# Russell Ranch Project

## Draft
## Environmental Impact Report

### Volume III of III
### Appendices I - J

SCH # 2014062018

Prepared for
**the City of Folsom**

December 2014

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# APPENDIX I

# Russell Ranch

# Final Transportation Impact Study

## Prepared for:
## City of Folsom

December 2014

RS14-3229

FEHR PEERS

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# INTRODUCTION

This study evaluates potential impacts of the proposed Russell Ranch project (proposed project) upon the surrounding transportation system. The impact analysis conducted for this study examines the roadway, transit, bicycle, pedestrian, and construction components of the overall transportation system under the following scenarios:

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative (2035) No Project Conditions – assumes build-out of Russell Ranch consistent with the land uses and infrastructure assumptions contained in the Folsom Plan Area Specific Plan (FPASP) and its accompanying joint Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) approved/certified by the City of Folsom in June 2011.
- Cumulative (2035) Plus Project Conditions – assumes build-out of the proposed project consistent with the land uses and infrastructure assumptions contained in the current development permit application submitted to the City of Folsom.

For the “plus project” scenarios, significant impacts as defined by CEQA are identified, and mitigation measures are recommended to offset the impacts.

## STUDY AREA

The project site, shown in Figure 1, is generally located between US 50 to the north, Placerville Road to the west, the Sacramento County/El Dorado County line to the east, and White Rock Road to the south, within the City of Folsom. The site and all adjoining parcels are currently undeveloped. As shown in Figure 1, the study area extends north and west to Broadstone Parkway, south to White Rock Road, and east to El Dorado Hills Boulevard/Latrobe Road. Study locations were selected based on the expected travel characteristics associated with the project (i.e., project location and amount of project trips), as well as the susceptibility of nearby intersections to increased traffic or changes in travel patterns due to implementation of the project. The study locations were submitted for review and approval by the City of Folsom Public Works Department staff prior to commencing the study.

### INTERSECTIONS

The following twelve study intersections were selected for study as part of the transportation analysis:

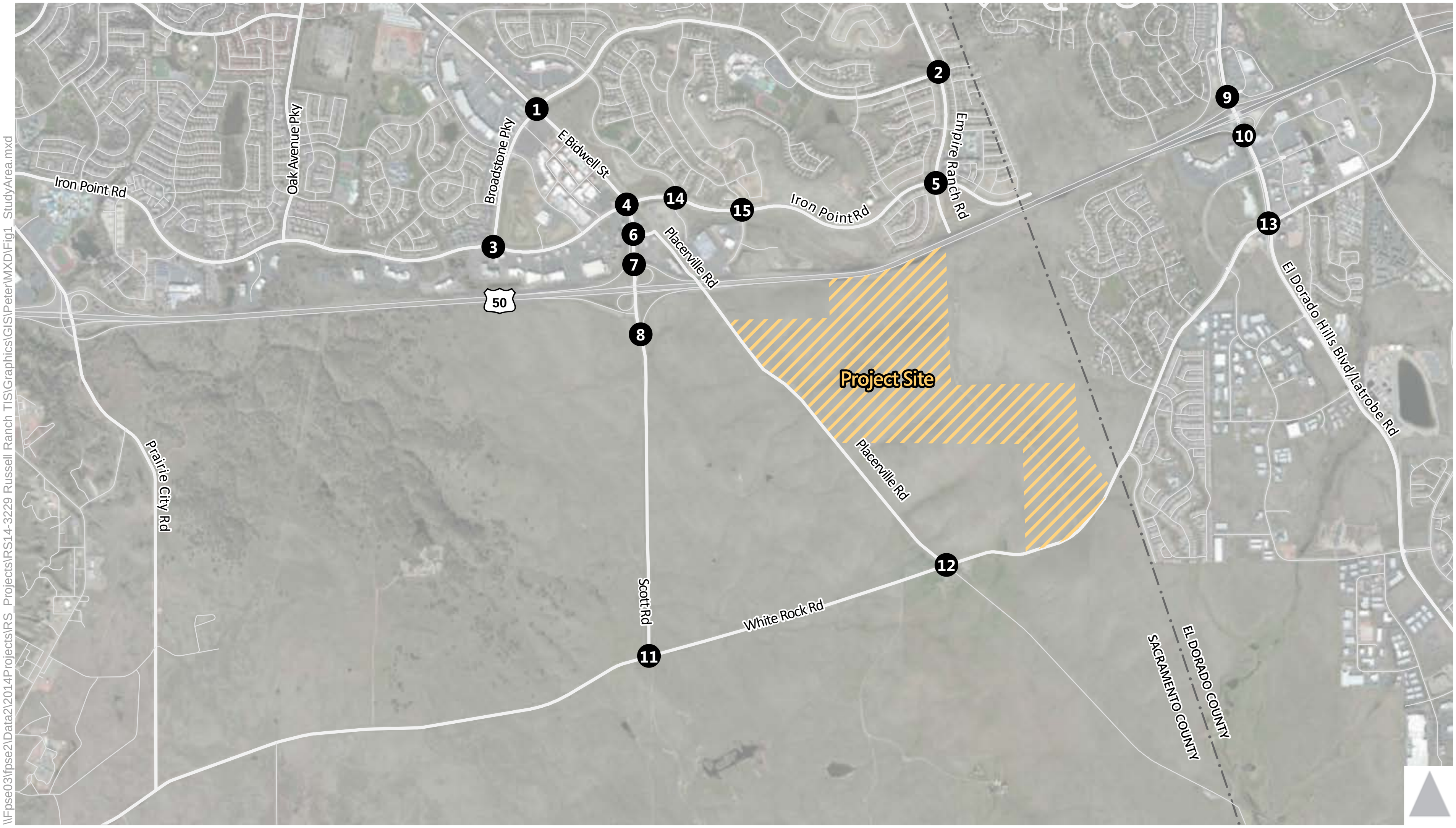
1. Broadstone Parkway/East Bidwell Street
2. Empire Ranch Road/Broadstone Parkway
3. Broadstone Parkway/Iron Point Road
4. East Bidwell Street/Iron Point Road
5. Empire Ranch Road/Iron Point Road
6. East Bidwell Street/Placerville Road
7. Scott Road/US 50 Westbound Ramps
8. Scott Road/US 50 Eastbound Ramps
9. El Dorado Hills Blvd/US 50 Westbound Ramp
10. Latrobe Road/US 50 Eastbound Ramp
11. White Rock Road/Scott Road
12. Payen Road/Placerville Road
13. Latrobe Road/White Rock Road
14. Cavitt Drive/Iron Point Road
15. Serpa Way/Iron Point Road

## FREEWAY FACILITIES

The following basic, merge, and diverge freeway facilities were selected for evaluation consistent with comments received from Caltrans on the project's Notice of Preparation (NOP):

- EB US 50 west of Prairie City Road – Basic
- EB US 50 Prairie City Road Off-Ramp – Diverge
- EB US 50 between Prairie City Road Ramps – Basic
- EB US 50 Prairie City Road On-Ramp – Merge
- EB US 50 Prairie City Road On-Ramp II – Merge
- EB US 50 Prairie City Road to Scott Road – Basic
- EB US 50 Scott Rd. Off-Ramp – Diverge
- EB US 50 between Scott Rd. Ramps – Basic

- EB US 50 Scott Rd. Loop On-Ramp – Merge
- EB US 50 Scott Rd. On-Ramp II – Merge
- EB US 50 Scott Rd. to Latrobe Rd. (Segment I) – Basic
- EB US 50 Scott Rd. to Latrobe Rd. (Segment II) – Basic
- EB US 50 Latrobe Rd. Off-Ramp I – Diverge
- EB US 50 Latrobe Rd. Off-Ramp II – Diverge
- EB US 50 between Latrobe Rd. Ramps – Basic
- EB US 50 Latrobe Rd. On-Ramp – Merge
- EB US 50 US 50, East of Latrobe Rd. – Basic
- WB US 50 East of El Dorado Hills Blvd. - Basic
- WB US 50 El Dorado Hill Blvd Off-Ramp - Diverge
- WB US 50 between El Dorado Hills Blvd. Ramps - Basic
- WB US 50 El Dorado Hills Blvd. On-Ramp - Merge
- WB US 50 El Dorado Hills Blvd. to E. Bidwell Rd. (Segment I) - Basic
- WB US 50 El Dorado Hills Blvd. to E. Bidwell Rd. (Segment II) - Basic
- WB US 50 East Bidwell Off-Ramp - Diverge
- WB US 50 between E. Bidwell Rd. Ramps - Basic
- WB US 50 E. Bidwell Rd. Loop On-Ramp - Merge
- WB US 50 E. Bidwell Rd. On-Ramp II - Merge
- WB US 50 East Bidwell to Prairie City Rd. - Basic
- WB US 50 Prairie City Off-Ramp - Diverge
- WB US 50 between Prairie City Rd. Ramps - Basic
- WB US 50 Prairie City Rd. Loop On-Ramp - Merge
- WB US 50 Prairie City Rd. On-Ramp II - Merge
- WB US 50 west of Prairie City Rd. - Basic




# Study Intersection

Figure 1

## Study Area

# EXISTING ENVIRONMENTAL SETTING

The section below describes the physical and operational characteristics of the transportation system within the study area including the surrounding roadway network, transit, rail, bicycle, and pedestrian facilities, and existing traffic operations.

The proposed project site is generally located between US 50 to the north, Placerville Road to the west, the Sacramento County/El Dorado County line to the east, and White Rock Road to the south, within the City of Folsom. The US Highway 50 (US 50)/East Bidwell Street/Scott Road interchange would serve as the closest access point to the regional freeway system for the proposed project. Detailed descriptions of key roadway facilities within the study area are provided below.

## ROADWAY SYSTEM

- *US 50* is an east-west highway that passes through Folsom, California as it connects the Sacramento region to Lake Tahoe and points beyond. Within the study area, US 50 west of East Bidwell Street is a six-lane freeway with two regular flow lanes and one high-occupancy vehicle (HOV) lane in each direction. East of East Bidwell Street US 50 has three westbound lanes (two mainline lanes, one HOV lane) and four eastbound lanes (three mainline lanes, one HOV lane). The speed limit on US 50 through Folsom is 65 miles per hour (mph).
- *East Bidwell Street* runs through the City of Folsom from US 50 to Riley Street. South of US 50, East Bidwell Street becomes Scott Road. Near the project area, East Bidwell Street is a six lane arterial roadway with turn pockets provided at intersections. The speed limit on East Bidwell Street north of US 50 is 45 mph. South of the US 50 westbound ramps East Bidwell Street has four lanes, and south of the US 50 eastbound ramps East Bidwell Street transitions into Scott Road.
- *Scott Road* is a two-lane north-south roadway that extends from the US 50/East Bidwell Street/Scott Road interchange south to White Rock Road. A separate discontinuous segment of Scott Road, located approximately 1.5 miles to the west, extends southward from White Rock Road into unincorporated Sacramento County. This segment also features two travel lanes.
- *Placerville Road* is a two-lane north-south road that begins at East Bidwell Street, just north of US 50, and continues beneath US 50 via an undercrossing. The roadway extends south to White Rock Road, where it transitions into Payen Road.
- *White Rock Road* is a two-lane east-west road within the study area, and has a posted speed limit of 55 mph. White Rock Road continues east into El Dorado County where it transitions into Silva Valley Parkway, and west into the City of Rancho Cordova.

- *Iron Point Road* is an east-west arterial roadway with a raised median that runs from Folsom Boulevard to the eastern city limit along the north side of US 50. Within the vicinity of the project, Iron Point Road has six lanes and posted speed limit of 45 mph.
- *Broadstone Parkway* is an arterial roadway that runs from Iron Point Road to Empire Ranch Road on the north side of US 50. The roadway features four-to-six travel lanes, a raised median, and a posted speed limit of 45 mph.
- *Empire Ranch Road* is a north-south arterial that runs from East Natoma Street to Iron Point Road. The road consists of four lanes with a landscaped median and feature bike lanes in both directions. The posted speed limit is 45 mph.

## BICYCLE/PEDESTRIAN SYSTEM

The City of Folsom has an extensive bicycle network on the north side of US 50 including Class II on-street bike lanes on East Bidwell Street north of Old Placerville Road and on the entire length of Iron Point Road and Empire Ranch Road within the study area. There is also an existing Class I bike path along the east side of Placerville Road and along the south side of Iron Point Road to Serpa Way. Figure 2 displays existing bicycle facilities within the study area.

Future plans include an extension of the existing Class I bike path east of Serpa Way, as well as Class I bike paths north of Iron Point Road along the east side of East Bidwell Street, and west of East Bidwell Street south of Iron Point Road.

Sidewalks exist on both sides of East Bidwell Street/Scott Road from the US 50 east ramps to Iron Point Road. North of Iron Point Road, there is a separated sidewalk on the west side of East Bidwell Street and no sidewalk on the east side. The majority of Empire Ranch Road and Iron Point Road have sidewalks on both sides of the roadway with some missing sections adjacent to vacant parcels.

Within the immediate vicinity of the project site bicycle and pedestrian facilities are currently not provided due to the undeveloped nature of the area. In coordination with new development and roadway construction, bicycle and pedestrian facilities will be installed according to current standards.

## TRANSIT SYSTEM

The City of Folsom Transit Division provides fixed route and dial-a-ride service within the City (Folsom Stage Line). Fixed route service is provided Monday through Friday on three routes. Route 10 runs from 4:25 AM to 7:45 PM, and connects to Sacramento Regional Transit (RT) Light Rail and RT bus Route 24.

Route 20 runs during the morning commute period from 7:00 AM to 7:45 AM Monday through Friday, and during the afternoon commute period from 3:15 PM to 3:45 PM Monday, Tuesday, Thursday, and Friday, and from 1:40 PM to 2:15 PM on Wednesdays. Route 10 provides service on East Bidwell Street north of Broadstone Parkway and on Iron Point Road west of Palladio Parkway within the study area. Route 20 provides service on Broadstone Parkway and Empire Ranch Road within the study area. Route 30 runs during the morning commute period from 6:00 AM to 8:10 AM and during the PM peak period from 2:40 PM to 5:00 PM Monday through Friday. Route 30 connects Woodmere Road and Glenn Rive to City Hall and Folsom Prison.

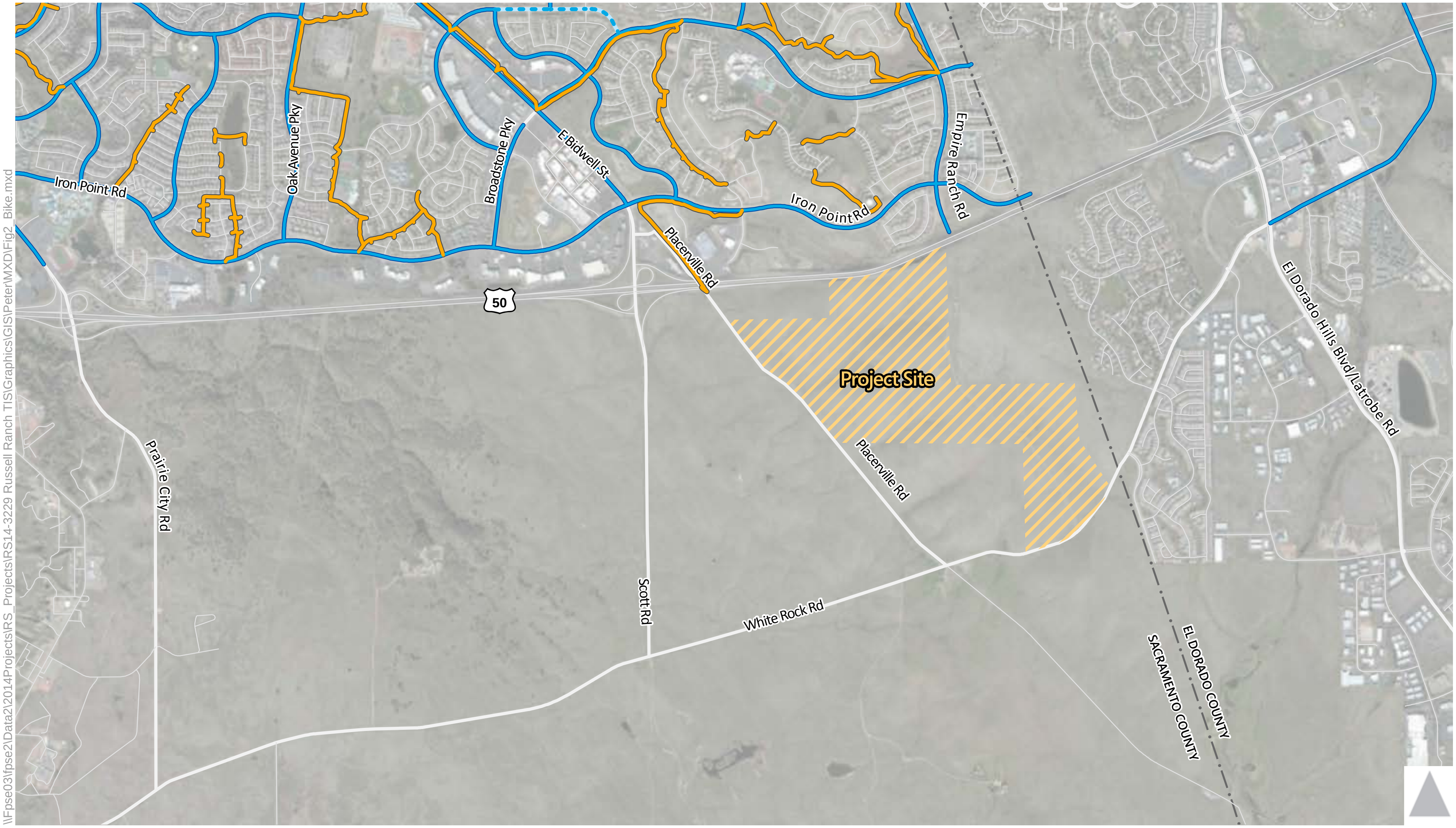
The Folsom Stage Line Dial-A-Ride service is provided for senior citizens age 55 and older, and residents with physical, developmental, or mental disabilities.

