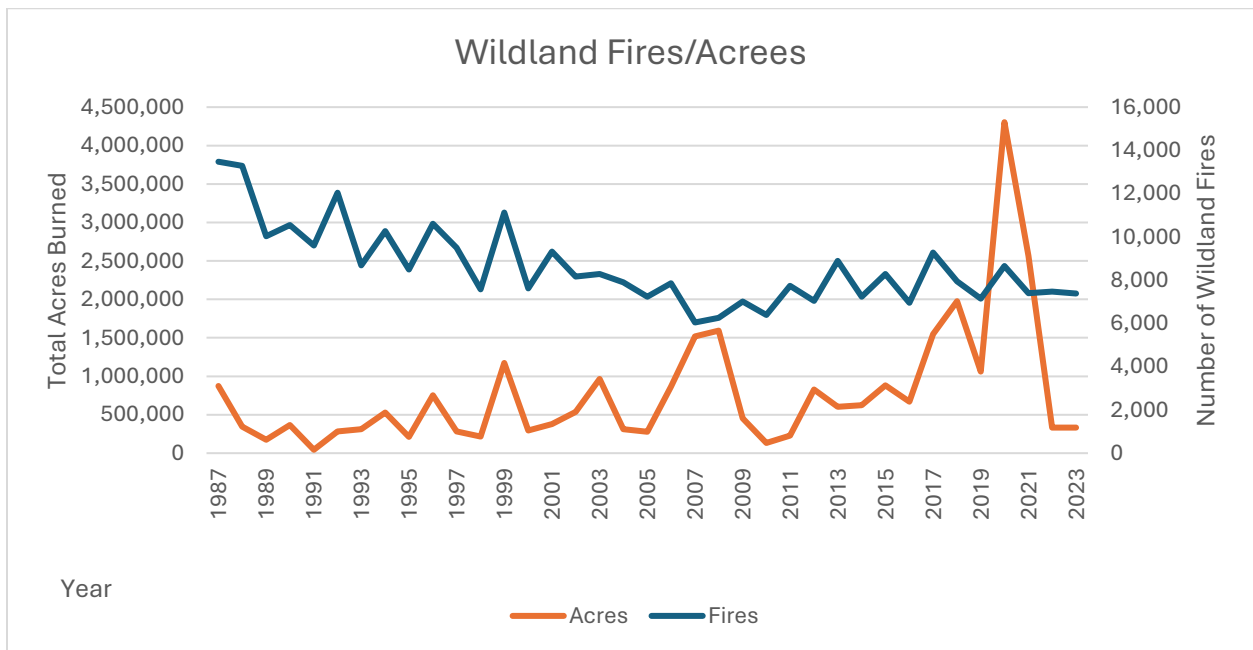


Figure 3 – California Wildland Fires vs Acreage 1987 to 2023

Research done on wildland fire in the Sierra Nevada’s from 1984 to 2017 indicates that “human activities” and land use alter the wildfire regime. This occurs through ignitions (deliberate or accidental), suppression of the fires, and altering of the wildland fuels, including vegetation

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treatments, prescribed fire, forest clearing, and cultivation. Fuel continuity is also affected which leads to a fragmentation of the landscape. (Chin, B 2021)

The 2021 research article indicates that “populations living in the wildland-urban interface increases road and trail density and traffic (Radeloff et al., 2018) and Syphard et al. (2007) found a highly significant relationship between fire frequency and indices of human settlement such as population density and distance to WUI at the county level in California. It concluded that the structure of human development in the WUI and the interaction with vegetation are important risk factors for fire. (Chin, B 2021)

An important point made in the 2021 study is that “Areas of interface WUI, where development is adjacent to wildland vegetation, have a lower fire probability than areas of intermix WUI, where development is intermingled with wildland vegetation.” (Haight et al., 2004; Syphard et al., 2007).

Another salient point made by the study indicates that “Increases in electrical infrastructure and transmission lines with WUI expansion create further ignition risk, especially under extreme weather conditions.” (Calkin et al., 2014; San-Miguel-Ayanz et al., 2013). When new development undergrounds its utilities, as planned for the proposed project, this aspect of the increased risk is mitigated to a point where it is no longer an issue.

While it is impossible to isolate the WUI factors within the myriad of issues which drive the number of wildland fires in a year, it is possible to say that the inclusion of a large amount of new residential population into the WUI over this period has not produced a significant increase in the number of wildland fires. Correlation is not causation, and this is not presented as proof, but the correlation is one factor to consider.

Within the CalFire Fire and Resource Assessment Program (FRAP) database is a repository of all of the known fire perimeters which have been collect over the years. FRAP annually maintains and distributes a historical fire perimeter data set from across public and private lands in California. The GIS data is jointly developed with the cooperation of the United States Forest Service Region 5, the Bureau of Land Management, the National Park Service and the Fish and Wildlife Service and is released in April of each year. The database represents the most complete digital record of fire perimeters in California, but it is still incomplete, and one should be so advised when drawing conclusions based on the data.

The fire perimeters database has a total of 241 fire perimeters from 1950 to 2023 for El Dorado County. A total of 182 of those fires have occurred since 1970 and 121 of them since the year 2000 (Figure 4). When grouped by decade, the data shows that, while the 2000’s had more fire starts, the number of acres burned was significantly less than the decade before (1990’s) in spite of over twice the number of fires (61 vs 28). The current decade has a single fire (Caldor) which accounts for 74% of the total acres burned for the decade (221,786 acres /300,516 acres). The 2020 decade has only 4 years of data and is not directly comparable. Since 1970, the population of El Dorado County has increased from 43,833 to a current population of 192,215 according to Census data (Current Population Reports, Series P25-1106). This is an increase of 439% or 4.39 times the number of residents in 1970 vs today. If there was a direct correlation between the

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number of residents and the number of wildland fires in 2019, by the end of the 2010 decade the number of fires should have been 79 (18 times 4.39) but it is not.

Decade	Fires	Avg/Yr	Acres	Population (Avg/Decade)	Percent Increase	per capita	per 1,000	ac per cap
1950	30	3	58,429.9	16,207		0.00185	1.85	3.61
1960	29	2.9	81,444.8	29,390		0.00099	0.99	2.77
1970	18	1.8	42,854.0	58,893		0.00031	0.31	0.73
1980	15	1.5	8,059.0	99,632	169%	0.00015	0.15	0.08
1990	28	2.8	35,154.9	142,614	242%	0.00020	0.20	0.25
2000	61	6.1	26,297.7	168,836	287%	0.00036	0.36	0.16
2010	45	4.5	115,579.0	183,102	311%	0.00025	0.25	0.63
2020	15	1.5	300,516.0	192,439	327%	0.00008	0.08	1.56
	182		528,460.6					

Figure 4 – FRAP Database Summary

Regional Data

In El Dorado County, the population has increased from approximately 44,000 in 1970 to a current population of 192,000 (2023 Intercensal Estimates of the Resident Population of States and Counties), which is an increase of 436% with most of that increase in the western part of the county.

An assessment of all fire calls identified as wildland fires in the California Fire Incident Reporting System (CFIRS) from 2000 to 2023 indicated that 5,877 fires are coded with the wildland fire designation (CIFRS Code 141, 142 and 143). 5,611 of the fires in the database occurred within the El Dorado County limits. For the purposes of this analysis, mutual aid resources provided to adjacent fire agencies have been removed. This data was analyzed for comparison to the FRAP data. The CFIRS data shows that, on average, there are 234 wildland responses in a given year when averaged over the 24 years of data. It is then possible to make some observations about the frequency of wildland fires in El Dorado County. Looking at each year as a deviation from the average, there is a period of increased call loading in the 2004 to 2008 period where call frequency increased to 134% at its peak. There are three years where call volume was significantly less than the average (2010 at 63%; 2019 at 80% and 2022 at 72%).

The population of El Dorado County increased from 157,162 in 2000 to a current population of 192,215 (2023). This represents a 22% increase over the base year (2000). In 2000, the wildland calls per thousand population was 1.27 (Figure 5). Averaged over the 24 years, the rate is 1.30. Using this metric, the 2004 to 2008 period is still the upper limit with a smaller impact in the 2020-2021 period. It is important to note that 12 of the 24 years in this block of data (2000-2023) have total accumulations of wildland fire acres in El Dorado County (not including the federal forests) of under 500 acres. Five years have over 1,000 acres but less than 2,500 acres, a single year is at 8,786 and two years have over 100,000 acres (2014 and 2021). Within the FRAP database, the 1960’s had 81,444 acres, but there are no fires over 50,000 acres in the FRAP database for El Dorado County, other than the King (2014) and Caldor (2021) fires which were 97,685 and 221,786 acres, respectively. It should be noted that the King Fire occurred in a year that had only 98% of the 24-year average in terms of the number of fires and without the 97,685 acres, the other

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228 fires for 2014 only consumed 4,650 acres combined. Without the King and Caldor fires, the yearly average of acres over the past 24 years is 1,125 acres per year. It is important to repeat that this data does not have the federal fires in it and that other large fires have occurred in and around El Dorado County. This analysis is directed at the relationship of development to the number and impact of wildland fires due to the changes created by the development and increased populations associated with that development. The 24-year average for wildland fires per 1,000 population at the county level is 1.30 fire/1000 residents.

Year	Fires	Diff from Avg	% of Avg	Cum Acres	Population	Increase (over 2000)	Fires/1000 pop	% of Avg
2000	200	(33.8)	85.5%	1,183	157,162		1.27	98%
2001	211	(22.8)	90.3%	464	161,101	103%	1.31	101%
2002	212	(21.8)	90.7%	1,218	165,195	105%	1.28	99%
2003	249	15.2	106.5%	560	168,331	107%	1.48	114%
2004	283	49.2	121.0%	426	171,653	109%	1.65	127%
2005	219	(14.8)	93.7%	333	175,003	111%	1.25	96%
2006	297	63.2	127.0%	1,004	176,773	112%	1.68	129%
2007	301	67.2	128.7%	763	177,694	113%	1.69	130%
2008	312	78.2	133.5%	1,248	179,150	114%	1.74	134%
2009	197	(36.8)	84.3%	134	180,455	115%	1.09	84%
2010	148	(85.8)	63.3%	306	181,113	115%	0.82	63%
2011	219	(14.8)	93.7%	258	180,727	115%	1.21	93%
2012	229	(4.8)	98.0%	331	180,188	115%	1.27	98%
2013	268	34.2	114.6%	671	180,915	115%	1.48	114%
2014	229	(4.8)	98.0%	102,113	182,354	116%	1.26	96%
2015	254	20.2	108.6%	319	183,635	117%	1.38	106%
2016	236	2.2	100.9%	422	184,846	118%	1.28	98%
2017	213	(20.8)	91.1%	477	187,423	119%	1.14	87%
2018	221	(12.8)	94.5%	8,786	189,366	120%	1.17	90%
2019	187	(46.8)	80.0%	790	191,309	122%	0.98	75%
2020	291	57.2	124.5%	2,332	191,245	122%	1.52	117%
2021	267	33.2	114.2%	222,087	193,704	123%	1.38	106%
2022	168	(65.8)	71.9%	108	192,787	123%	0.87	67%
2023	200	(33.8)	85.5%	138	192,215	122%	1.04	80%
Sum	5,611			346,471				
Average	233.8			14,436			1.30	Average

Figure 5 – CalFire El Dorado County Database Summary

Project Area Data

The area around the project site has been developing for a number of years. To the north and west of the project site, large scale development has occurred. The blue shading is the developed area in the graphics on the next page (Figure 6 and Figure 7). The majority of the areas between the previous development area has been developed with some dedicated “open space” remaining that will not be developed in the future similar to the VMVSP. Similar developments have and are being completed to the west of the project site as well.

In order to examine the project site area specifically, it was necessary to find a way to measure the number of wildland fires and the populations within the adjacent area. It was determined that zip code areas would be one way since the call data from CalFire has this field. Of the 5,876 records provided by CalFire for wildland fire responses in El Dorado County, 5,611 occurred within the county or adjacent communities. Mutual Aid responses to fires outside of the immediate area were removed. Over 1,500 records did not have zip codes and had to be manually updated (46 records could not be updated out of the 5,611).