Sacramento RT provides bus and light rail service in the Sacramento region. The Gold Line Light Rail and RT bus Route 24 serve the City of Folsom. Light Rail service is provided seven days per week, including holidays. Bus service is provided Monday through Friday from 6:00 AM to 7:22 PM. Weekend and holiday service is not provided.

Figure 3 displays existing transit service within the study area.

## RAIL CROSSING

There is an existing railroad line that runs along the east side of Placerville Road and East Bidwell Street. This rail corridor is known as the Sacramento-Placerville Transportation Corridor and is owned by a Joint Powers Authority (SPTC JPA). The corridor has not been in commercial service for almost 30 years, with only intermittent use by local rail preservation organization for maintenance or recreational train rides. Within the study area, the rail corridor crosses Broadstone Parkway just east of East Bidwell Street, Iron Point Road just east of East Bidwell Street, and White Rock Road just east of Placerville Road. However, due to its inactive status the crossing has no significant effect on vehicle traffic in the area.

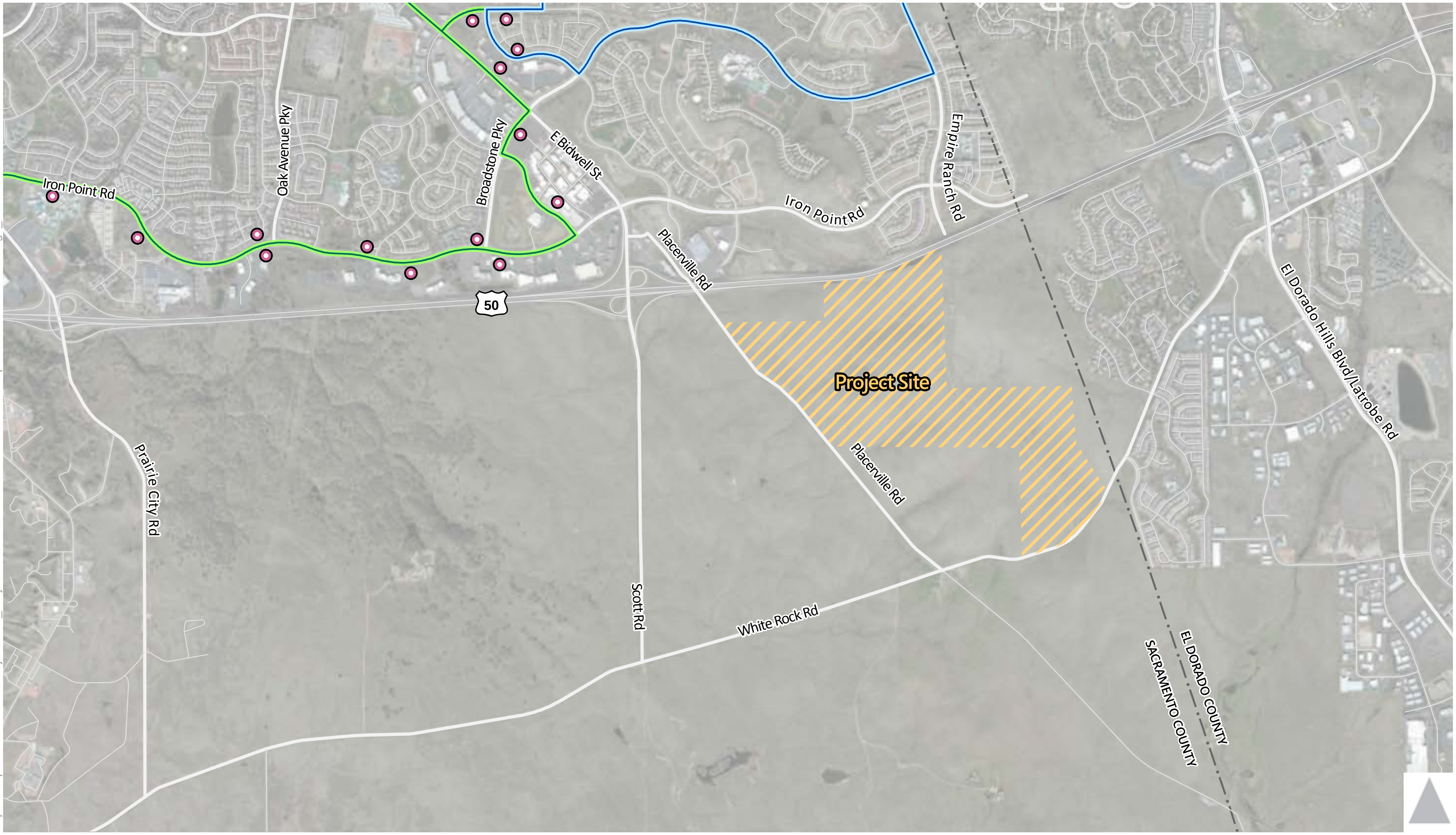



Class I Bike Path
Class II Bike Lane
Class III BIke Route



Figure 2

Existing Bicycle Network




**Transit**

Route 10

Route 20 Peak

Bus Stop

Figure 3

## Existing Transit Network

# ANALYSIS METHODOLOGY

Level of service is a qualitative measure of traffic operating conditions, whereby a letter grade, from A to F is assigned, based on quantitative measurements of delay per vehicle. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions, and LOS F represents severe delay under stop-and-go conditions.

## INTERSECTIONS

All study intersections were analyzed using Synchro traffic analysis software. Synchro applies the methodologies presented in the Transportation Research Board's *Highway Capacity Manual* (HCM) 2010.

### *Signalized Intersections*

Traffic operations at signalized intersections were evaluated using the LOS method described in the 2010 HCM. A signalized intersection's LOS is based on the weighted average control delay measured in seconds per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. Table 1 summarizes the relationship between the control delay and LOS for signalized intersections.

### *Unsignalized Intersections*

The 2010 HCM describes the method for evaluating LOS and delay at unsignalized (all-way stop controlled) intersections. LOS at unsignalized intersections is also defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. The average delay for the overall intersection is reported for all-way stop controlled intersections. Table 1 summarizes the relationship between delay and LOS for unsignalized intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections.

**TABLE 1**
**INTERSECTION LEVEL OF SERVICE CRITERIA**

| Level of Service | Description | Average Control Delay (seconds per vehicle) | |
|---|---|---|---|
| | | Signalized Intersections[1] | Unsignalized Intersections[2] |
| A | Represents free flow. Individual users are virtually unaffected by others in the traffic stream. | ≤ 10 | ≤ 10 |
| B | Stable flow, but the presence of other users in the traffic stream begins to be noticeable. | > 10 to 20 | > 10 to 15 |
| C | Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream. | > 20 to 35 | > 15 to 25 |
| D | Represents high-density, but stable flow. | > 35 to 55 | > 25 to 35 |
| E | Represents operating conditions at or near the capacity level. | > 55 to 80 | > 35 to 50 |
| F | Represents forced or breakdown flow. | > 80 | > 50 |

*Source: Highway Capacity Manual* (Transportation Research Board 2010).

## FREEWAY MAINLINE AND RAMPS

Freeway mainline (basic sections) and on- and off-ramps (merge and diverge sections) were analyzed using the LOS methodologies described in the 2010 HCM. Tables 2 and 3 present the LOS thresholds for freeway mainline sections and ramp merge and diverge sections, respectively.

**TABLE 2**
**FREEWAY MAINLINE LEVEL OF SERVICE**

| Level of Service | Description | Density (pcplpm)[1] |
|---|---|---|
| A | Represents free flow. Vehicles are almost completely unaffected in their ability to maneuver within the traffic stream. | ≤ 11 |
| B | Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted. | > 11 to 18 |
| C | Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. | > 18 to 26 |
| D | Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort. | > 26 to 35 |

**TABLE 2**
**FREEWAY MAINLINE LEVEL OF SERVICE**

| Level of Service | Description | Density (pcplpm)[1] |
|---|---|---|
| E | Operation at capacity. Virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing. | > 35 to 45 |
| F | Represents forced or breakdown flow. | > 45 |

Notes: 1. pcplpm = passenger cars per lane per mile
*Source: Highway Capacity Manual* (Transportation Research Board 2010).

**TABLE 3**
**RAMP MERGE AND DIVERGE LEVEL OF SERVICE CRITERIA**

| Level of Service | Description | Density (pcplpm)[1] |
|---|---|---|
| A | Represents free flow. Vehicles are almost completely unaffected in their ability to maneuver within the traffic stream. | ≤ 10 |
| B | Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted. | > 10 to 20 |
| C | Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. | > 20 to 28 |
| D | Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort. | > 28 to 35 |
| E | Operation at capacity. Virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing. | > 35 to 43 |
| F | Represents forced or breakdown flow. | > 43 |

Notes: 1. pcplpm = passenger cars per lane per mile
*Source: Highway Capacity Manual* (Transportation Research Board 2010).

## EXISTING TRAFFIC VOLUMES

Morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) mid-week peak period intersection turning movement volumes were collected at the study intersections. Turning movement volumes were collected on November 5, 2013, March 11, 2014, and May 8, 2014. On all three days weather conditions were generally clear and nearby schools were in session. Existing traffic volumes at the study intersections are shown on Figures 4A-4B. The raw traffic count data is provided in Appendix A. The counts revealed that the AM peak hour within the study area generally occurs between 7:45 and 8:45, and the PM peak hour generally occurs between 4:45 and 5:45. The PM peak hour experiences higher traffic volumes as commute traffic overlaps with retail/recreational traffic during this peak hour.

## EXISTING INTERSECTION OPERATIONS

Table 4 shows the existing delay and LOS results at the study intersections. The detailed technical calculations are provided in Appendix B.

**TABLE 4**
**INTERSECTION LEVEL OF SERVICE – EXISTING CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay[1] | LOS | Delay[1] | LOS |
| 1. Broadstone Parkway/East Bidwell Street | Traffic Signal | C | 17 | B | 26 | C |
| 2.Empire Ranch Road/Broadstone Parkway | All-Way Stop Control | C | 15 | B | 11 | B |
| 3. Broadstone Parkway/Iron Point Road | Traffic Signal | C | 11 | B | 18 | B |
| 4. East Bidwell Street/Iron Point Road | Traffic Signal | C | 30 | C | **52** | **D** |
| 5. Empire Ranch Road/Iron Point Road | All-Way Stop Control | C | 10 | A | 14 | B |
| 6. East Bidwell Street/Placerville Road | Traffic Signal | C | 14* | B* | 19* | B* |
| 7. Scott Road/US 50 Westbound Ramps | Traffic Signal | E | 11 | B | 23 | C |
| 8. Scott Road/US 50 Eastbound Ramps | Traffic Signal | E | 7 | A | 8 | A |
| 9. El Dorado Hills Blvd/US 50 Westbound Ramp | Traffic Signal | E | 46 | D | 39 | D |
| 10. Latrobe Road/US 50 Eastbound Ramp | Traffic Signal | E | 26* | C* | 10* | A* |
| 11. White Rock Road/Scott Road | Side-Street Stop Control | C | **35** | **E** | **35** | **E** |
| 12. White Rock Road/Placerville Road | Side-Street Stop Control | C | 21 | C | **32** | **D** |

**TABLE 4**
**INTERSECTION LEVEL OF SERVICE – EXISTING CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay[1] | LOS | Delay[1] | LOS |
| 13. Latrobe Road/White Rock Road | Traffic Signal | E | 23 | C | 29 | C |
| 14. Cavitt Drive/Iron Point Road | Traffic Signal | C | 9 | A | 15 | B |
| 15. Serpa Way/Iron Point Road | Traffic Signal | C | 14 | B | 14 | B |

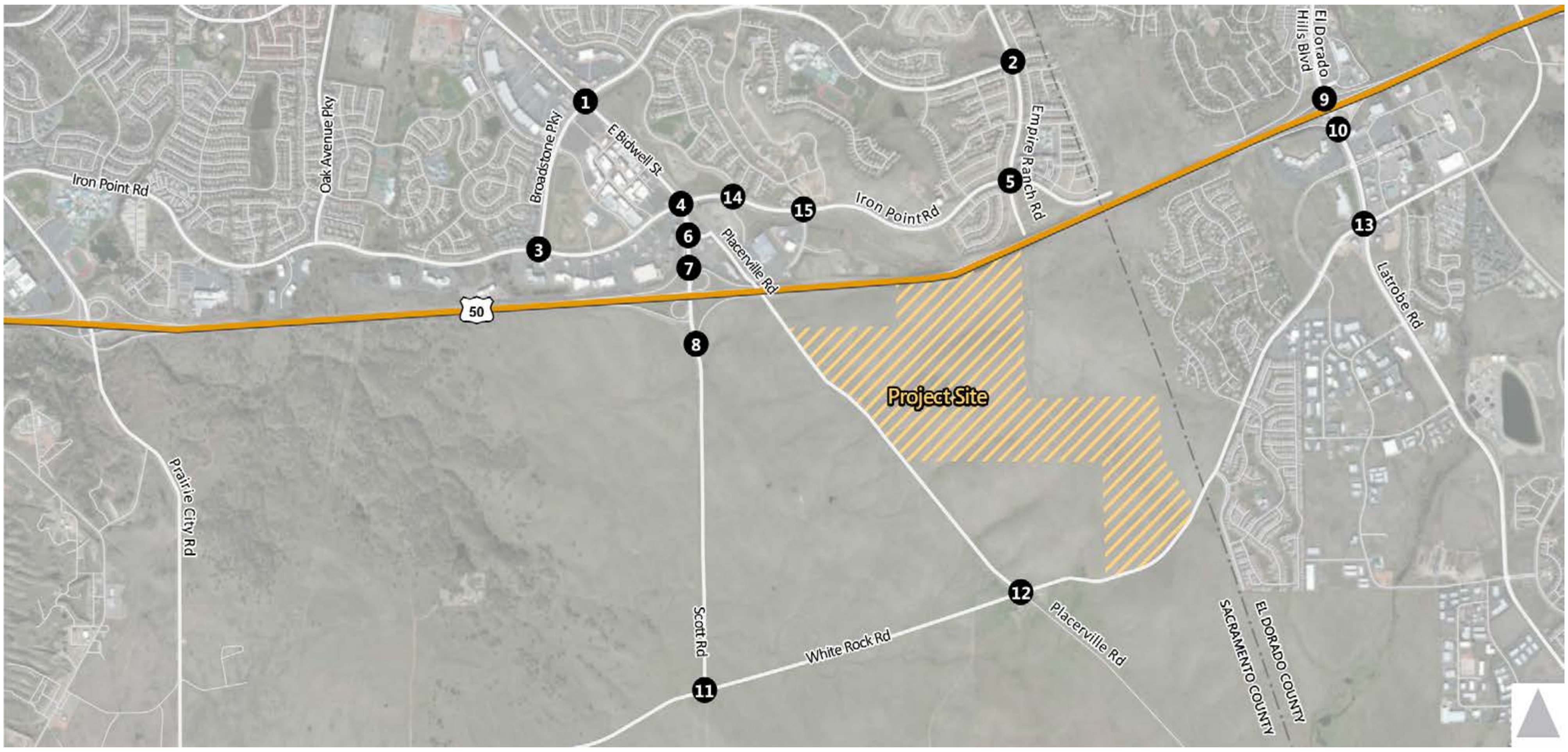
Note:
1. For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For side-street stop controlled intersections, the delay is reported in seconds per vehicle for the worst individual movement. All results are rounded to the nearest second.
* HCM 2000 used to analyze this intersection because HCM 2010 methodology only supports strict NEMA phasing.

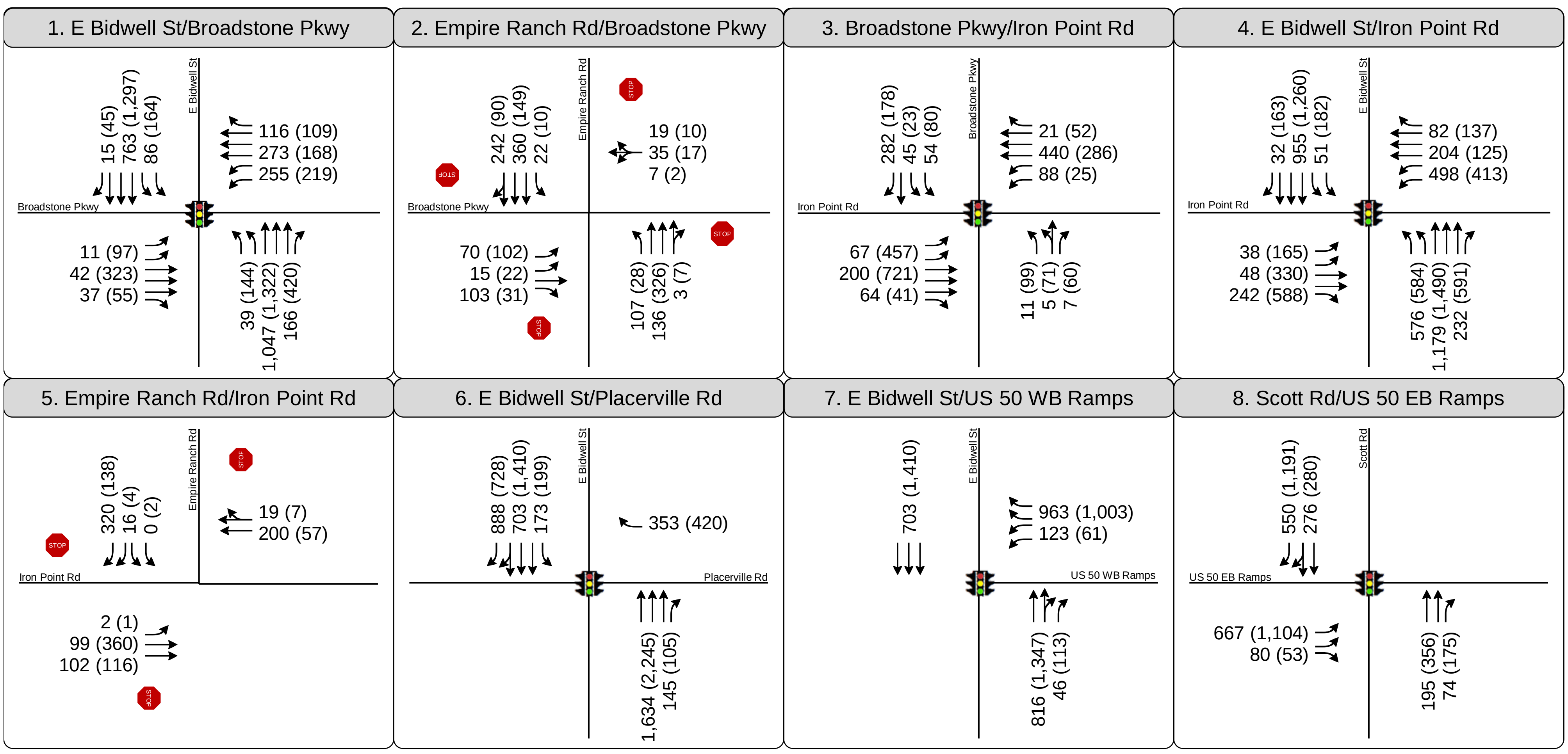
**Bold** indicates unacceptable operations.
*Source: Fehr & Peers, 2014*

As shown in Table 4, two side-side street stop controlled intersections on White Rock Road currently have individual movements that operate at LOS D or worse during at least one peak hour (White Rock Road/Scott Road and White Rock Road/Placerville Road). The signalized East Bidwell Street/Iron Point Road intersection operates at an average of LOS D during the PM peak hour, and the signalized El Dorado Hills Boulevard/US 50 Westbound Ramps intersection operates at an average of LOS D during both the AM and PM peak hours. The remainder of the study intersections currently operate at LOS C or better during both peak hours.

## EXISTING FREEWAY OPERATIONS

Existing freeway operations including basic, merge, and diverge sections were analyzed along US 50 within the study area. Table 5 summarizes the LOS results.




Study Intersections

Traffic Signal

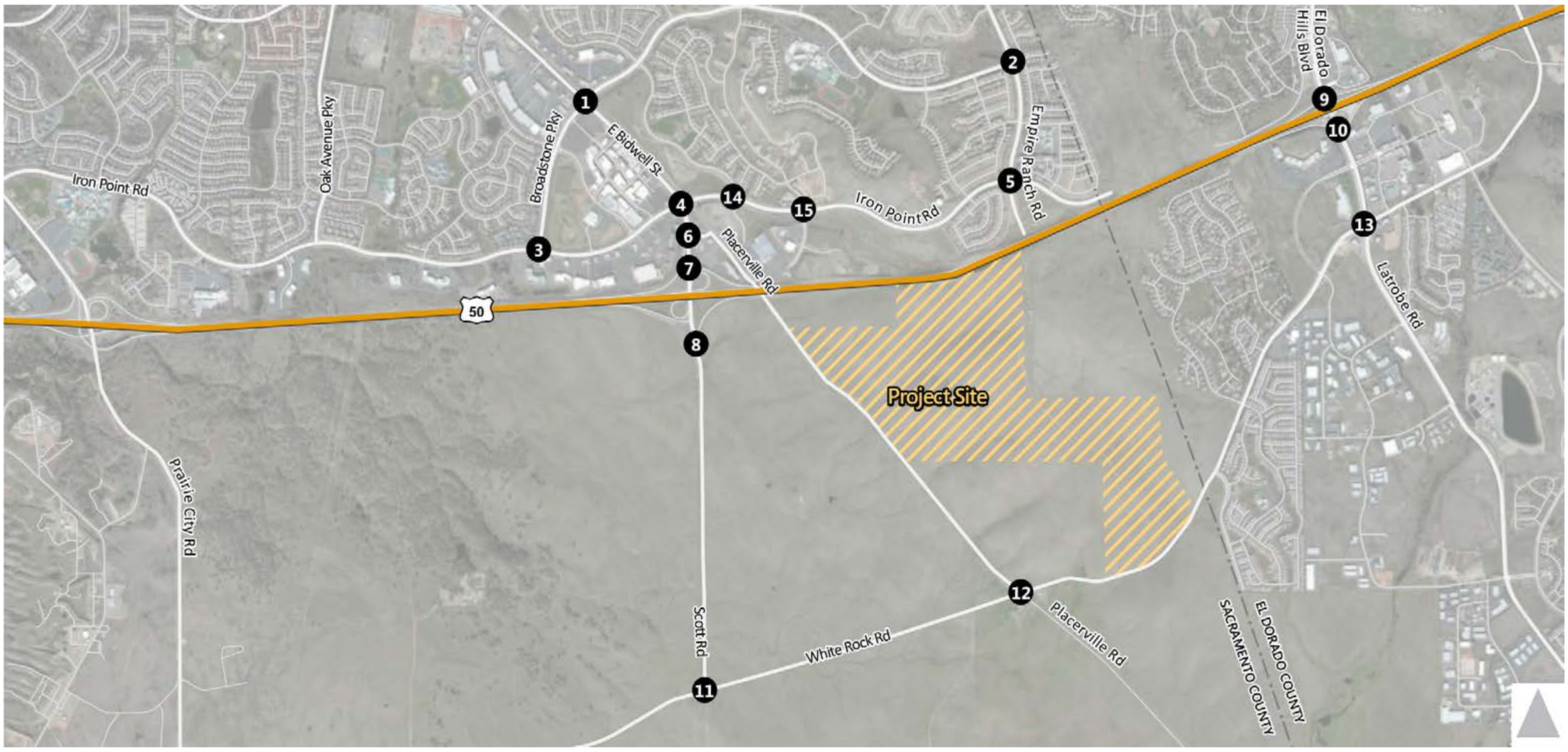
Stop Sign

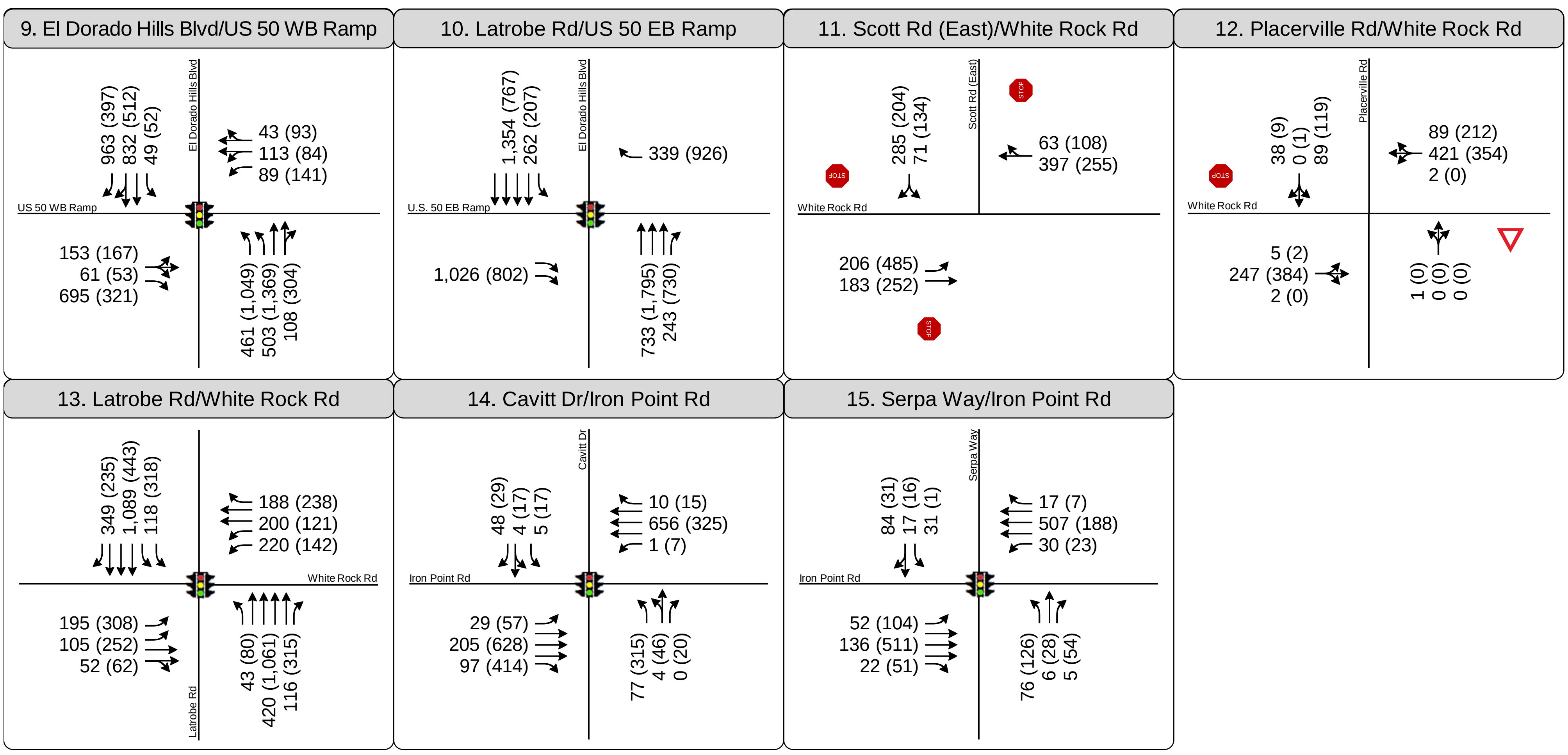
Turn Lane

AM (PM) Peak Hour Traffic Volume

Figure 4A

# Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions




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

Figure 4B

# Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

**TABLE 5**
**FREEWAY LEVEL OF SERVICE – EXISTING CONDITIONS**

| Direction | Location | Facility Type | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| Eastbound | US 50, West of Prairie City Rd. | Basic | 0.66 | 23.9 | C | 0.80 | 30.5 | D |
| | Prairie City Rd. Off-Ramp | Diverge | 0.75 | 29.1 | D | 0.95 | 36.7 | E |
| | US 50 between Prairie City Rd. Ramps | Basic | 0.52 | 18.9 | C | 0.72 | 26.6 | D |
| | Prairie City Rd. On-Ramp | Merge | 0.54 | 22.9 | C | 0.77 | 31.1 | D |
| | Prairie City Rd. On-Ramp II | Merge | 0.58 | 18.4 | B | 0.93 | 30.9 | D |
| | US 50, Prairie City Rd. to Scott Rd. | Basic | 0.47 | 17.1 | B | 0.96 | 41.3 | E |
| | Scott Rd. Off-Ramp | Diverge | 0.63 | 14.5 | B | **1.00** | - | **F** |
| | US 50 between Scott Rd. Ramps | Basic | 0.42 | 15.3 | B | 0.65 | 23.5 | C |
| | Scott Rd. Loop On-Ramp | Merge | 0.37 | 13.3 | B | 0.61 | 22.1 | C |
| | Scott Rd. On-Ramp II | Merge | 0.41 | 11.2 | B | 0.69 | 21.2 | C |
| | US 50, Scott Rd. to Latrobe Rd. (Segment I) | Basic | 0.46 | 16.5 | B | 0.76 | 28.3 | D |
| | US 50, Scott Rd. to Latrobe Rd. (Segment II) | Basic | 0.40 | 14.4 | B | 0.66 | 24.0 | C |
| | Latrobe Rd. Off-Ramp I | Diverge | 0.50 | 21.8 | C | 0.71 | 29.9 | D |
| | Latrobe Rd. Off-Ramp II | Diverge | 0.29 | 14.1 | B | 0.63 | 26.7 | C |
| | US 50 between Latrobe Rd. Ramps | Basic | 0.19 | 6.8 | A | 0.42 | 15.2 | B |
| | Latrobe Rd. On-Ramp | Merge | 0.30 | 14.2 | B | 0.60 | 24.8 | C |
| | US 50, East of Latrobe Rd. | Basic | 0.30 | 11.0 | B | 0.61 | 22.1 | C |
| Westbound | US 50, East of El Dorado Hills Blvd. | Basic | 0.86 | 33.7 | D | 0.53 | 19.3 | C |
| | El Dorado Hill Blvd Off-Ramp | Diverge | 0.88 | 36.4 | E | 0.57 | 24.7 | C |

**TABLE 5**
**FREEWAY LEVEL OF SERVICE – EXISTING CONDITIONS**

| Direction | Location | Facility Type | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| | US 50 between El Dorado Hills Blvd. Ramps | Basic | 0.62 | 22.4 | C | 0.40 | 14.5 | B |
| | El Dorado Hills Blvd. On-Ramp | Merge | 0.99 | 33.0 | D | 0.79 | 25.9 | C |
| | US 50, El Dorado Hills Blvd. to E. Bidwell Rd. (Segment I) | Basic | 0.88 | 35.6 | E | 0.71 | 26.2 | D |
| | US 50, El Dorado Hills Blvd. to E. Bidwell Rd. (Segment II) | Basic | 0.88 | 35.6 | E | 0.71 | 26.2 | D |
| | East Bidwell Off-Ramp | Diverge | 0.96 | 29.0 | D | 0.76 | 21.5 | C |
| | US 50 between E. Bidwell Rd. Ramps | Basic | 0.65 | 23.7 | C | 0.46 | 16.5 | B |
| | E. Bidwell Rd. Loop On-Ramp | Merge | 0.69 | 28.2 | D | 0.48 | 20.9 | C |
| | E. Bidwell Rd. On-Ramp II | Merge | 0.59 | 21.2 | C | 0.42 | 15.2 | B |
| | US 50, East Bidwell to Prairie City Rd. | Basic | 0.88 | 35.3 | E | 0.53 | 19.3 | C |
| | Prairie City Off-Ramp | Diverge | 0.91 | 37.5 | E | 0.66 | 28.1 | D |
| | US 50 between Prairie City Rd. Ramps | Basic | 0.68 | 25.0 | C | 0.55 | 19.9 | C |
| | Prairie City Rd. Loop On-Ramp | Merge | 0.71 | 28.9 | D | 0.57 | 24.1 | C |
| | Prairie City Rd. On-Ramp II | Merge | 0.87 | 28.1 | D | 0.76 | 23.9 | C |
| | US 50 west of Prairie City Rd. | Weave | 0.69 | 25.1 | C | 0.65 | 23.8 | C |

Notes: Merge, Diverge, and Basic Segments were analyzed using HCM 2010 methodology. Weave segments were analyzed with the Leisch Method. Weave segments that fell outside of the realm of weaving were analyzed using the HCM 2010 methodology.
1. v/c ratio = volume-to-capacity ratio
1. pcplpm = passenger cars per lane per mile
* Segment analyzed using Leisch Method (v/c ratio and pcplpm not provided).
**Segment fell outside of the realm of weaving and was analyzed using HCM 2010 methodology.
**Bold** indicates unacceptable operations.
*Source: Fehr & Peers, 2014.*

As shown in Table 5, the eastbound Scott Road off-ramp operates at LOS F during the PM peak hour. The *Transportation Corridor Concept Report, United States Highway 50* (Caltrans 2010), like all Caltrans transportation corridor or route concept reports, identifies long-range improvements for specific state highway corridors. These reports also establish the "concept" or desired LOS for specific corridor segments. The long-range improvements are identified to bring the existing facility up to the design concept expected to adequately serve 20-year traffic forecasts. In addition, the ultimate design concept for the facility is also identified for conditions beyond the immediate 20-year design period. The Route Concept Report for US 50 indicates that the 20-year concept level of service for this facility throughout the City of Folsom is LOS F. For this study, LOS E is applied as a conservative approach for identifying impacts to US 50 mainline, merge, and diverge facilities (i.e., LOS E or better is considered acceptable).

# REGULATORY SETTING

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

## FEDERAL REGULATIONS

There are no known federal plans, policies, regulations, or laws related to transportation and circulation that would affect the proposed project.

## STATE REGULATIONS

The California Department of Transportation (Caltrans) is responsible for planning, designing, constructing, operating, and maintaining all state-owned roadways in Sacramento County. Federal highway standards are implemented in California by Caltrans. Any improvements or modifications to the state highway system within the City of Folsom need to be approved by Caltrans. The City of Folsom does not have the ability to unilaterally make improvements to the state highway system.

### GUIDE FOR THE PREPARATION OF TRAFFIC IMPACT STUDIES

Caltrans' *Guide for the Preparation of Traffic Impact Studies* (December 2002) provides guidance on the evaluation of traffic impacts to State highway facilities. The document outlines when a traffic impact study is needed and what should be included in the scope of the study.

### TRANSPORTATION CONCEPT REPORT (US HIGHWAY 50)

The US Highway 50 Transportation Concept Report (Caltrans 2010) is a long range planning document that identifies existing route conditions and future needs, including existing and forecasted travel data and a concept level of service standard. The document addresses mobility need over the next 20 years.

### CORRIDOR SYSTEM MANAGEMENT PLAN (US HIGHWAY 50)

The *Highway 50 Corridor System Management* Plan (Caltrans 2009) contains the 20-year improvement concept for US 50 and forecasted LOS. For the segment of US 50 within the study area (Folsom Boulevard to Sacramento/El Dorado County Line), the ultimate facility concept is a ten lane freeway with four mainline lanes and one HOV lane in either direction. According to this document, the concept service level for this facility is LOS F because improvements necessary to achieve LOS E are not considered feasible due to environmental, right-of-way, financial, and other constraints.

## REGIONAL REGULATIONS

The Sacramento Area Council of Governments (SACOG) is an association of local governments from six counties and 22 cities within the Sacramento Region. The counties include El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba. SACOG is responsible for the preparation of, and updates to, the Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for the region and the corresponding Metropolitan Transportation Improvement Program (MTIP). The MTP/SCS provides a 20-year transportation vision and corresponding list of projects. The MTIP identifies short-term projects (seven-year horizon) in more detail. The 2035 MTP/SCS was adopted by the SACOG board in 2012.