Using the three zip codes which cover or are adjacent to the project site (Figure 8), it was possible to track the population changes over time and the call volumes for each area. Combined, the population of this area increased from 50,545 in the year 2000 to 82,287 in 2020 (a 63% increase).

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The number of wildland fire calls for service fluctuated but remained relatively constant during this timeframe (Figure 9).

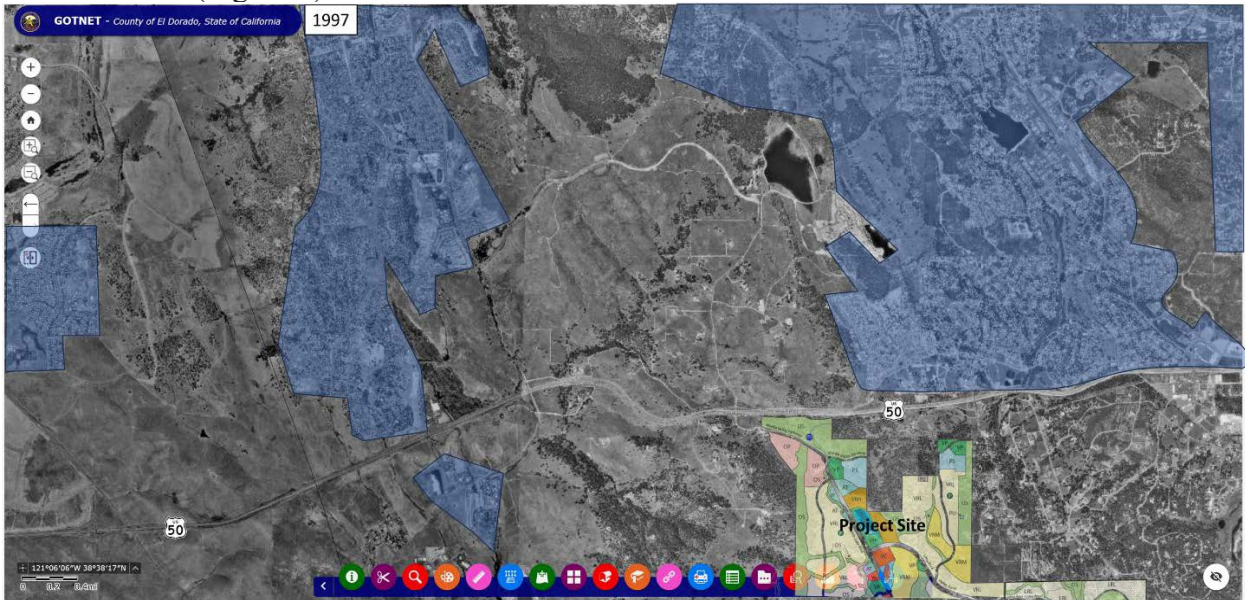


Figure 6 – Development Area 1997

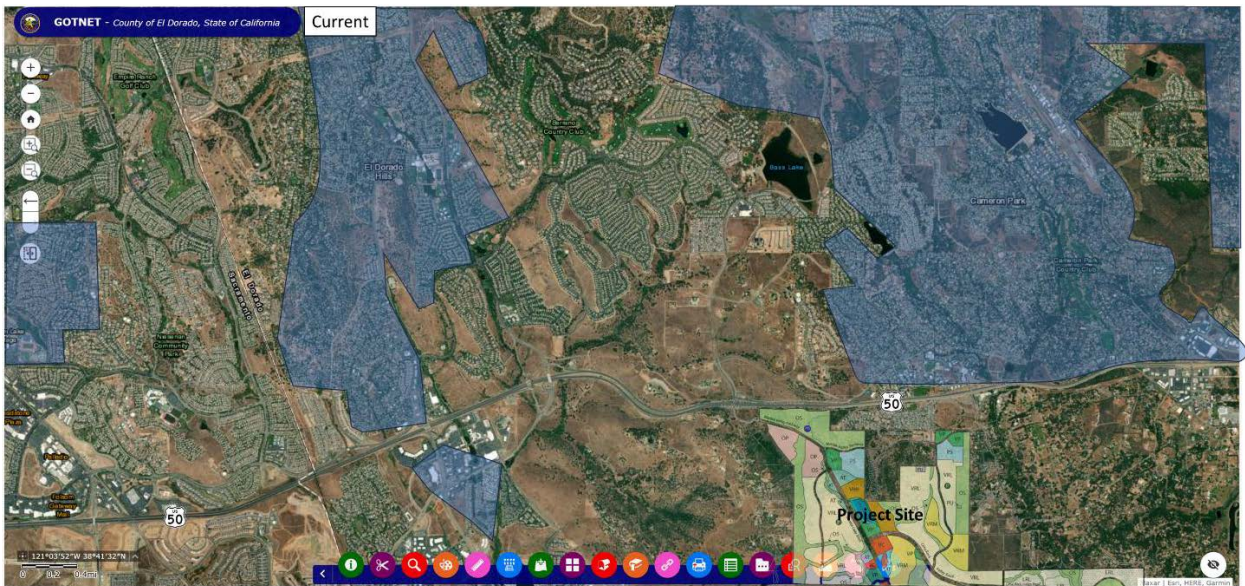


Figure 7 – Development Area 2023

Using the 24-year average (65 calls) it is possible to examine the deviation that has occurred in the call volume. Four years had increases above the average by over 20% (2001, 2006, 2016 and 2017) and two years (2012 and 2022) have decreases 45% or greater. Using 2000 as a base, projecting the call increases by the population increase would have resulted in a call volume of 91 for 2010 and a call volume of 103 for 2020. No single year exceeds 87 calls or a 30% increase and that occurred in 2006, not 2020 or later. In fact, the last three years (2021-2023) have had call volume of less than 100% of the 24- year average. An average population calculated with an average number of wildland calls over the 24 years produces a per capita rate of 0.94 per 1,000 residents. This represents a 23% reduction over the county wide 24-year average per capita rate.