### METROPOLITAN TRANSPORTATION PLAN/SUSTAINABLE COMMUNITIES STRATEGY (MTP/SCS)

The *2035 Metropolitan Transportation Plan/ Sustainable Communities Strategy (MTP/SCS)* is a long range plan for transportation improvements in the region. The plan is based on projections for growth in population, housing, and jobs.

## LOCAL REGULATIONS

### CITY OF FOLSOM GENERAL PLAN

The current City of Folsom *General Plan* (January 1993) is in the process of being updated, with expected completion in the fall of 2015. The General Plan is "a long term policy guide for the physical, economic, and environmental growth of the City. It is comprised of goals, policies, and implementation programs which are based on an assessment of current and future needs and available resources." Policy 17.17 of the City of Folsom *General Plan* specifies that the City will strive to achieve at least a LOS C throughout the City. This policy acknowledges that during build-out, temporarily worse LOS may occur where roadway improvements have not been adequately phased as development proceeds.

## EL DORADO COUNTY GENERAL PLAN

The current *El Dorado County General Plan* was adopted in July 2004, and serves as the "blueprint" for development within the County. The plan serves as the vehicle through which the "County addresses, balances, and fits together the competing interests and needs of its residents." General Plan Circulation Policy TC-Xd specifies LOS standards for County facilities, and details flexible criteria dependent upon the character of the area. Within "Community Regions," LOS E serves as the threshold, while a LOS D threshold applies within "Rural Centers" and "Rural Regions."

# IMPACTS AND MITIGATION MEASURES

The methods used to analyze the impacts of the project on the roadway, bicycle, pedestrian, and transit systems are provided in this section. The standards of significance to be used in identifying project-specific and cumulative impacts are presented. The standards are based on policies of the City of Folsom and other responsible agencies.

## THRESHOLDS OF SIGNIFICANCE

### CITY OF FOLSOM

Policy 17.17 of the City of Folsom *General Plan* specifies that the City will strive to achieve at least a LOS C throughout the City. This policy acknowledges that during build-out, temporarily worse LOS may occur where roadway improvements have not been adequately phased as City-wide development proceeds. For the purposes of this analysis, an impact is considered significant if implementation of the project would result in any of the following:

1. Cause an intersection in Folsom (outside of the Folsom Plan Area) that currently operates (or is projected to operate) at LOS C or better to degrade to LOS D or worse.
2. Cause an intersection within the Folsom Plan Area that currently operates (or is projected to operate) at LOS D or better to degrade to LOS E or worse.
3. Increase the average delay by five seconds or more at an intersection in Folsom (outside of the Folsom Plan Area) that currently operates (or is projected to operate) at an unacceptable LOS D, E, or F.
4. Increase the average delay by five seconds or more at an intersection in Folsom Plan Area that currently operates (or is projected to operate) at an unacceptable LOS E or F.
5. Add traffic to the US 50 freeway system (i.e., a ramp terminal intersection) that is already operating at LOS F.
6. Increase the volume to capacity ratio by 1% or more on a freeway mainline segment that is operating at an unacceptable level (LOS F).
7. Increase the density by 0.1 passenger cars per lane per mile or more on a freeway merge or diverge ramp that is operating at an unacceptable level (LOS F).
8. Eliminate or adversely affect an existing bikeway, pedestrian facility, or transit facility in a way that would discourage its use.

9. Interfere with the implementation of a planned bikeway or planned pedestrian facility, or be in conflict with a future transit facility.

10. Result in unsafe conditions for bicyclists or pedestrians including conflicts with other modes.

11. Result in demands to transit facilities greater than available capacity.

## EL DORADO COUNTY

El Dorado County General Plan Circulation Policy TC-Xd provides LOS standards for County-maintained roads and state highways as follows[1]:

- 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.
- 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 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 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.

For the purposes of this study, all three study intersections located within El Dorado County (intersection numbers 9, 10, and 13) are located within a “Community Region;” therefore, the LOS E thresholds applies.

[1] *El Dorado County Department of Transportation’s Traffic Impact Study Protocols and Procedures*

# METHOD OF ANALYSIS

## PROJECT TRAVEL FORECASTS

Trips associated with the proposed project were assigned to the transportation system using the following four-step process, applied using a modified version of the SACMET regional travel demand model, developed and maintained by SACOG:

1. Trip generation – Estimated the number of trips entering and exiting the project components based on planned land uses and connectivity variables.
2. Trip distribution – The approach and departure paths from the project site were forecasted.
3. Mode split – The proportion of trips using each travel mode (i.e., motor vehicle, transit, bicycle, and walk) was determined.
4. Trip assignment – Assigned trips generated by the proposed project to study area roadways, and applied a process known as "difference method," which accounts for potential inaccuracies in the base year model.

The results of this process are described in detail below.

## PROJECT TRIP GENERATION

To analyze potential transportation impacts associated with implementation of the proposed project, Fehr & Peers utilized a modified version of the SACMET regional travel demand model (base year MTP/SCS version) to forecast travel demand within study area. This model accounts for project characteristics including mix of densities and neighborhood connectivity. The model is also sensitive to land use and demographic variables including mix of housing types, household size, and income levels. The model applies locally valid trip rates developed by SACOG and based upon household travel survey data collected in the Sacramento region. The project would contain the following trip-generating land uses:

- Single-Family Residential: 761 dwelling units
- Multi-Family Residential: 114 dwelling units

The above land uses and the proposed transportation network for the project were coded into the SACMET model. Table 6 summarizes the proposed project's resulting trip generation estimate. As shown in Table 6, it is estimated that the project will generate over 8,000 daily trips with over 700 trips occurring during the AM and PM peak hours.

**TABLE 6**
**PROJECT TRIP GENERATION**

| | Trip Generation Rates Per Dwelling Unit | | | Trips | | |
|---|---|---|---|---|---|---|
| | Daily | AM Peak Hour | PM Peak Hour | Daily | AM Peak Hour | PM Peak Hour |
| Total Project Trips | 9.57 | 0.84 | 0.84 | 8,373 | 737 | 735 |

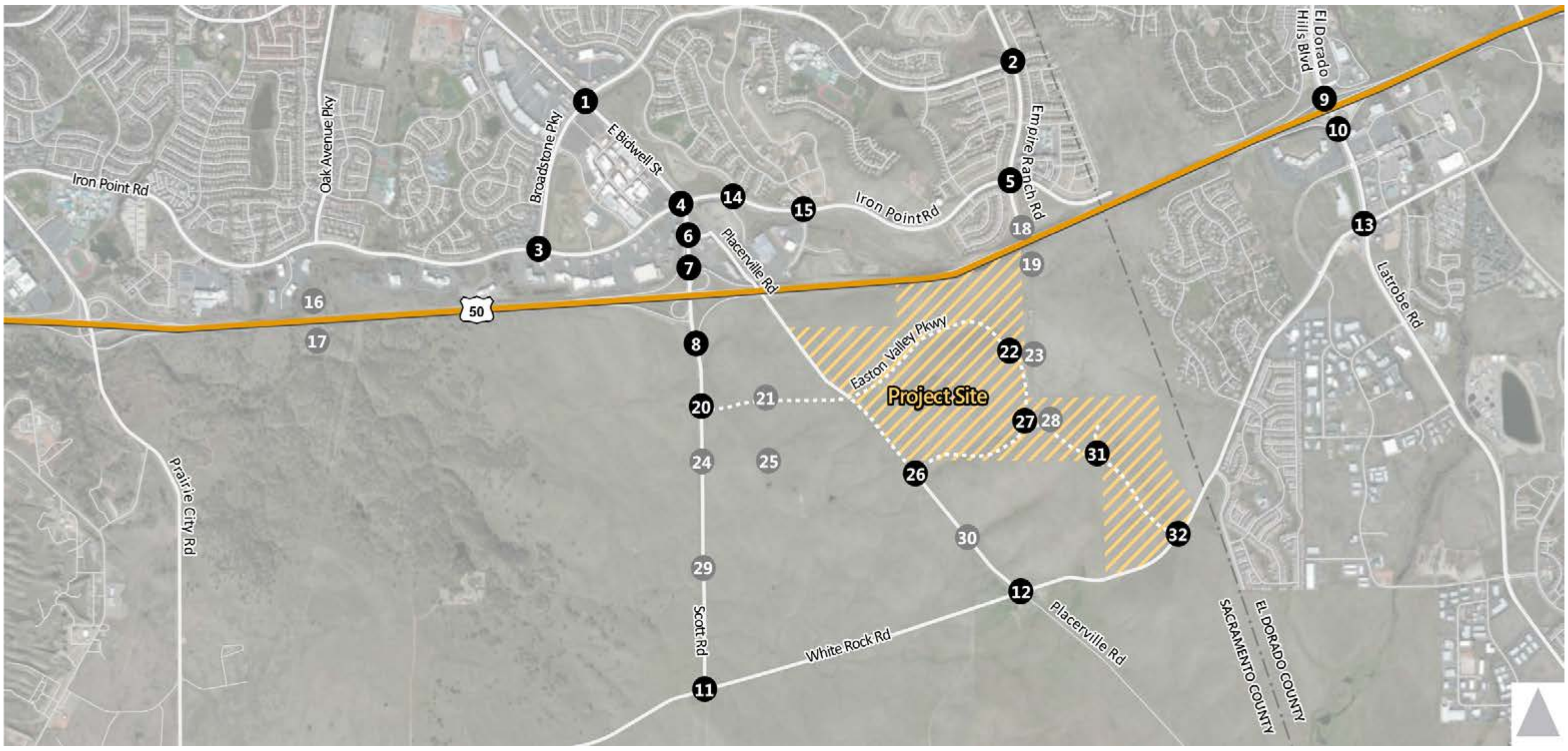
Note:
Trips estimated using output from the SACMET regional travel demand model (SACOG 2012).
*Source: Fehr & Peers, 2014.*

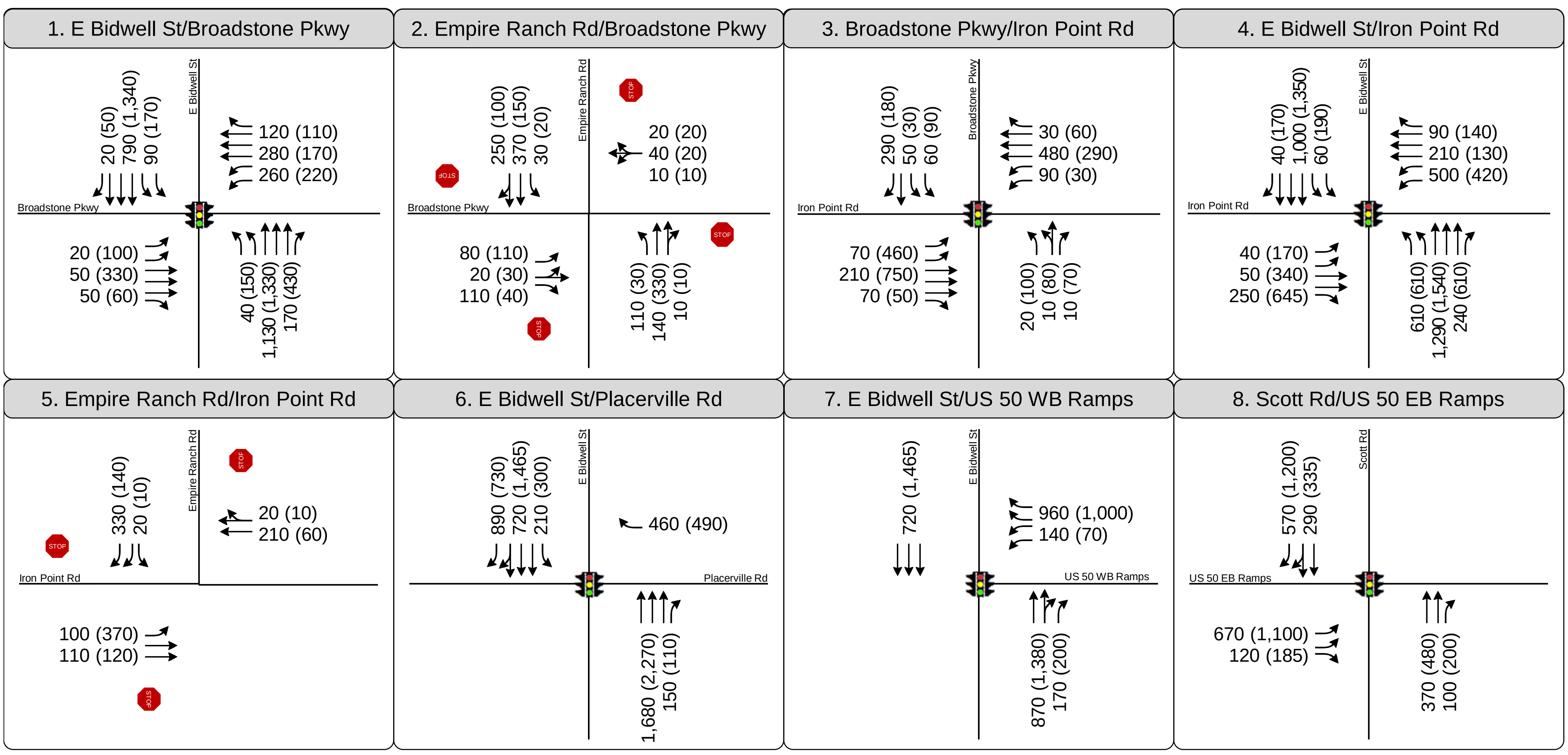
## PROJECT TRIP DISTRIBUTION AND MODE SPLIT

The base year version of SACMET travel demand model was used to estimate the distribution of project trips for the Existing Plus Project scenario. In addition to forecasting the number of trips associated with the proposed project, as discussed previously, the model distributes inbound and outbound project trips onto the transportation network, and accounts for changes to travel patterns within the study area as a result of the project. The model also accounts for trips made by non-auto travel modes, including walking, bicycling, and transit based on the land use and transportation network characteristics of the study area.

## TRIP ASSIGNMENT

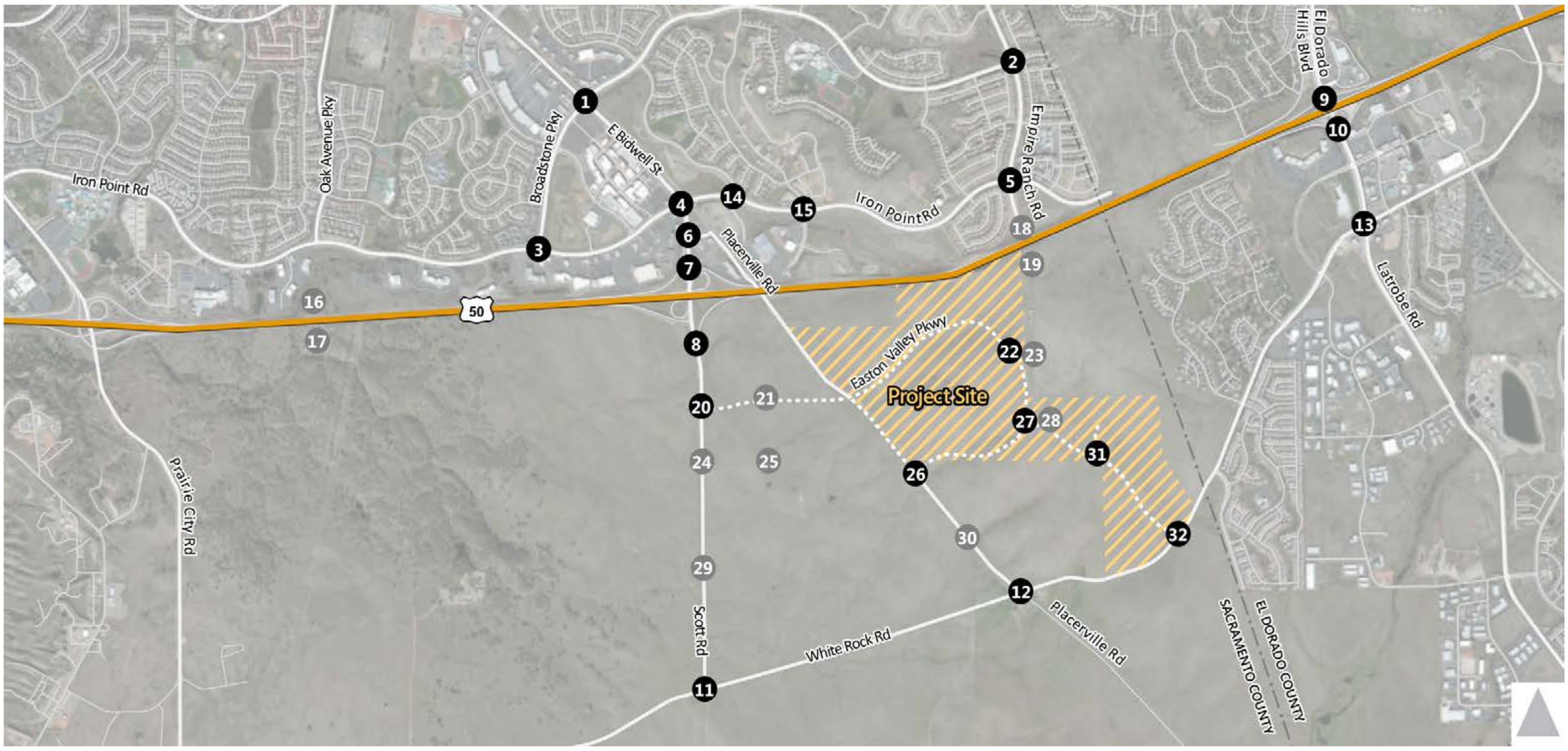
In accordance with the projected trip generation and distribution estimates, project trips were assigned to the transportation system using the SACMET model. Figures 5A-5D display the resulting Existing Plus Project traffic volumes at each of the study intersections, and shows the locations of key roadways that would be constructed as part of the project. As shown in Figures 5A-5D, in addition to roadways internal to the project site, implementation of the proposed project would also include construction of the segment of Easton Valley Parkway located between Scott Road and Placerville Road. The trip assignment, and resulting Existing Plus Project forecasts account for the construction of this roadway segment.