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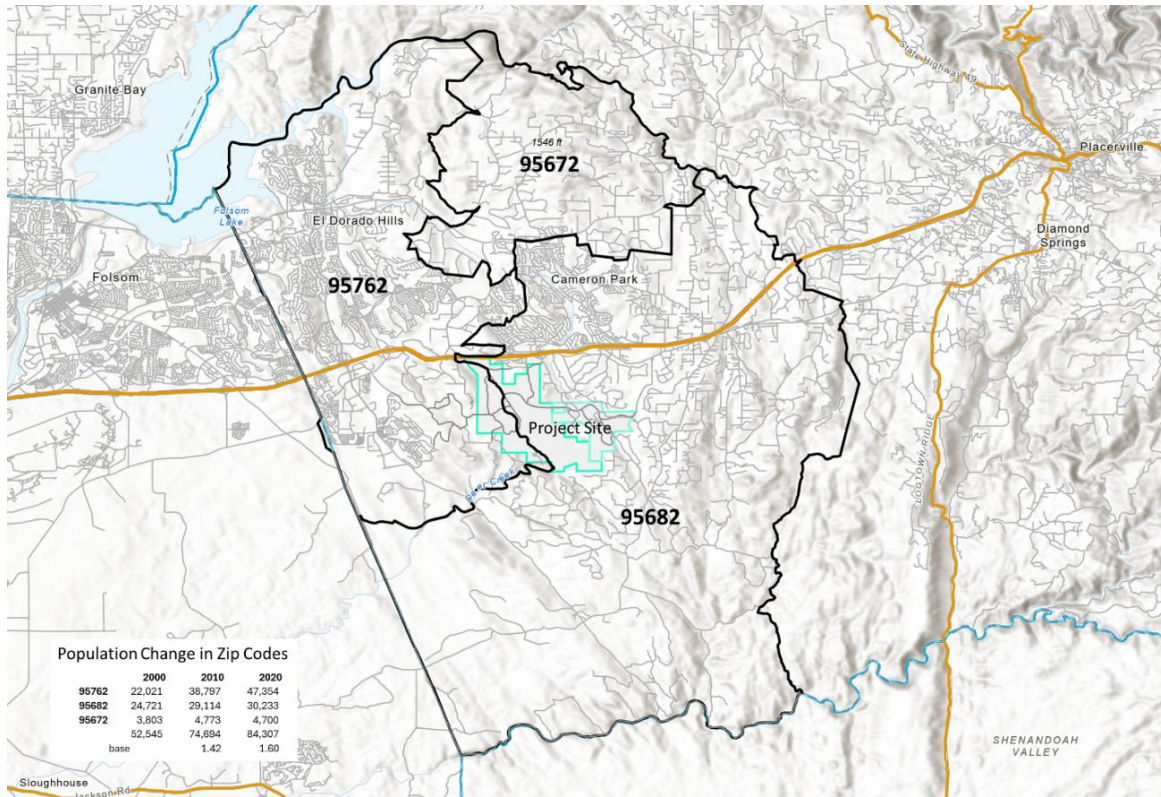


Figure 8 – Project Area Data (Zip Code Areas)

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Year	Fires	% of Avg	Population Increase	Projected Call Volume	Population			Sum	Fires/1000pop
					Zip Code 95762	Zip Code 95682	Zip Code 95672		
2000	63	97%			22,021	24,721	3,803	50,545	1.25
2001	82	127%							
2002	61	94%							
2003	64	99%							
2004	77	119%							
2005	60	93%							
2006	84	130%							
2007	60	93%							
2008	74	114%							
2009	46	71%							
2010	49	76%	1.44	91	38,797	29,114	4,773	72,684	0.67
2011	53	82%							
2012	34	53%							
2013	64	99%							
2014	79	122%							
2015	81	125%							
2016	87	134%							
2017	84	130%							
2018	72	111%							
2019	66	102%							
2020	70	108%	1.63	103	47,354	30,233	4,700	82,287	0.85
2021	61	94%							
2022	32	49%							
2023	50	77%							
Sum	1,553							Avg Pop	Avg/1000 pop
Avg	65							68,505	0.94

Figure 9 – Call Data for Zip Code 95762, 95682 and 95672 from 2000 to 2023

Population does not appear to be a significant driving force to wildland fires and per capita rates suggest that population density may reduce the ignition rate per capita, even if it increases the total number of fires overall. Increased population has a strong correlation to call types like medical aids, car accidents and structure fires but the correlation to wildland fires is less obvious and not supported by the findings of these databases.

Wildland Fire Impacts/Mitigations

The impacts to the community from large wildland fires (50 acres or more) are sustained in many ways. First and foremost is the direct threat of the flames and smoke damaging or destroying structures, property and putting lives at risk. Secondary to that are air and water pollution during and after the fire event. Also potential for flooding and earth movement from the loss of vegetation and other stabilizing aspects of the environment. Each of these impacts has multiple precautions or mitigations that can and do lessen the impact or in many cases eliminate the impacts entirely.

According to the U.S. Fire Administration (FEMA), wildland fires move from the naïve fuels to the structures in one of four ways:

1. Direct Flame Impingement
2. Radiant Heat
3. Convected Heat
4. Ember/Brand Intrusion

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Knowing how wildland fires move from the native fuels to the structures provides for a litany of options that can be employed to reduce the hazard to an acceptable risk or eliminate the risk altogether. As stated in the Appendix M, Vulnerability must be examined at multiple levels (Regional, Landscape, Community, and Parcel). At the end of the day, it all comes down to time, distance, and shielding. The amount of time that the fire will impact the area, the distance between the fire and the structures/residents, and the ability of the Project Site to shield its structures/residents from the harmful effects of the fire.

Time – reducing the amount of time that the fire can impact a structure

Distance – placing distance between the fire and the structure

Shielding – placing physical obstacles between the fire/fire products and the structure or the combustible portions of the structure.

The amount of time a structure is exposed to a fire is a critical component of whether or not the structure will be ignited. Time is a function of distance to the fuel, configuration of the interface and fuel loading of the fuels that are burning. An exposure of 12.5 kW/m^2 can ignite unprotected wood in as little as 20 minutes (*Cohen, J. D. (1995). Structure Ignition Assessment Model (SIAM) Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems, Walnut Creek, California*). Raising the value to 20 kW/m^2 reduces the time to 5 ½ minutes. Keeping the burnable fuels away from the structure not only reduces the chances of direct flame impingement, but it also reduces the time the structure will be subjected to the radiant and convected heat from that fire. Fuel reductions through fuel modification zones, fuel breaks, fire breaks, use of noncombustible surfaces such as roads, driveways, paths or pool decks can provide the protections necessary to reduce the amount of time the structure is impacted.

The orientation of the structure to the fire is very important as well. Fuels which are downslope from the structure are inherently more hazardous than fuels upslope. The nature of fire is to burn upslope due to the buoyancy/natural convection of the fire and heat moving up the slope which preheats the adjacent fuels and increases the impact on the fuels from the fire in the direction. The inverse is true downslope when the fire is above the structure and tends to be a slower backing fire unless it is driven by winds that overcome the slope effect. Keeping open out of the tops of canyons, draws, topographic chimneys, saddles or other features that channel heat and smoke reduce the amount of time that the structure will be impacted.

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Btu/s/ft ²	kW/m ²	Time to Ignition				
		Rate	Rate		seconds	minutes
17.3	60			10	0.17	
14.4	50			16	0.27	
11.6	40			28	0.47	
10.7	37					Damage to process equipment and collapse of mechanical structures
9.0	31			60	1.00	
8.7	30			66	1.10	
6.4	22			210	3.50	
5.8	20			337	5.50	Piloted wood ignition after 5.5 minutes
5.2	18					Death in 50% of victims after 30 seconds
4.6	16					Blistering of exposed skin after 5 seconds
3.6	12.5			1,200	20.00	20 minutes to ignition/2nd degree burn in 8 seconds
2.9	10					Pain on exposed skin after 3 sec/ death in 1% of victims after 40 seconds
2.0	7					Max exposure in PPE for 90 sec
1.8	6.4					Pain on exposed skin after 8 sec
1.4	5.0					2nd degree burns on exposed skin in 40 seconds
1.2	4.3			18,000	300.00	5 hours to ignition
1.2	4.0					First degree burns after 20 seconds
0.7	2.3					Pain on exposed skin after 2 minutes
0.6	2.1					Minimum to cause pain after 60 second
0.5	1.7					Minimum to cause pain
0.3	1.0					Equal to the maximum radiant heat transfer on a clear sunny day

Figure 10 -Radiant Heat Values

Distance is a major factor in the impact of direct flame contact, radiant and convected heat impacts and to a less degree, the number of embers that will impact a structure. Defensible space is based on the idea of distance and the modification of fuels within the established zones. Time and distance are interrelated, and it is not possible to impact one without the other having changes as well. This work both proactively and in the negative context.

As stated in the Appendix M, *“The Marble Valley project has been designed in a manner that provides efficient protection from wildfires. Perimeter structures must be protected from radiant heat, direct flame contact, and convected heat to a higher degree than the structures which are in the interior of the development envelope. This protection is achieved through distance, shielding and limiting the amount of fuel near the structures. This shielding of interior structures equates to decreased risk potential.”* Most of the “protections” available to structure in the WUI are in the Shielding category. Vents, covers, tempered glass, screens, noncombustible surfaces, and thicker materials are all methods of shielding the structure from the products of combustion as required by the California Building Code Chapter 7A and/or California Residential code Section R337. The term “Harden” as applied to WUI structure, speaks to these methods. Compliance with standards ensures that a structure is “hardened”.

IBHS writes, *“If all components of a home in a community are hardened against embers, the odds of a house becoming engulfed in tall, thick flames and radiating substantial heat to its surroundings are reduced. This allows the first responders to address spot fires early and prevent the spot fire from growing into a suburban conflagration.”*

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As detailed in the DEIR, Appendix M of the EIR, and the Applicant Responses to Comments, measures that will be implemented for the project site include:

- a) All dwelling units and most large commercial buildings will be protected with automatic fire sprinklers. (Fire department plan check and inspections ensure compliance)
- b) The Project Site has increasing housing density and used a consolidated design to reduce or eliminate, where possible, wildland fuels within the interior of the Project Site and keep the edge of the Project Site as an identifiable interface with appropriate fuel breaks, fire breaks and fuel modification/defensible space zones. (Implementation of Fire Safe Plan; Fire department plan check and inspections ensure compliance)
- c) The VMVSP has been designed to avoid and minimize low-density urban development patterns or leapfrog-type developments (i.e., those with undeveloped wildland between developed areas).
- d) The VMVSP has been designed to decrease the extent and amount of “edge,” or interface area, where development is adjacent to undeveloped wildlands.
- e) The Project Site has/will create buffer zones and defensible space within and adjacent to the development, with particular attention to ensuring that vegetation will not touch structures or overhang roofs. The Project will establish the legal obligations within the CC&R’s to ensure that defensible space measures are retained over time. (Implementation of Fire Safe Plan, Fire department plan check and inspections ensure compliance)
- f) Undergrounding of power lines will be accomplished in the entire Project Site. (Fire department plan check and inspections ensure compliance)
- g) The Project Site design attempts to limit development along steep slopes and amidst rugged terrain, so as to decrease exposure to rapid fire spread and increase accessibility for firefighting. Sites which have wildland fuels below (lower than the project structures) will have additional protections provided with radiant heat walls, increased built-in fire protection features and/or placement of the structure so that the impacts of “underslung fuels” are reduced. (Implementation of Fire Safe Plan, Fire department plan check and inspections ensure compliance)
- h) Fire hardening structures and homes in accordance with Chapter 7A of the Building Code, Section R337 of the Residential Code and the specific requirements of the fire department during the development review process for the site-specific locations. (Implementation of Fire Safe Plan, Fire department plan check and inspections ensure compliance)

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- i) Siting structures and features to maximize the role of low-flammability landscape features and roadways that may buffer the development from fire spread as required by 14 CCR § 1276.03(Fuel Breaks). (Implementation of Fire Safe Plan, Fire department plan check and inspections ensure compliance)
- j) The Project will expand existing fire resources in the region (new fire station site within the development). (Developer Agreement with Fire Department, participation in fire district)
- k) Placement of development within the existing or planned ingress/egress and potential evacuation routes to efficiently evacuate the project population and the existing community population, consistent with evacuation plans, while simultaneously allowing emergency access. (Implementation of Fire Safe Plan, Fire department plan check and inspections ensure compliance)

Intrinsic Safety is a method for ensuring safety by removing or lowering the causes of danger to a level where the risk is significantly reduced; whereas Functional Safety is reducing risks to an acceptable level to ensure safety by changing the form and function of the hazard interface. Both are necessary to achieve the required protection against wildland fires.