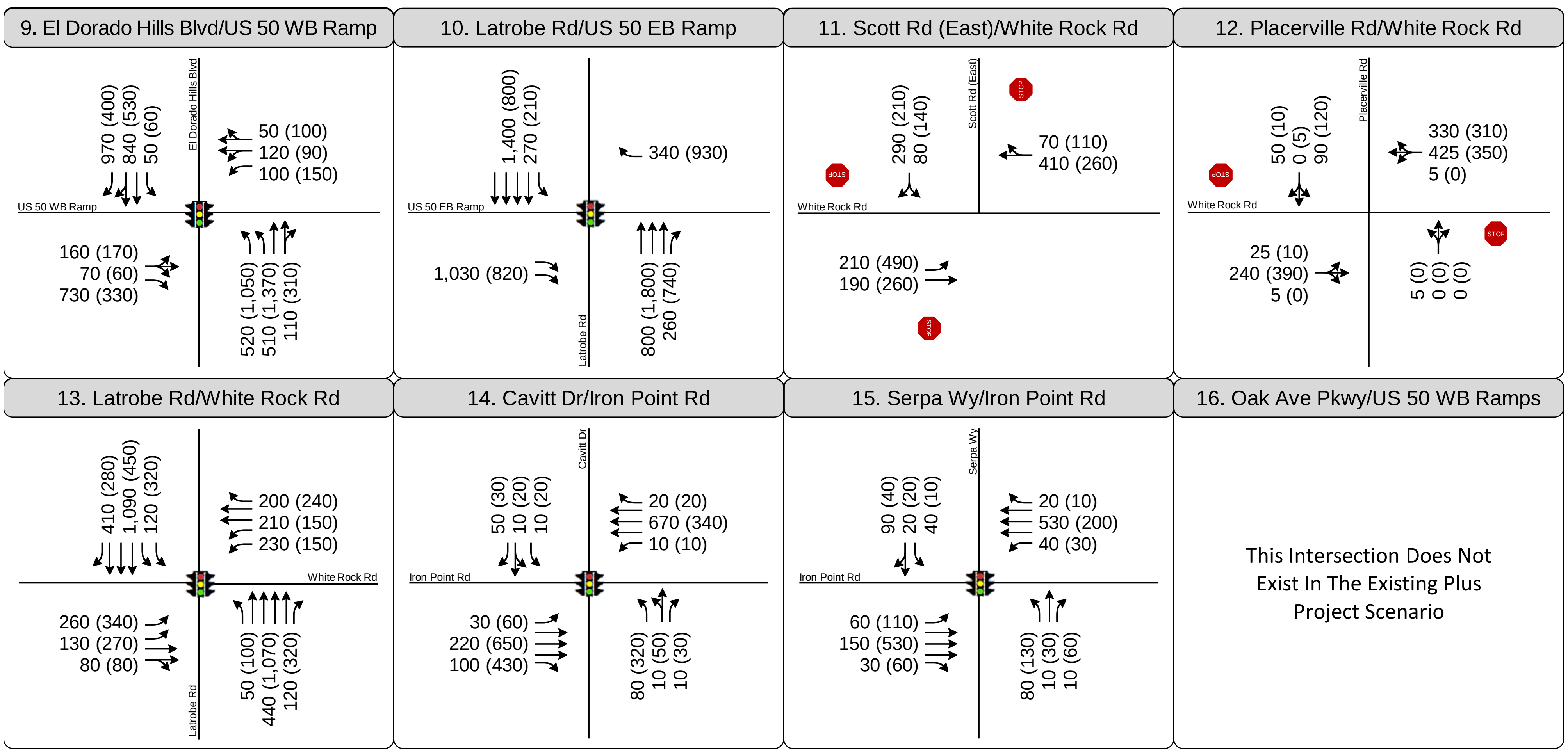



Study Intersections — Turn Lane
Traffic Signal — AM (PM) Peak Hour Traffic Volume
Stop Sign

Figure 5A
Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project




Study Intersections

Traffic Signal

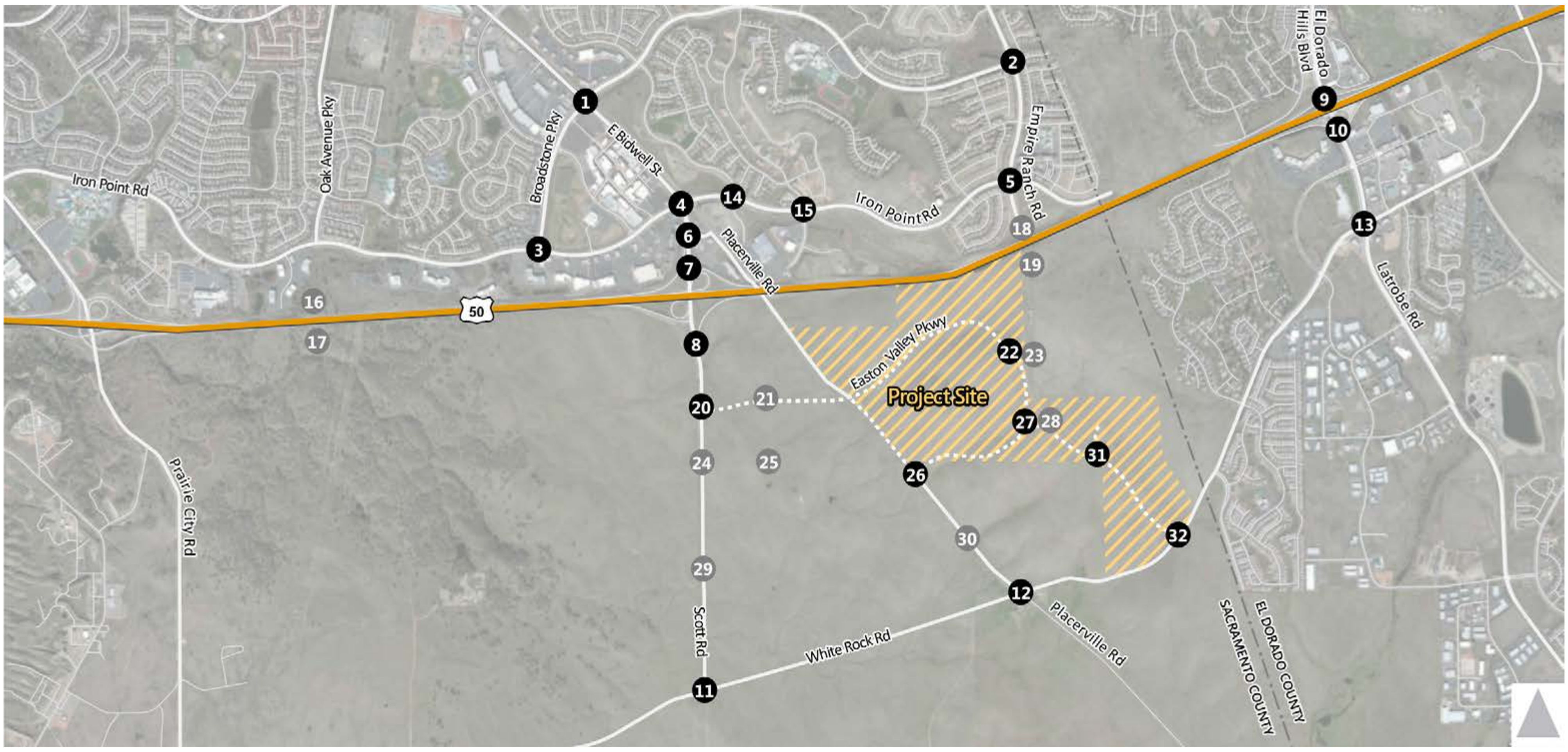
Stop Sign

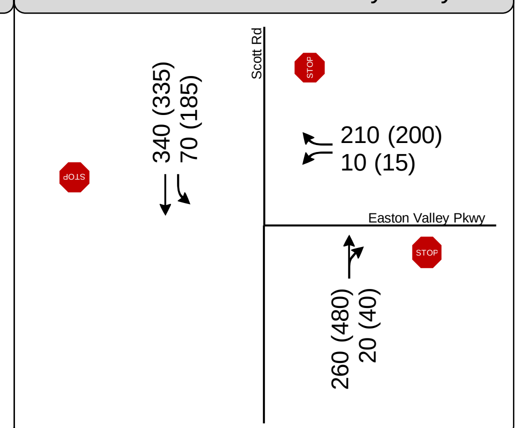
Turn Lane

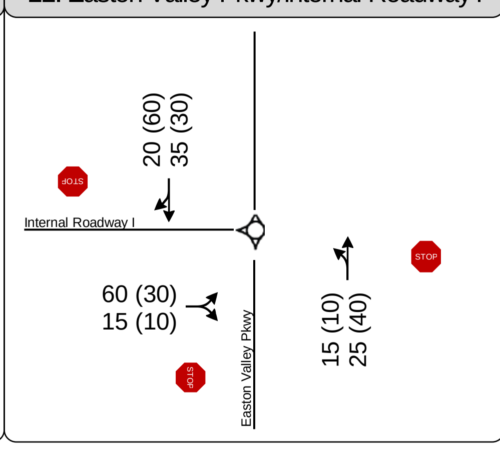
AM (PM) Peak Hour Traffic Volume

Figure 5B

# Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project



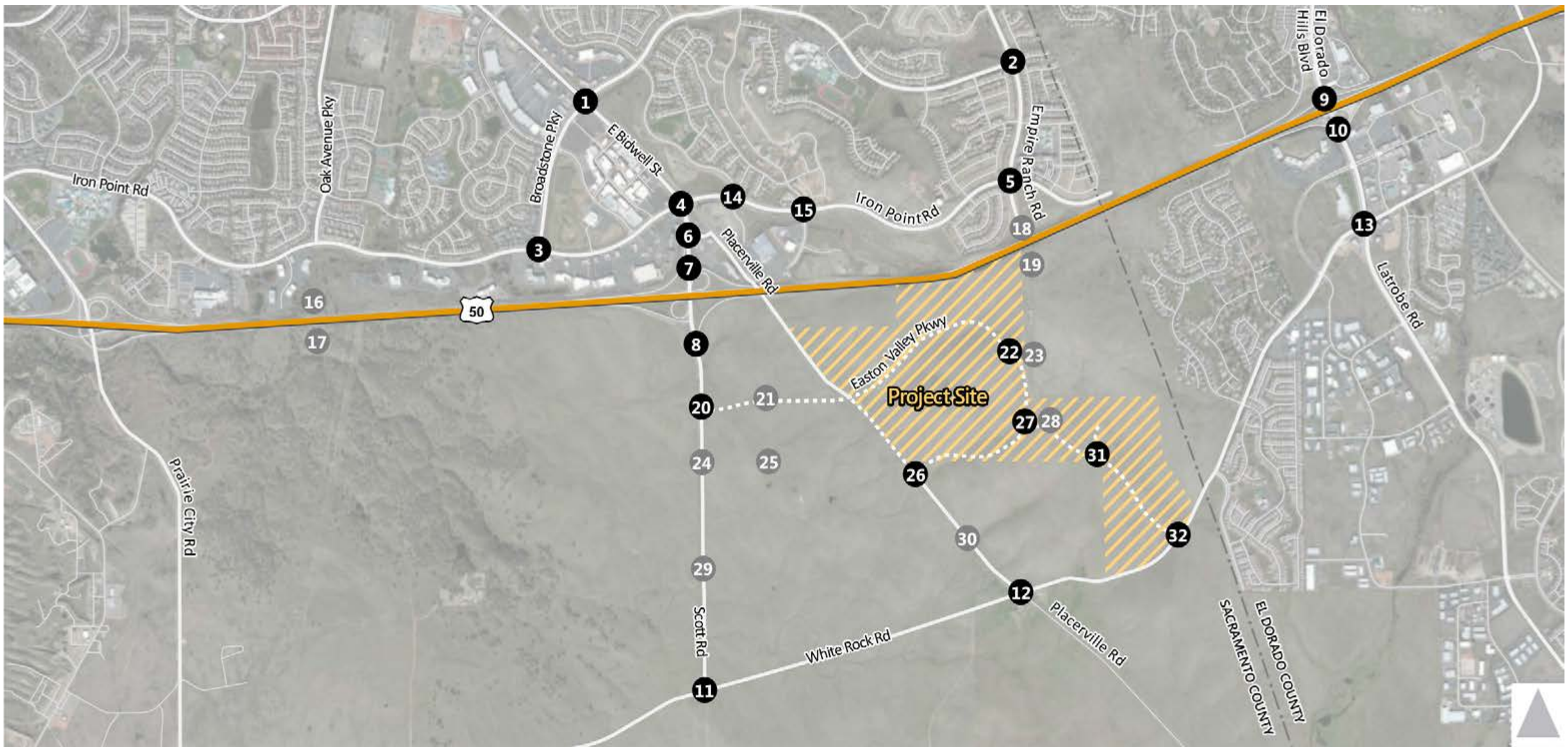

| 17. Oak Ave Pkwy/US 50 EB Ramps | 18. Empire Ranch Rd/US 50 WB Ramps | 19. Empire Ranch Rd/US 50 EB Ramps | 20. Scott Rd/Easton Valley Pkwy |
|---|---|---|---|
| This Intersection Does Not Exist In The Existing Plus Project Scenario | This Intersection Does Not Exist In The Existing Plus Project Scenario | This Intersection Does Not Exist In The Existing Plus Project Scenario |   |

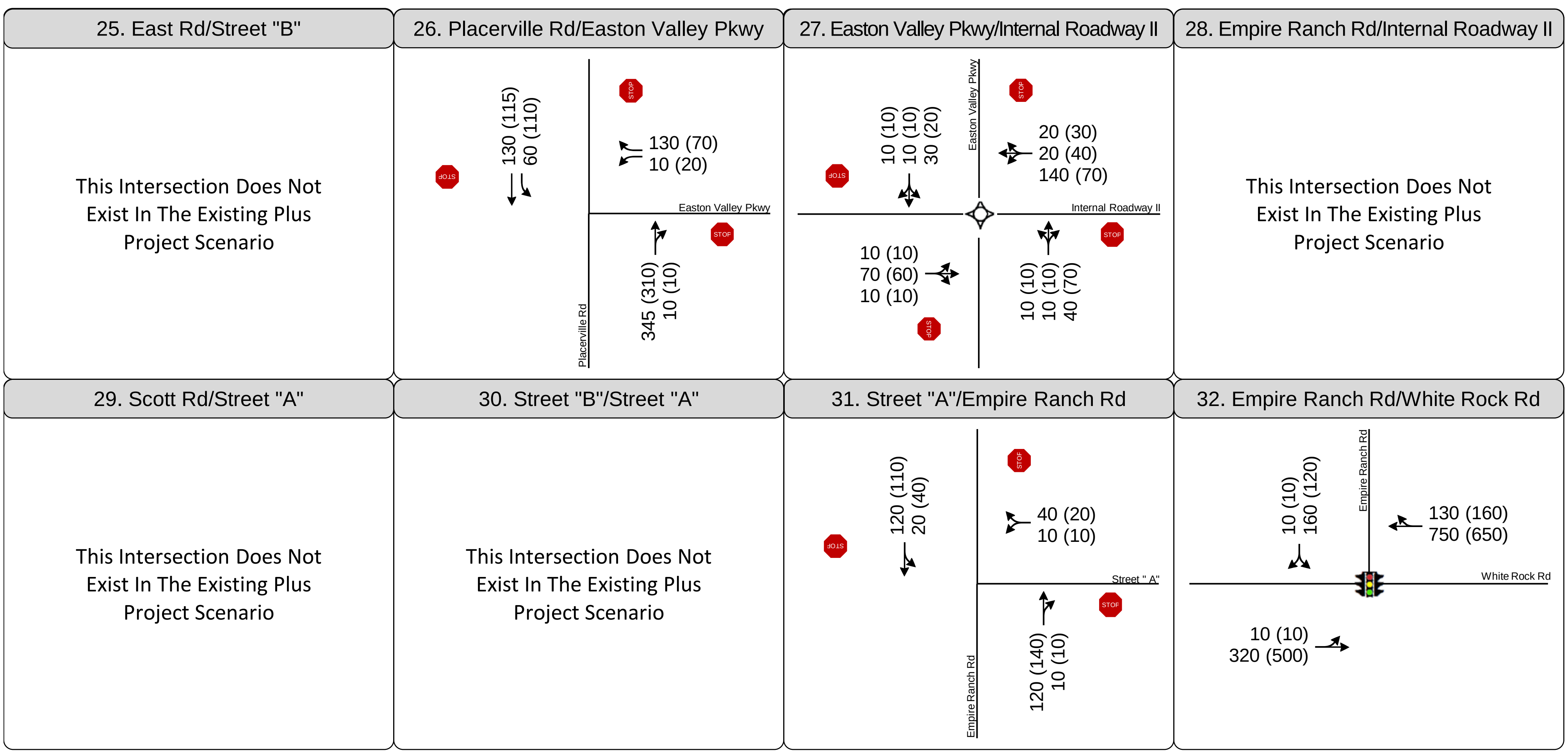
| 21. Placerville Rd/Easton Valley Pkwy | 22. Easton Valley Pkwy/Internal Roadway I | 23. Empire Ranch Rd/Internal Roadway I | 24. Scott Rd/Street "B" |
|---|---|---|---|
| This Intersection Does Not Exist In The Existing Plus Project Scenario |   | This Intersection Does Not Exist In The Existing Plus Project Scenario | This Intersection Does Not Exist In The Existing Plus Project Scenario |

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

Figure 5C

# Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project




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

Figure 5D

# Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project

# PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

The proposed project impacts on the transportation system are evaluated in this section based on the thresholds of significance and analysis results. Each impact is followed by a recommended mitigation measure to reduce the significance of identified impacts, if needed.