The benefits of density of units by overlapping restrictions around the structures are likely to occur by design in the Village Residential, Medium (5.0-12.0 du/acre) and Village Residential, High (12.0-24.0 du/acre) land use designations for VMVSP. For the Village Residential, Low (0.9-5.0 du/acre) with an average density of 2.9 du/acre, these restrictions will likely overlap for many units. For development at all ranges of density, the system's based approach, current standards described above, and the addition of new roads and firefighting capacity in the undeveloped area will also minimize wildfire risks and be enforced through the wildfire safety plans.

As implemented through HAZ-8, the wildfire safety plan approved at each small lot tentative subdivision map will include measures to reduce the risks of wildfire from humans based on the most current standards at the time of the tentative map. This will ensure that the most current standards, which are expected to become more stringent over time, are adopted and the wildfire safety plan is able to address the layout of each tentative map. The wildfire safety plan will be required to reduce human causes. While the wildfire safety plan would address all of the human-causes addressed herein and apply the most current stringent standards, to provide further assurances at this programmatic stage, it is recommended that HAZ-8 be amended to include minimums that would expressly address wildfires caused by humans. Including revisions proposed in the September 6, 2024 applicant response, it is therefore recommended that HAZ-8 be amended to provide:

Prior to ~~approval of a~~ ~~the~~ ~~submittal of the first~~ small lot tentative subdivision map, the County will require a ~~the preparation of a~~ wildfire safety plan reviewed and approved by CAL FIRE and the local fire protection district that is appropriate to the high and very high fire classifications of the plan area on the CAL FIRE Hazard Severity Zone Map for El Dorado County. The wildfire safety plan will include, but not be limited to, the following.

- Site and project description
- Applicable codes and regulations

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- *Fire department response capabilities*
- *Site fire risk assessment (weather, fuels, topography, fire and ignition history, and potential fire behavior)*
- *Fire safety requirements (vegetation management, structural hardening site access, water availability, alternative materials and methods)*
- *Response strategies for emergency evacuations related to wildfire (number of people using routes; accessibility of routes; any disruptions to routes from natural hazards; and location and capacity of emergency shelters), including written proof of legal access rights to use any routes on private roads for required EVAs, which may be in the form of a recorded easement or recorded agreement with the private property owner or private homeowners or road association*
- *Frequency of fuel management*
- *Prohibition of smoking in public open space areas*
- *Ban of solid fuel outdoor fires within the community without spark arrestor and only in approved devices*
- *No Open Burning in the fuel modification zones, open space or within 50 feet of the wildland interface.*
- *Adoption/application of most current regulations and standards regarding the type and nature of equipment utilized in open space areas*
- *Sites with wildland fuels below (lower than the project structures) must have additional protections provided that is equal to or greater than the risk associated with the configuration, as approved by the fire authority having jurisdiction. This may include radiant heat walls, increased built-in fire protection features and/or placement of the structure so that the impacts of “underslung fuels” are addressed.*
- *Structures and features shall be sited to maximize the role of low-flammability landscape features and roadways that may buffer the development from fire spread as required by 14 CCR § 1276.03(Fuel Breaks)*
- *Funding source*

Conclusion

The California Governor’s Wildland Strike Force (2014) said it succinctly:

California has made progress in developing and adopting stringent wildland building codes. Since 2008, new construction in California’s wildlands must use ember-resistant building materials. For homes built before the 2008 standards, CAL FIRE is working to develop a list of low-cost retrofit steps homeowners can take. In addition, the Office of the State Fire Marshal (OSFM) maintains an advisory committee of fire and building officials that continuously considers building code updates to improve fire safety. Most recently, OSFM advanced building code changes including sealing of garage door gaps, sealing skylights and safety improvements to outbuildings.

Developing new housing in Very High Fire Hazard Severity Zones presents challenges. Since 2015, CAL FIRE has assisted local governments in land use planning. CAL FIRE is working to identify subdivisions at significant fire risk without secondary evacuation routes and to make recommendations to improve access.

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Homeowners are encouraged to actively maintain defensible space, which is defined as a minimum 100-foot area around a home. Maintenance is an ongoing task. California inspected more than 217,600 homes for defensible space compliance in 2017-2018 alone.

It is critical that roads and other infrastructure be more fire defensible and evacuation ready for the populations in the WUI. All levels of government must establish clear contingency plans with local communities to identify and create temporary refuge areas and shelter-in-place procedures to help fire evacuees survive when unable to escape a wildfire.

Wildfires and Climate Change: California's Energy Future., A report from Governor Newsom's Strike Force April 12, 2019

All of the issues addressed above are or will be included in the new development areas by the approved design, ordinance, statute or regulation, as detailed above, in the DEIR, Appendix M, and the Applicant Responses to Comments.

In a paper entitled, “Mandated vs. Voluntary Adaptation to Natural Disasters: The Case of U.S. Wildfires”, Patrick W. Baylis and Judson Boomhower produced a Working Paper (#29621 <http://www.nber.org/papers/w29621> NATIONAL BUREAU OF ECONOMIC RESEARCH 1050 Massachusetts Avenue Cambridge, MA 02138 December 2021) that stated:

“...The complex nature of building regulation in California creates a patchwork of wild re standards across localities. We also observe res in other states that do not have wild rebuilding codes. In all of these places, we observe homes built before and after changes in Californias codes. This identifying variation yields credible counterfactual predictions for how homes would have performed in the absence of Californias standards. Our preferred statistical model is a fixed effects regression that compares the likelihood of survival for homes of different vintages on the same residential street during the same wild re event. These street fixed effects allow us to compare groups of homes that experience essentially identical wild re exposures.

*We find remarkable vintage effects for California homes subject to the states wildfire standards. **A 2008 or newer home is about 16 percentage points (40%) less likely to be destroyed than a 1990 home experiencing an identical wild re exposure.** There is strong evidence that these effects are due to state and local building code changes- first after the deadly 1991 Oakland Firestorm, and again with the strengthening of wild re codes in 2008. The observed vintage effects are highly nonlinear, appearing immediately for homes built after building code changes. There are no similar effects in areas of California not subject to these codes or in other states that lack wild re codes.*

We also find that code-induced mitigation benefits neighboring homes, consistent with reduced structure-to-structure spread. These neighbor effects are in keeping with anecdotal reports of home-to-home spread as a factor in urban conflagrations (Cohen 2000; Cohen and Stratton 2008; Cohen 2010).⁵ Our results imply that, all

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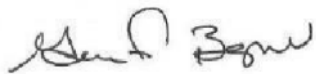
*else equal, code-induced mitigation by a neighbor located less than 10 meters away (within the distance re experts refer to as the home ignition zone) **reduces a home’s likelihood of destruction during a wild re by about 2.5 percentage points (6%). This benefit is even larger when homes have multiple close neighbors.***”

These observations are likely the reason why newer tract homes (built to current standards and codes) which are in an interface condition (one interface for multiple homes in a tract) rather than an intermix (wildland fuels between homes) tend to not have significant losses due to the fire at the edge of the community. These newer homes are hardened, have defensible space, have fuel modification zones, have a water supply that meets the current requirement and have ingress and egress which meets the current codes and regulations. Projects, such as the project site, have more fire protection features, at a community level, than any of the existing single-lot developments or even planned communities of the past.

Therefore, while most fires are caused by humans, the risk of wildfire from increased population does not have a linear correlation and data shows that development of the proposed project under the most current standards at the time of development with mandatory mitigation measures and VMVSP policies suggest that wildfire risks are not significantly increased with increased population of development under current standards. Studies, such as those cited herein, have indicated that as development reaches a higher density of units per acre and population, the wildland fire issue is impact in a positive manner, likely due to the disruption of the wildland fuels but also due to increase suppression activities and early detection. As further explained in Appendix M, even with the additional population increase, development of the project will provide an overall benefit to the existing communities related to wildfires. As such, the increased wildfire risk from human-ignited wildfire will remain less than significant with mitigation as stated in the DEIR.


Firesafe submits this response to comments regarding the Draft Environmental Impact Report for the Village of Marble Valley Specific Plan as it relates to *People of the State of California Ex Rel. Rob Bonta, Attorney General v. County of Lake & Lotusland Investment Holdings, Inc.* (2024) 105 Cal.App.5th 1222 (“*Lotusland*”).

Respectfully;



Gene F. Begnell
Fire Protection Analyst
Firesafe Planning Inc.

Concurrence;



David Oatis
Principal
Firesafe Planning Inc.

Reports, Articles, And Sources in Support of *Lotusland* Response

1. *Wildland Fire Evacuation Risk Report - Fire Behavior - The Village of Marble Valley Project* prepared by Firesafe Planning, Inc. dated October 24, 2023, in Appendix M of the DEIR
2. *Conservation Threats Due to Human-Caused Increases in Fire Frequency in Mediterranean-Climate Ecosystems*, Alexandra D. Syphard, Volker C. Radeloff, Todd J. Hawbaker, Susan I. Stewart, First published: 15 May 2009, <https://doi.org/10.1111/j.1523-1739.2009.01223>
3. *Effects of changing development patterns and ignition locations within Central Texas*, Mobley, W, (Feb. 2019) <https://pubmed.ncbi.nlm.nih.gov/30730903/>
4. Western Fire Chiefs Association (WFCFA), What Causes Wildfires? <https://wfca.com/wildfire-articles/what-causes-wildfires/>
5. *Human- and lightning-caused wildland fire ignition clusters in British Columbia, Canada*, Sean C. P. Coogan A *, Olivia Aftergood A and Mike D. Flannigan B., International Journal of Wildland Fire 1043-1055 <https://doi.org/10.1071/WF21177> Published: 11 October 2022
6. CalFire database (<https://www.frontlinewildfire.com/wildfire-news-and-resources/california-wildfires-history-statistics/>)
7. Chen, B 2021 - JGR Biogeosciences - *Climate Fuel and Land Use Shaped the Spatial Pattern of Wildfire in California's Sierra Nevada* <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2020JG005786>.
8. Cohen, J. D. (1995). *Structure Ignition Assessment Model (SIAM) Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems*, Walnut Creek, California) [gtr-158-body](#)
9. FEMA publication Protecting structures from wildfire embers and fire exposures Sept. 17, 2024 [https://www.usfa.fema.gov/blog/protecting-structures-from-wildfire-embers-and-fire-exposures/#:~:text=Landing%20on%20the%20structure.,sheds%2C%20woodpiles%2C%20etc.\)](https://www.usfa.fema.gov/blog/protecting-structures-from-wildfire-embers-and-fire-exposures/#:~:text=Landing%20on%20the%20structure.,sheds%2C%20woodpiles%2C%20etc.))
10. *Home-Mitigations-that-Matter*- IBHS <https://ibhs1.wpenginepowered.com/wp-content/uploads/Home-Mitigations-that-Matter-FINAL.pdf>
11. *Wildfires and Climate Change: California's Energy Future.*, A report from Governor Newsom's Strike Force April 12, 2019 <https://www.gov.ca.gov/wp-content/uploads/2019/04/Wildfires-and-Climate-Change-California%E2%80%99s-Energy-Future.pdf>
12. *Mandated vs. Voluntary Adaptation to Natural Disasters: The Case of U.S. Wildfires*", Patrick W. Baylis and Judson Boomhower produced a Working Paper (#29621 <http://www.nber.org/papers/w29621> NATIONAL BUREAU OF ECONOMIC RESEARCH 1050 Massachusetts Avenue Cambridge, MA 02138 December 2021) <https://www.nber.org/papers/w29621>

Appendix E

**Village of Marble Valley Specific Plan –
Fire Evacuation Assessment Route Modification**

February 7, 2025

Cameron Welch
El Dorado County Planning Services
2850 Fairlane Court
Placerville, CA 95667

Subject: Village of Marble Valley Specific Plan – Fire Evacuation Assessment Route Modification

Fehr & Peers completed its review and evaluation of evacuation routes available to the Village of Marble Valley Specific with construction of East Ridge Village. This memorandum summarizes the changes to emergency access and the findings of the *Village of Marble Valley Specific Plan Fire Evacuation Assessment – Draft* (Fehr & Peers, September 28, 2023) with modified evacuation routes.