**Impact 1: The proposed project could cause potentially significant impacts to study intersections.**

Project trips were assigned to the study facilities in accordance with the trip generation and distribution assumptions described previously. Table 7 summarizes the existing plus project LOS results at the study intersections (refer to Appendix B for detailed technical calculations).

**TABLE 7**
**INTERSECTION LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS | Existing | | | | Existing Plus Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| 1. Broadstone Parkway/ East Bidwell Street | Traffic Signal | C | 17 | B | 26 | C | 18 | B | 26 | C |
| 2.Empire Ranch Road/ Broadstone Parkway | All-Way Stop Control | C | 15 | B | 11 | B | 16 | C | 11 | B |
| 3. Broadstone Parkway/ Iron Point Road | Traffic Signal | C | 11 | B | 18 | B | 12 | B | 19 | B |
| 4. East Bidwell Street/ Iron Point Road | Traffic Signal | C | 30 | C | **52** | **D** | 31 | C | **60** | **E** |
| 5. Empire Ranch Road/ Iron Point Road | All-Way Stop Control | C | 10 | A | 14 | B | 10 | A | 14 | B |
| 6. East Bidwell Street/ Placerville Road | Traffic Signal | C | 14* | B* | 19* | B* | 18* | B* | 23* | C* |

**TABLE 7**
**INTERSECTION LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS | Existing | | | | Existing Plus Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| 7. Scott Road/ US 50 Westbound Ramps | Traffic Signal | E | 11 | B | 23 | C | 12 | B | 24 | C |
| 8. Scott Road/ US 50 Eastbound Ramps | Traffic Signal | E | 7 | A | 8 | A | 7 | A | 9 | A |
| 9. El Dorado Hills Blvd/ US 50 Westbound Ramp | Traffic Signal | E | 46 | D | 39 | D | 50 | D | 40 | D |
| 10. Latrobe Road/ US 50 Eastbound Ramp | Traffic Signal | E | 26* | C* | 10* | A* | 26* | C* | 24* | C* |
| 11. White Rock Road/ Scott Road | All-Way Stop Control | C | **35** | **E** | **35** | **E** | **38** | **E** | **36** | **E** |
| 12. White Rock Road/ Placerville Road | Side-Street Stop Control | C | 21 | C | 32 | D | 31 | D | **40** | **E** |
| 13. Latrobe Road/ White Rock Road | Traffic Signal | C | 23 | C | 29 | C | 26 | C | 31 | C |
| 14. Cavitt Drive/ Iron Point Road | Traffic Signal | C | 9 | A | 15 | B | 10 | B | 15 | B |
| 15. Serpa Way/ Iron Point Road | Traffic Signal | C | 14 | B | 14 | B | 15 | B | 15 | B |
| 20. Scott Road/ Easton Valley Parkway | All-Way Stop Control | C | N/A | N/A | N/A | N/A | 14 | B | 27 | D |
| 22. Easton Valley Parkway/ Internal Roadway I | Roundabout | C | N/A | N/A | N/A | N/A | 4 | A | 4 | A |
| 26. Placerville Road/ Easton Valley Parkway | All-Way Stop Control | C | N/A | N/A | N/A | N/A | 12 | B | 11 | B |

**TABLE 7**
**INTERSECTION LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS | Existing | | | | Existing Plus Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| 27. Internal Roadway II/ Easton Valley Parkway | Roundabout | C | N/A | N/A | N/A | N/A | 5 | A | 5 | A |
| 31. Empire Ranch Rd/ Street "A" | All-Way Stop Control | C | N/A | N/A | N/A | N/A | 8 | A | 8 | A |
| 32. Empire Ranch Rd/ White Rock Rd | Traffic Signal | C | N/A | N/A | N/A | N/A | 9 | A | 7 | A |

Note:
1. For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For side-street stop controlled intersections, the delay is reported in seconds per vehicle for the worst individual movement. All results are rounded to the nearest second.
* HCM 2000 used to analyze this intersection because HCM 2010 methodology only supports strict NEMA phasing.

**Bold** indicates unacceptable operations.
**Bold** indicates significant impact.
*Source: Fehr & Peers, 2014*

As shown in Table 7, with implementation of the proposed project, the delay at the East Bidwell Street/Iron Point Road intersection would increase by more than five seconds during the PM peak hour. Additionally, the White Rock Road/Placerville Road intersection would deteriorate from LOS D to unacceptable LOS E during the PM peak hour.

Implementation of the proposed project would result in significant impacts to the intersections of East Bidwell Street/Iron Point Road and White Rock Road/Placerville Road.

Mitigation Measure(s)

East Bidwell Street / Iron Point Road: Modify westbound approach to include three left-turn lanes, two through lanes, and one right-turn lane to lower delay to existing conditions during the PM peak hour. This will reduce the impact to less-than-significant and improve the LOS at the East Bidwell Street/Iron Point Road intersection to the following:

- PM Peak Hour: Delay – 52 seconds/vehicle, LOS D

*Mitigation 1A* *Project applicant will pay a fair share fee towards the following improvements to the Iron Point Road/East Bidwell Street intersection: Modify westbound approach to include three left-turn lanes, two through lanes, and one right-turn lane.*

<u>White Rock Road / Placerville Road</u>: During the PM peak hour, the addition of a westbound right-turn lane to the White Rock Road/Placerville Road intersection would result in acceptable operations and would therefore reduce this impact to less-than-significant. This mitigation would improve the LOS at the White Rock Road / Placerville Road intersection to the following:

- PM Peak Hour: Delay – 26 seconds/vehicle, LOS D

*Mitigation 1B* *Project applicant will pay a fee towards the following improvements to the White Rock Road/Placerville Road intersection: Add a westbound right-turn lane.*

Implementation of this mitigation measure would reduce this impact to **less-than-significant**.

**Impact 2:** **The proposed project could cause potentially significant impacts to study freeway facilities.**

Project trips were assigned to the study facilities in accordance with the trip generation and distribution assumptions described previously. Table 8 shows the existing plus project level of service results for the study freeway facilities. The technical calculations are provided in Appendix D.

**TABLE 8**
**FREEWAY LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS**

| Direction | Location | Facility Type | Existing Conditions | | | | | | Existing Plus Project Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| Eastbound | US 50, West of Prairie City Rd. | Basic | 0.66 | 23.9 | C | 0.80 | 30.5 | D | 0.66 | 24.0 | C | 0.80 | 30.7 | D |
| | Prairie City Rd. Off-Ramp | Diverge | 0.75 | 29.1 | D | 0.95 | 36.7 | E | 0.76 | 29.3 | D | 0.96 | 36.8 | E |
| | US 50 between Prairie City Rd. Ramps | Basic | 0.52 | 18.9 | C | 0.72 | 26.6 | D | 0.52 | 18.7 | C | 0.73 | 26.9 | D |
| | Prairie City Rd. On-Ramp | Merge | 0.54 | 22.9 | C | 0.77 | 31.1 | D | 0.53 | 22.8 | C | 0.77 | 31.3 | D |
| | Prairie City Rd. On-Ramp II | Merge | 0.58 | 18.4 | B | 0.93 | 30.9 | D | 0.57 | 18.1 | B | 0.96 | 31.8 | D |
| | US 50, Prairie City Rd. to Scott Rd. | Basic | 0.47 | 17.1 | B | 0.96 | 41.3 | E | 0.47 | 16.8 | B | 0.98 | 43.5 | E |
| | Scott Rd. Off-Ramp | Diverge | 0.63 | 14.5 | B | 1.00 | - | F | 0.62 | 14.1 | B | **1.03** | **-** | **F** |
| | US 50 between Scott Rd. Ramps | Basic | 0.42 | 15.3 | B | 0.65 | 23.5 | C | 0.30 | 10.9 | A | 0.65 | 23.5 | C |
| | Scott Rd. Loop On-Ramp | Merge | 0.37 | 13.3 | B | 0.61 | 22.1 | C | 0.39 | 14.1 | B | 0.61 | 22.1 | C |
| | Scott Rd. On-Ramp II | Merge | 0.41 | 11.2 | B | 0.69 | 21.2 | C | 0.46 | 12.7 | B | 0.70 | 21.4 | C |
| | US 50, Scott Rd. to Latrobe Rd. (Segment I) | Basic | 0.46 | 16.5 | B | 0.76 | 28.3 | D | 0.49 | 17.8 | B | 0.76 | 28.5 | D |
| | US 50, Scott Rd. to Latrobe Rd. (Segment II) | Basic | 0.40 | 14.4 | B | 0.66 | 24.0 | C | 0.43 | 15.5 | B | 0.66 | 24.2 | C |
| | Latrobe Rd. Off-Ramp I | Diverge | 0.50 | 21.8 | C | 0.71 | 29.9 | D | 0.53 | 22.9 | C | 0.71 | 30.0 | D |
| | Latrobe Rd. Off-Ramp II | Diverge | 0.29 | 14.1 | B | 0.63 | 26.7 | C | 0.33 | 15.3 | B | 0.63 | 26.7 | C |

**TABLE 8**
**FREEWAY LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS**

| Direction | Location | Facility Type | Existing Conditions | | | | | | Existing Plus Project Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| | US 50 between Latrobe Rd. Ramps | Basic | 0.19 | 6.8 | A | 0.42 | 15.2 | B | 0.22 | 7.9 | A | 0.42 | 15.2 | B |
| | Latrobe Rd. On-Ramp | Merge | 0.24 | 12.0 | B | 0.56 | 23.2 | C | 0.27 | 13.1 | B | 0.56 | 23.3 | C |
| | US 50, East of Latrobe Rd. | Basic | 0.26 | 9.3 | A | 0.58 | 20.8 | C | 0.30 | 10.7 | A | 0.58 | 21.0 | C |
| Westbound | US 50, East of El Dorado Hills Blvd. | Basic | 0.86 | 33.7 | D | 0.53 | 19.3 | C | 0.86 | 33.6 | D | 0.54 | 19.5 | C |
| | El Dorado Hill Blvd Off-Ramp | Diverge | 0.88 | 36.4 | E | 0.57 | 24.7 | C | 0.88 | 36.4 | E | 0.58 | 24.9 | C |
| | US 50 between El Dorado Hills Blvd. Ramps | Basic | 0.62 | 22.4 | C | 0.40 | 14.5 | B | 0.61 | 22.0 | C | 0.40 | 14.5 | B |
| | El Dorado Hills Blvd. On-Ramp | Merge | 0.99 | 33.0 | D | 0.79 | 25.9 | C | 1.00 | 33.2 | D | 0.79 | 26.0 | C |
| | US 50, El Dorado Hills Blvd. to E. Bidwell Rd. (Segment I) | Basic | 0.88 | 35.6 | E | 0.71 | 26.2 | D | 0.89 | 35.8 | E | 0.72 | 26.3 | D |
| | US 50, El Dorado Hills Blvd. to E. Bidwell Rd. (Segment II) | Basic | 0.88 | 35.6 | E | 0.71 | 26.2 | D | 0.89 | 35.8 | E | 0.72 | 26.3 | D |
| | East Bidwell Off-Ramp | Diverge | 0.96 | 29.0 | D | 0.76 | 21.5 | C | 0.96 | 29.2 | D | 0.76 | 21.6 | C |
| | US 50 between E. Bidwell Rd. Ramps | Basic | 0.65 | 23.7 | C | 0.46 | 16.5 | B | 0.66 | 23.8 | C | 0.46 | 16.6 | B |
| | E. Bidwell Rd. Loop On-Ramp | Merge | 0.69 | 28.2 | D | 0.48 | 20.9 | C | 0.72 | 29.2 | D | 0.51 | 21.6 | C |
| | E. Bidwell Rd. On-Ramp II | Merge | 0.59 | 21.2 | C | 0.42 | 15.2 | B | 0.60 | 21.8 | C | 0.43 | 15.6 | B |

**TABLE 8**
**FREEWAY LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS**

| Direction | Location | Facility Type | Existing Conditions | | | | | | Existing Plus Project Conditions | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| | US 50, East Bidwell to Prairie City Rd. | Basic | 0.88 | 35.3 | E | 0.53 | 19.3 | C | 0.91 | 37.2 | E | 0.55 | 19.9 | C |
| | Prairie City Off-Ramp | Diverge | 0.91 | 37.5 | E | 0.66 | 28.1 | D | 0.94 | 38.6 | E | 0.68 | 28.9 | D |
| | US 50 between Prairie City Rd. Ramps | Basic | 0.68 | 25.0 | C | 0.55 | 19.9 | C | 0.71 | 26.1 | D | 0.57 | 20.6 | C |
| | Prairie City Rd. Loop On-Ramp | Merge | 0.71 | 28.9 | D | 0.57 | 24.1 | C | 0.73 | 29.8 | D | 0.59 | 24.8 | C |
| | Prairie City Rd. On-Ramp II | Merge | 0.87 | 28.1 | D | 0.76 | 23.9 | C | 0.91 | 29.3 | D | 0.78 | 24.6 | C |
| | US 50 west of Prairie City Rd. | Weave | 0.69 | 25.1 | C | 0.65 | 23.8 | C | 0.71 | 26.2 | D | 0.67 | 24.5 | C |

Notes: Merge, Diverge, and Basic Segments were analyzed using HCM 2010 methodology. Weave segments were analyzed with the Leisch Method. Weave segments that fell outside of the realm of weaving were analyzed using the HCM 2010 methodology.
1. v/c ratio = volume-to-capacity ratio
2. pcplpm = passenger cars per lane per mile
* Segment analyzed using Leisch Method (v/c ratio and pcplpm not provided).
**Segment fell outside of the realm of weaving and was analyzed using HCM 2010 methodology.
**Bold** indicates unacceptable operations.
**Shaded** indicates significant impact.
*Source: Fehr & Peers, 2014.*

As shown in Table 8, the project will increase the v/c ratio of the eastbound Scott Road off-ramp during the PM peak hour. The project will add traffic to these sections that are currently over capacity.

The project would cause a ***significant and unavoidable*** impact to the study freeway facilities under existing plus project conditions.

Mitigation Measure(s)

*Mitigation 2* *The project applicant shall pay the applicable CIP fee, which includes the construction of auxiliary lanes on US 50 from Sunrise Boulevard to East Bidwell Street/Scott Road.*

This impact would remain ***significant and unavoidable***. This conclusion reflects the reality that successful implementation of the recommended improvements to the US 50/Scott Road/East Bidwell Street interchange is the responsibility of Caltrans, over which the City of Folsom has no control. For this reason, the City of Folsom is conservatively acknowledging the possibility that, despite its own commitment to work with Caltrans, mutually acceptable accommodation may not be reached. Consistent with CEQA Guidelines section 15091, subdivision (a)(2), though, the City of Folsom concludes that Caltrans can and should implement the mitigation.

**Impact 3: The proposed project could cause potentially significant impacts to the transit system.**

The project would not disrupt existing or planned transit services or facilities, or create inconsistencies with any adopted plans, guidelines, policies or standards related to transit. Therefore, this impact is considered ***less-than-significant***.

Mitigation Measure(s)

*No Impact.*

**Impact 4: The proposed project could cause potentially significant impacts to bicycle and pedestrian facilities.**

The project will construct curb, gutter, and sidewalk on all project roadways to facilitate any potential pedestrian demand. The curb, gutter, and sidewalk will be designed and constructed to meet City standards.

The project would not disrupt existing or planned bicycle/pedestrian facilities or create inconsistencies with any adopted plans, guidelines, policies or standards related to bicycle or pedestrian systems. Therefore, this impact is considered ***less-than-significant***.

Mitigation Measure(s)

*No Impact.*

**Impact 5: The proposed project could cause potentially significant impacts due to construction related activities.**

Construction may include disruptions to the transportation network near the site, including the possibility of temporary lane closures, street closures, sidewalk closures, and bikeway closures; however, access to all nearby parcels will be maintained. Pedestrian and bicycle access in the vicinity of the project site may be disrupted. Heavy vehicles will access the site and may need to be staged for construction. These activities could result in degraded roadway operating conditions. Therefore, the impacts are considered ***significant***.

Mitigation Measure(s)

*Mitigation 5 Prior to the beginning of construction, the applicant shall prepare a construction traffic and parking management plan to the satisfaction of the City Traffic Engineer and subject to review by affected agencies. The plan shall ensure that acceptable operating conditions on local roadways and freeway facilities are maintained. At a minimum, the plan shall include:*

- *Description of trucks including: number and size of trucks per day, expected arrival/departure times, truck circulation patterns.*
- *Description of staging area including: location, maximum number of trucks simultaneously permitted in staging area, use of traffic control personnel, specific signage.*
- *Description of street closures and/or bicycle and pedestrian facility closures including: duration, advance warning and posted signage, safe and efficient access routes for existing businesses and emergency vehicles, and use of manual traffic control.*
- *Description of driveway access plan including: provisions for safe vehicular, pedestrian, and bicycle travel, minimum distance from any open trench, special signage, and private vehicle accesses.*

Implementation of this mitigation would reduce this impact to ***less-than-significant***.

# CUMULATIVE CONDITIONS

This section describes anticipated cumulative (2035) operating conditions in the study area for the roadway system.