Emergency Access Changes with East Ridge Village

The *Village of Marble Valley Specific Plan Fire Evacuation Assessment – Draft* (Fehr & Peers, September 28, 2023)¹, Figure 2, shows the location of the following evacuation routes used for the Village of Marble Valley Specific Plan evacuation assessment:

- **North (N) Access** – Connection to the US 50/Cambridge Road Interchange.
- **Northwest (NW) Access** – Connection to the US 50/Bass Lake Road Interchange.
- **EVA 1** – Connection to Diablo Trail/Marble Ridge Road under existing conditions with a potential future connection to the approved East Ridge Village. As analyzed, EVA 1 provided access to the NW Access.
- **EVA 3** – Connection to Ryan Ranch Road/China Diggins Road.

The East Ridge Village project, which began construction in 2024 includes an Emergency Vehicle Access (EVA) connection to the Village of Marble Valley Specific Plan (i.e., at EVA 1). As outlined above, at the time the *Village of Marble Valley Specific Plan Fire Evacuation Assessment – Draft* (Fehr & Peers, September 28, 2023) was conducted, EVA 1 was only assumed to connect to Diablo Trail/Marble Ridge Road, since East Ridge Village did not exist. However, now that construction of East Ridge Village is occurring, it is reasonable to assume an emergency access connection between the Village of Marble Valley Specific Plan and East Ridge Village at EVA 1, since the EVA connection is included in the *Valley View Specific Plan East Ridge Village (Amendment A) Wildland Fire Safe Plan* (CDS Fire Prevention Planning, August 24, 2014).

¹ *Village of Marble Valley Specific Plan Fire Evacuation Assessment – Draft* (Fehr & Peers, September 28, 2023). The document can be found at Draft Environmental Impact Report Appendix N (Fire Evacuation Assessment).



The following summarizes the access modifications:

- **EVA 1** – The connection to the US 50/Bass Lake Road Interchange (NW Access), through the Marble Mountain community, would be replaced by the connection through East Ridge Village.
- **EVA 3** – The connection to Ryan Ranch Road/China Diggins Road would be eliminated.

Figure 1 compares the Village of Marble Valley Specific Plan evacuation routes with the EVA 1 connection to East Ridge Village to the routes analyzed in the original analysis. **Table 1** compares the number of external connections to evacuation corridors provided by the original and modified EVA access.

Table 1: EVA Access Route - External Connections to Evacuation Corridors

External Connection	Would Comply with PRC Section 4290	Original Analysis ¹	Modified Routes
1. US 50/Cambridge Road Interchange	Yes	X	X
2. US 50/Bass Lake Road Interchange	Yes	X	X
3. Latrobe Road/ Ryan Ranch Road	No	X	
4. White Rock Road/Valley View Parkway	Yes		X
5. Latrobe Road/Clubview Drive	Yes		X
6. Latrobe Road/Royal Oaks Drive	Yes		X
	Total	3	5

Notes:

¹Village of Marble Valley Specific Plan Fire Evacuation Assessment – Draft (Fehr & Peers, September 28, 2023). The document can be found in Draft Environmental Impact Report Appendix N (Fire Evacuation Assessment).

Source: Fehr & Peers, 2024

As shown in **Table 1**, the modified access would provide two more external connections to evacuation corridors than analyzed. Access to the US 50/Bass Lake Road and US 50/Cambridge Road Interchanges will be maintained. The connection of EVA 1 to the East Ridge Village will provide a higher capacity evacuation route for the Village of Marble Valley, relative to EVA 3, since the roadways in East Ridge Village will provide three connections to evacuation corridors.

Furthermore, the roadways in East Ridge Village are being constructed to meet the requirements of Public Resources Code (PRC) Section 4290 requirements (e.g., road width, compaction rating, slope, surface material, gates, etc.) in addition to the enhanced building codes, defensible space, and fuel modifications that will prevent “burn through” of East Ridge Village. By comparison, Ryan Ranch Road and Marble Ridge Road do not meet PRC Section 4290 requirements and do



not benefit from enhanced codes, defensible space, and fuel modification zones. Consequently, EVA 1 will provide a superior route to EVA 3, which was compromised on most of the fire scenarios on the west side of the development area.

Although not necessary for the evacuation of the Village of Marble Valley Specific Plan, the Village of Marble Valley is willing accommodate a future emergency vehicle connection to Ryan Ranch Road and Marble Ridge Road if desired by El Dorado Hills Fire to provide additional emergency access to the Ryan Ranch and Marble Mountain communities from the Village of Marble Valley.

Results and Conclusions

Chapter 3.7 (Hazards and Hazardous Materials) of the Draft Environmental Impact Report (DEIR) discusses wildfire and evacuation, more specifically, Impact HAZ-8 (DEIR pg. 3.7-20) provides extensive analysis of emergency response and evacuations under fire event scenarios. As analyzed, implementation of the risk reduction measures set forth in *Wildland Fire Evacuation Risk Report – Fire Behavior – The Village of Marble Valley Project*, the proposed development area will have a less than significant impact from the wildland fire-related issues raised under the AG Guidelines, as well as under CEQA Guidelines Appendix G, Wildfire.

Replacing EVA 3 with the higher capacity connection to EVA 1 and the East Ridge Village will result in improved evacuation conditions for the Village of Marble Valley Specific Plan, relative to the conditions analyzed in Impact HAZ-8, and the impact would remain less than significant.

Sincerely,

FEHR & PEERS

David B. Robinson, PE
Regional Principal