## TRAFFIC FORECASTS

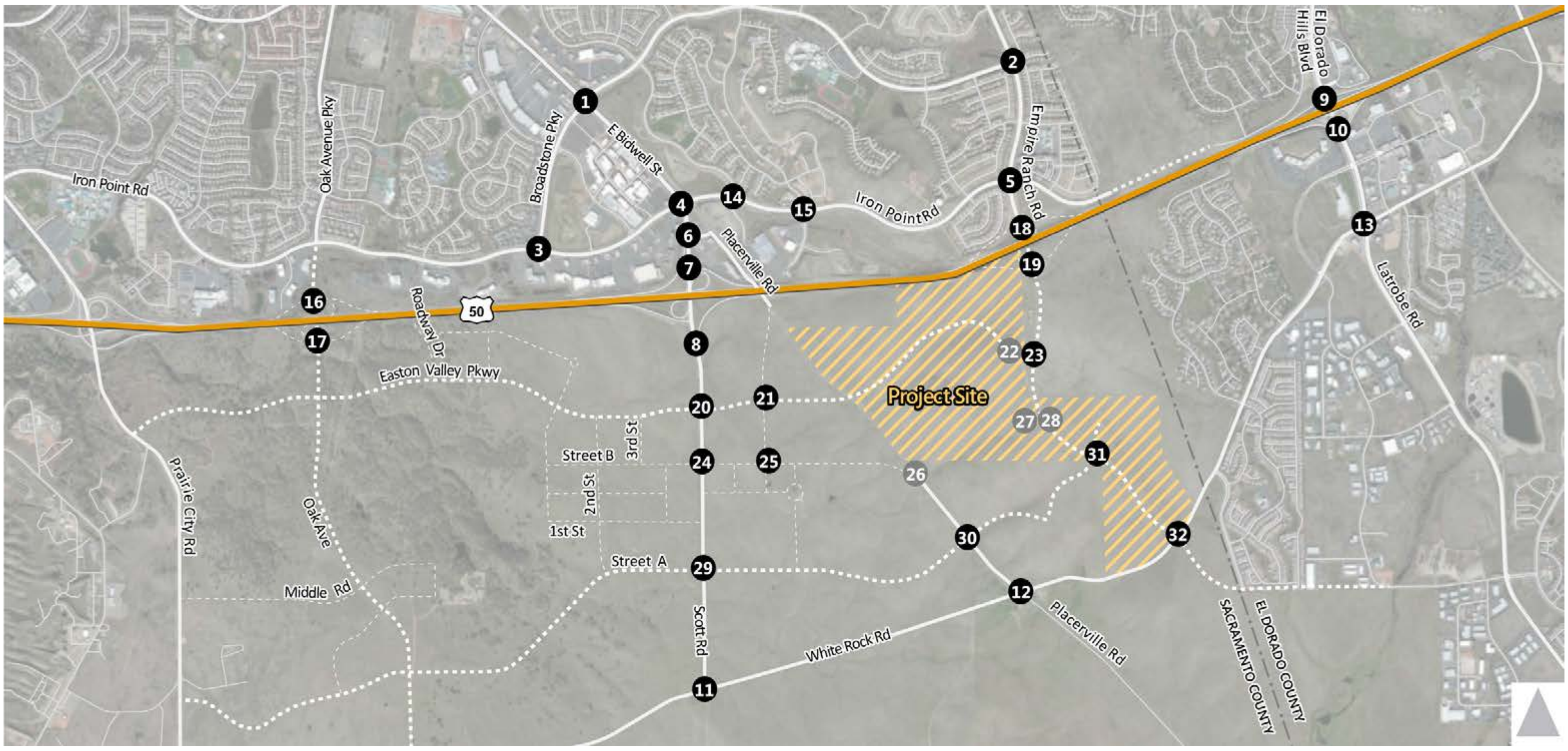
A modified version of the Sacramento Area Council of Governments (SACOG) SACMET regional travel demand model (TDM) was used to forecast cumulative (year 2035) traffic volumes within the study area. The 2035 horizon year is the current horizon year associated with the SACOG MTP. The model was modified to include more detail including the addition of local roadways and disaggregation of land uses into smaller traffic analysis zones (TAZ). This detail provides a more accurate estimation of travel patterns within the study area.

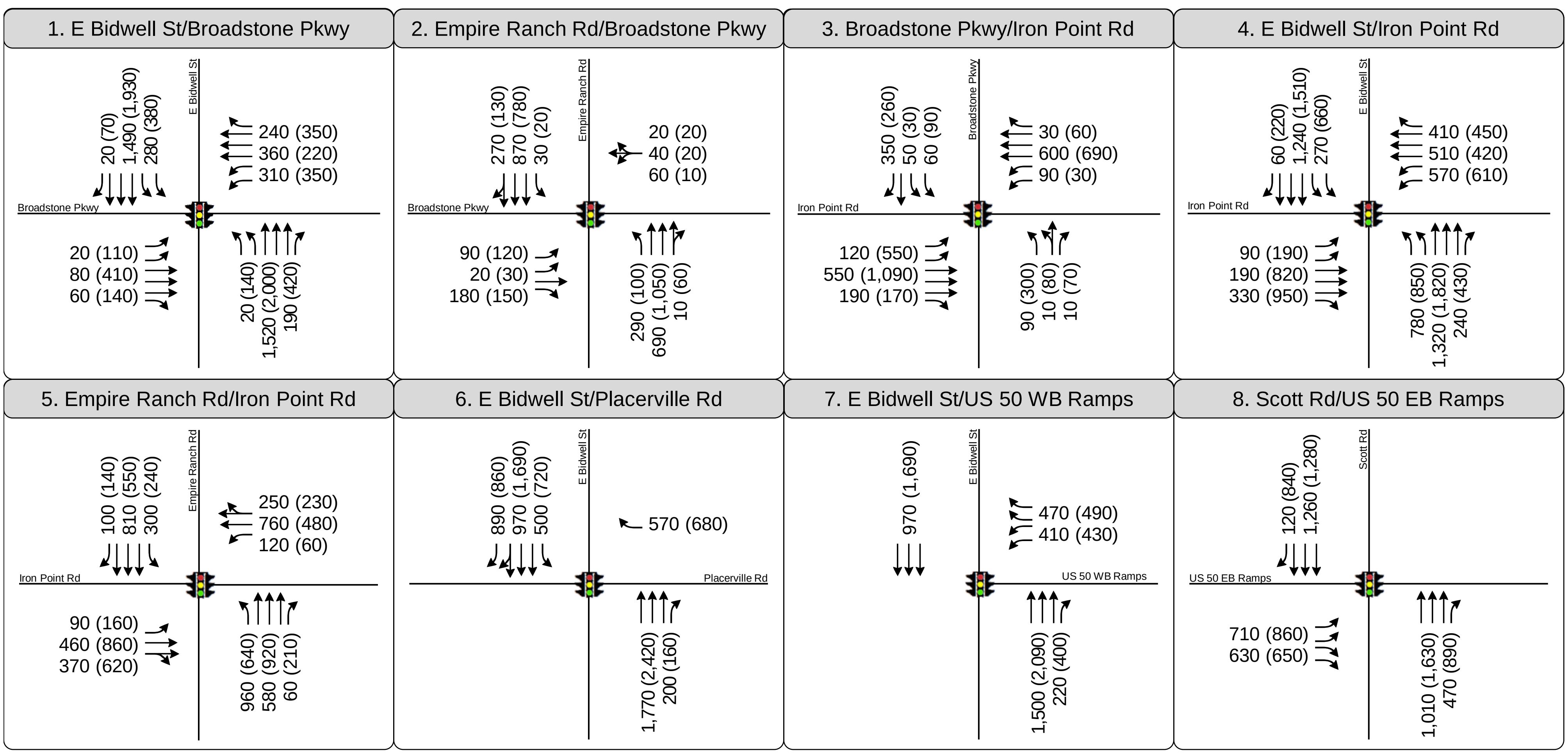
The version of the model used incorporates the current MTP and SCS, and includes planned land use development and transportation infrastructure projects within City of Folsom as well as the surrounding six-county region. The cumulative year forecasts account for full build-out of the Folsom Plan Area Specific Plan (FPASP), which includes the proposed project. The entire Folsom Plan Area is a 3,513 acre comprehensively planned community comprised of approximately 41% residential uses, 15% commercial/office uses, 9% public/quasi-public uses, 30% open space, and 5% major circulation. The Folsom Plan Area is permitted to have up to 10,210 residential units. The FSASP includes a network of four-to-six lane arterial roadways that will serve as "backbone" transportation facilities, including the portions of Empire Ranch Road and Easton Valley Parkway located within Russell Ranch.

The cumulative conditions analyses include all internal roadway improvements associated with the Folsom Plan Area Specific Plan in addition to the following key projects that affect travel patterns within the study area:

- US 50/Empire Ranch Road Interchange – a new interchange on US 50 east of East Bidwell Street/Scott Road. This will cause a significant shift in traffic volumes from East Bidwell Street interchange to the Empire Ranch Road interchange (identified in the MTP as complete by year 2035).
- US 50/Oak Avenue Interchange – a new interchange on US 50 west of East Bidwell Street/Scott Road. This will cause a significant shift in traffic volumes from East Bidwell Street interchange to the Oak Avenue interchange (identified in the MTP as complete by year 2035).

Figures 6A-6D display the resulting Cumulative No Project forecasts, which include build-out of Russell Ranch consistent with the land uses and transportation infrastructure assumptions contained in the FPASP and its accompanying joint Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) approved/certified by the City of Folsom in June 2011. The map included on Figures 6A-6D indicates the alignment of major planned roadways throughout the Plan Area (shown as dashed lines).

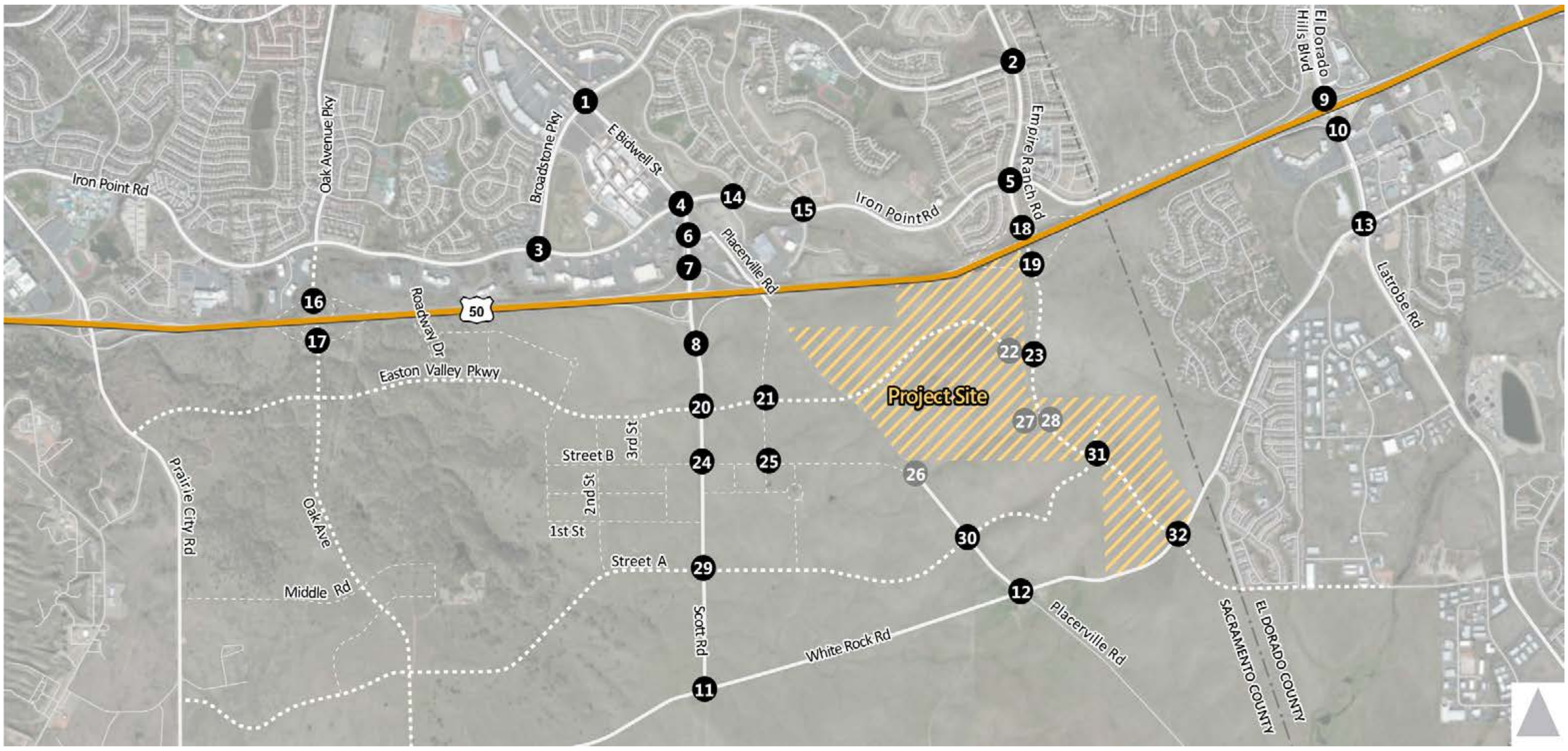


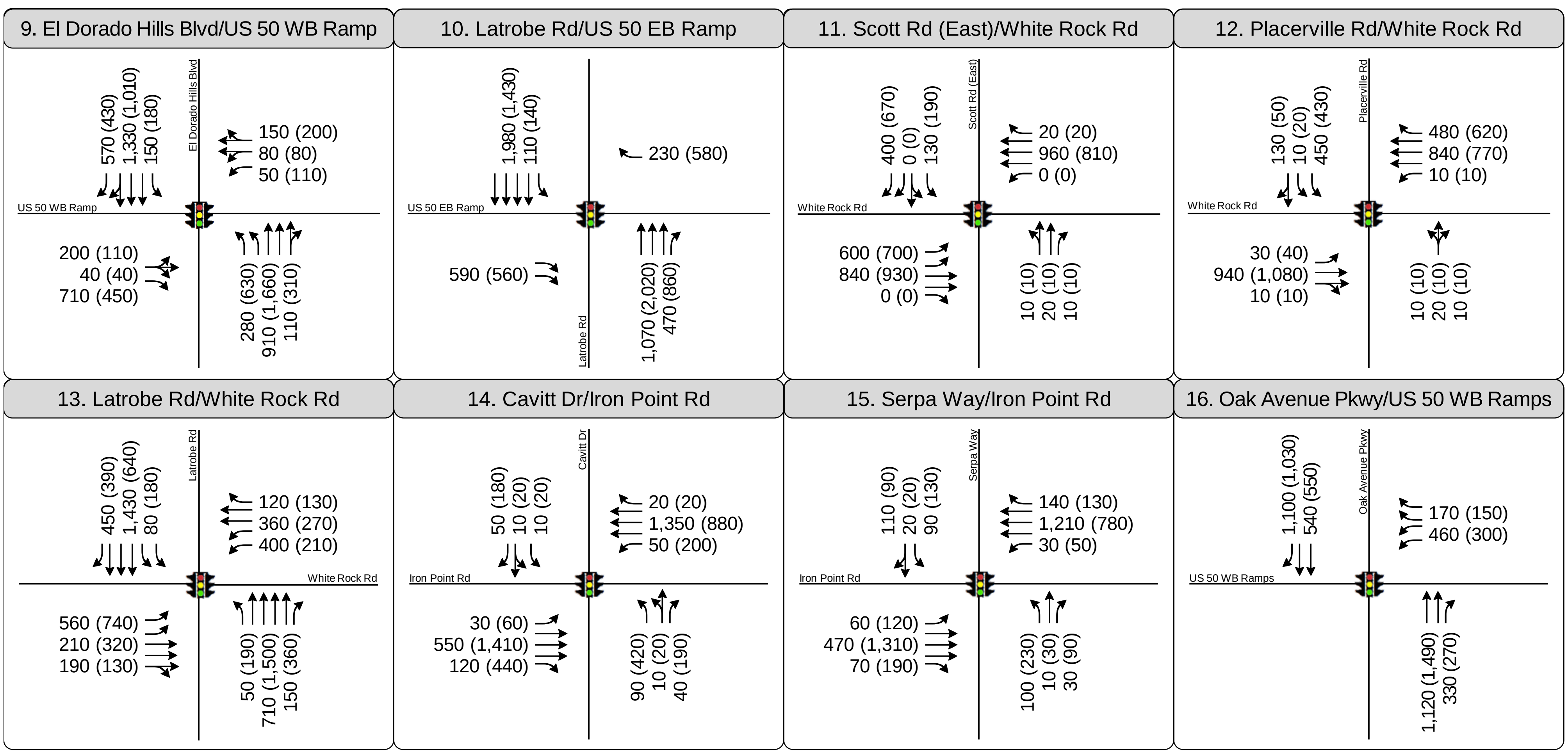




1 Study Intersections
Traffic Signal
Stop Sign
Turn Lane
AM (PM) Peak Hour Traffic Volume

Figure 6A

## Peak Hour Traffic Volumes and Lane Configurations - Cumulative No Project

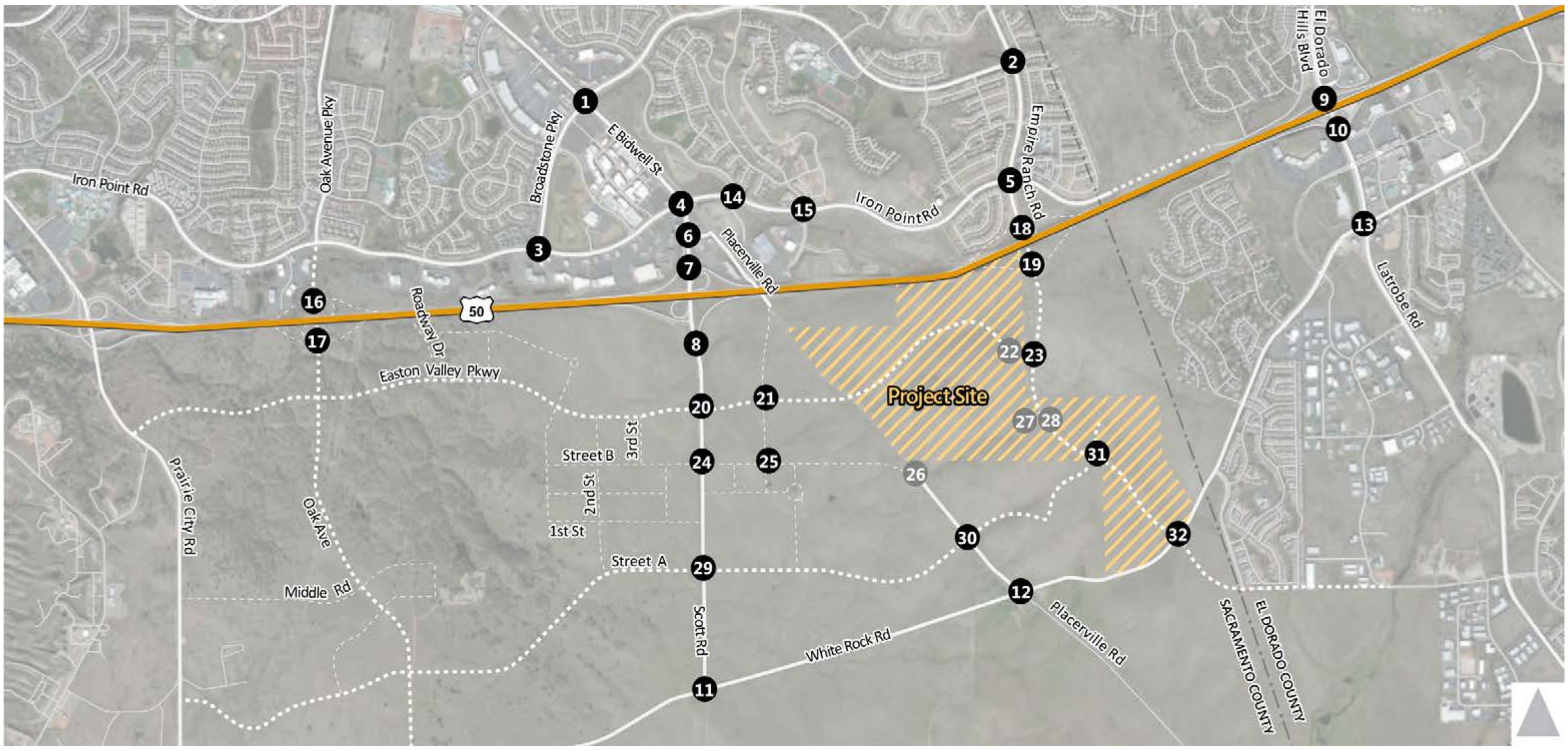


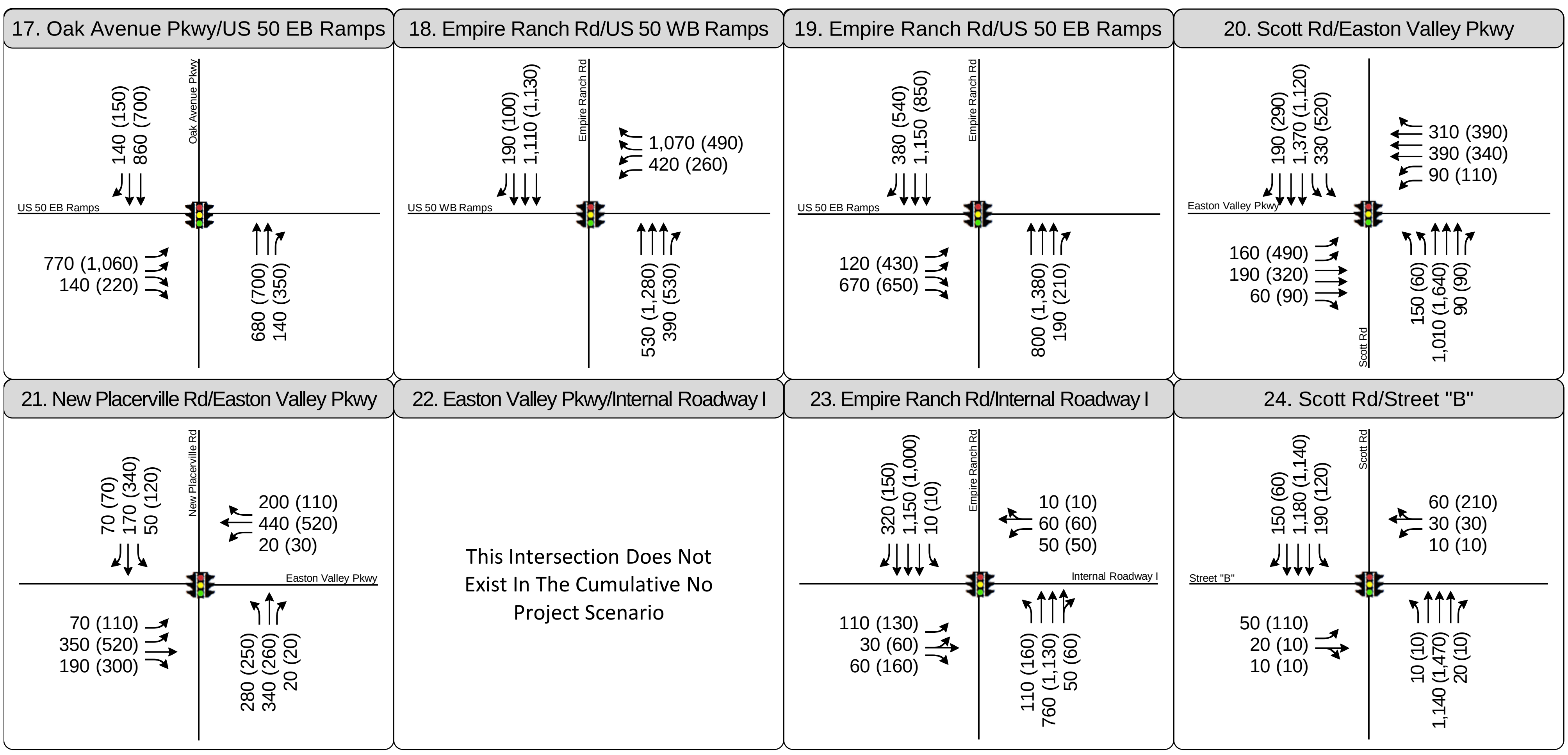




1 Study Intersections
Traffic Signal
Stop Sign
Turn Lane
AM (PM) Peak Hour Traffic Volume

Figure 6B

Peak Hour Traffic Volumes and Lane Configurations - Cumulative No Project

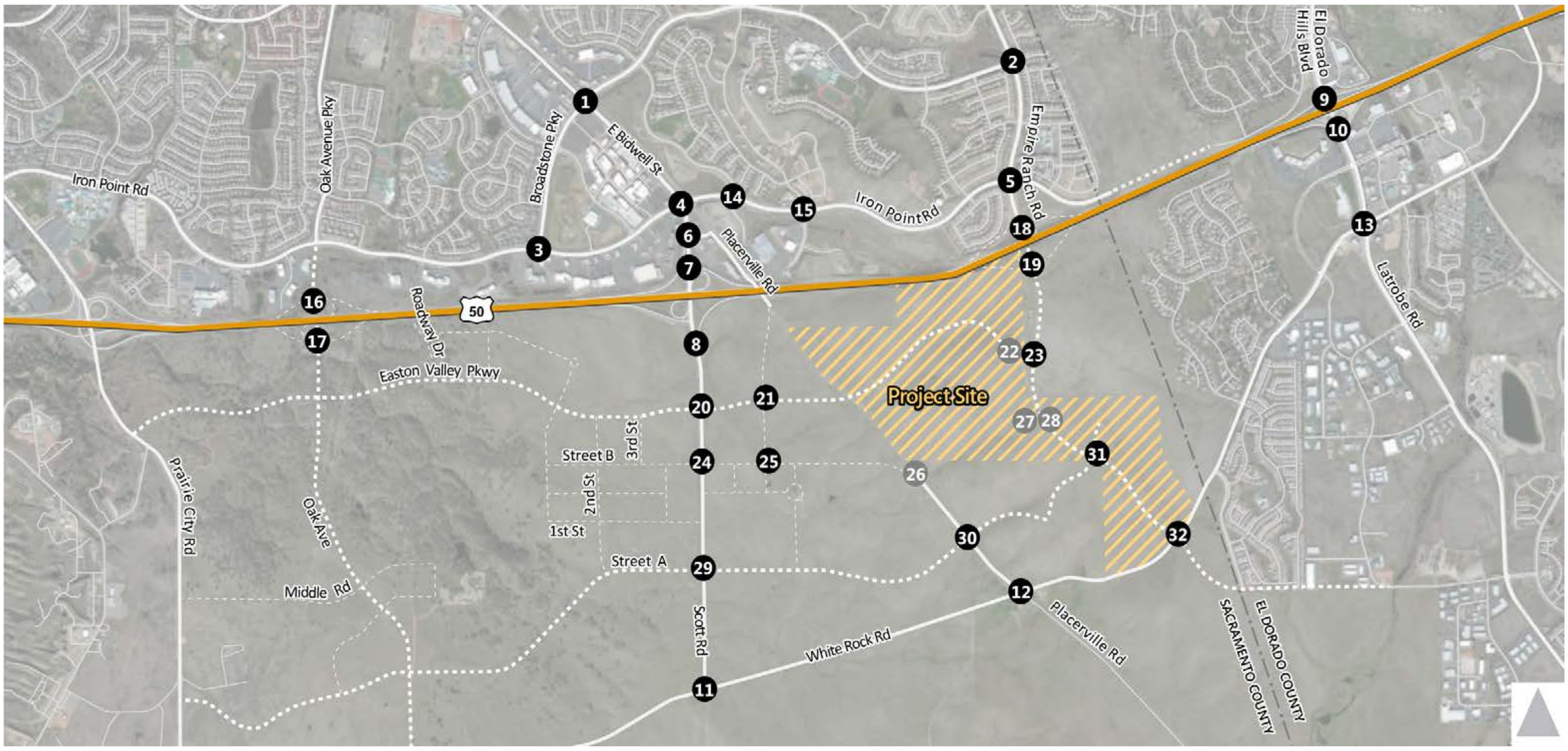


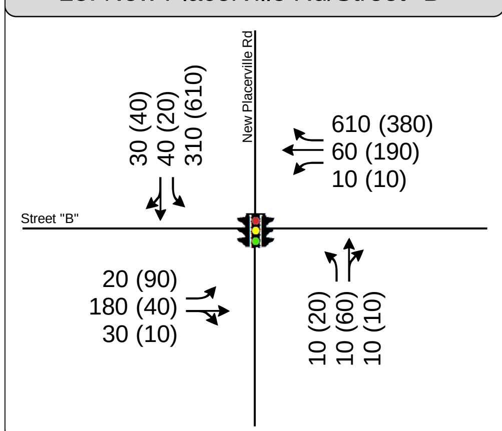

1 Study Intersections
Traffic Signal
Stop Sign
Turn Lane
AM (PM) Peak Hour Traffic Volume

Figure 6C

# Peak Hour Traffic Volumes and Lane Configurations - Cumulative No Project




25. New Placerville Rd/Street "B"




26. Street "B"/Easton Valley Pkwy

This Intersection Does Not Exist In The Cumulative No Project Scenario

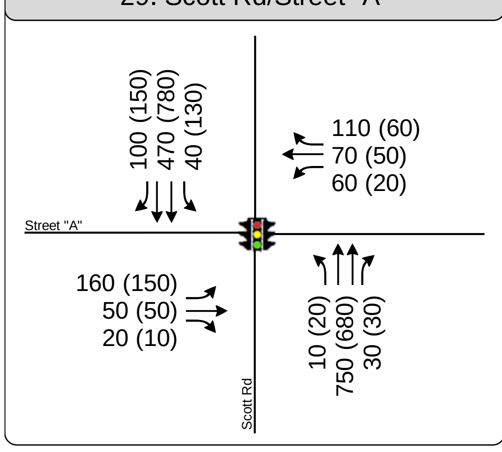
27. Internal Roadway II/Easton Valley Pkwy

This Intersection Does Not Exist In The Cumulative No Project Scenario

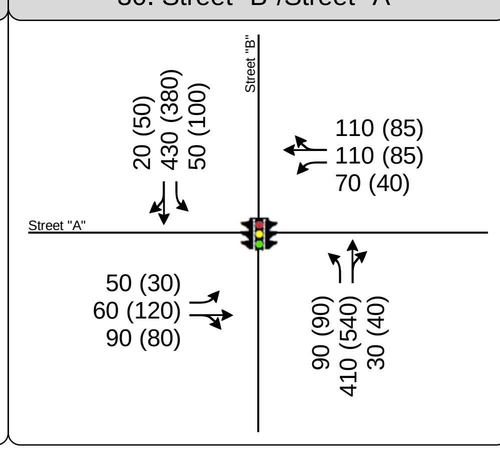
28. Internal Roadway II/Empire Ranch Rd

This Intersection Does Not Exist In The Cumulative No Project Scenario

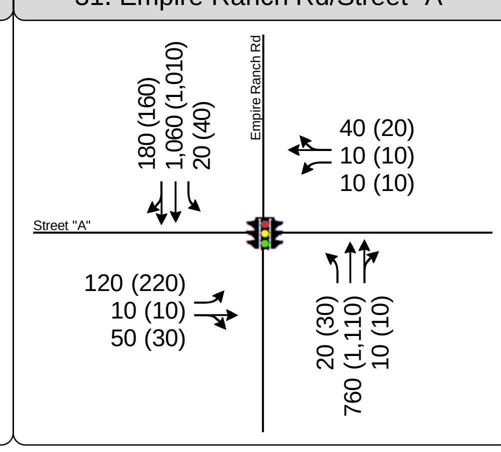
29. Scott Rd/Street "A"



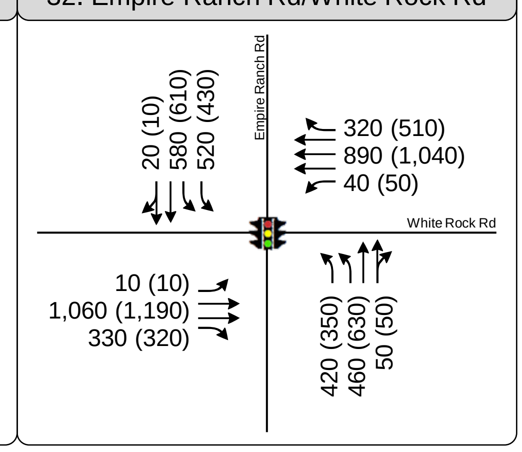

30. Street "B"/Street "A"




31. Empire Ranch Rd/Street "A"




32. Empire Ranch Rd/White Rock Rd




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

Figure 6D

Peak Hour Traffic Volumes and Lane Configurations - Cumulative No Project

## CUMULATIVE INTERSECTION OPERATIONS

Cumulative conditions intersection delay and LOS were calculated for the study intersections using SimTraffic micro-simulation software. Table 9 shows the cumulative conditions delay and LOS results at the study intersections. The technical calculations are provided in Appendix B.

**TABLE 9**
**INTERSECTION LEVEL OF SERVICE – CUMULATIVE NO PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay[1] | LOS | Delay[1] | LOS |
| 1. Broadstone Parkway/East Bidwell Street | Traffic Signal | C | 25 | C | **42** | **D** |
| 2.Empire Ranch Road/Broadstone Parkway | Traffic Signal | C | 16 | B | 11 | B |
| 3. Broadstone Parkway/Iron Point Road | Traffic Signal | C | 13 | B | 24 | C |
| 4. East Bidwell Street/Iron Point Road | Traffic Signal | C | **52** | **D** | **176** | **F** |
| 5. Empire Ranch Road/Iron Point Road | Traffic Signal | C | **119** | **F** | **86** | **F** |
| 6. East Bidwell Street/Placerville Road | Traffic Signal | C | 21* | C* | **43*** | **D*** |
| 7. Scott Road/US 50 Westbound Ramps | Traffic Signal | E | 7 | A | 11 | B |
| 8. Scott Road/US 50 Eastbound Ramps | Traffic Signal | E | 10 | A | 11 | B |
| 9. El Dorado Hills Blvd/US 50 Westbound Ramp | Traffic Signal | E | 53 | D | 34 | C |
| 10. Latrobe Road/US 50 Eastbound Ramp | Traffic Signal | E | 13* | B* | 8* | A* |
| 11. White Rock Road/Scott Road | Traffic Signal | C | 16 | B | 17 | B |
| 12. White Rock Road/Placerville Road | Traffic Signal | C | 15 | B | 16 | B |
| 13. Latrobe Road/White Rock Road | Traffic Signal | E | 41 | D | 55 | D |
| 14. Cavitt Drive/Iron Point Road | Traffic Signal | C | 10 | B | 23 | C |
| 15. Serpa Way/Iron Point Road | Traffic Signal | C | 15 | B | 19 | B |
| 16. Oak Avenue Pkwy/US 50 Westbound Ramps | Traffic Signal | E | 8 | A | 7 | A |
| 17. Oak Avenue Pkwy/US 50 Eastbound Ramps | Traffic Signal | E | 9 | A | 10 | B |

**TABLE 9**
**INTERSECTION LEVEL OF SERVICE – CUMULATIVE NO PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS[1] | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay[1] | LOS | Delay[1] | LOS |
| 18. Empire Ranch Road/US 50 Westbound Ramps | Traffic Signal | E | 12 | B | 7 | A |
| 19. Empire Ranch Road/US 50 Eastbound Ramps | Traffic Signal | E | 7 | A | 11 | B |
| 20. Scott Road/Easton Valley Pkwy | Traffic Signal | C | 24 | C | 51 | D |
| 21. Easton Valley Pkwy/Placerville Road | Traffic Signal | C | 24 | C | 37 | D |
| 22. Easton Valley Pkwy/Internal Roadway | Roundabout | C | NA | NA | NA | NA |
| 23. Internal Roadway/Empire Ranch Road | Traffic Signal | C | 14 | B | 15 | B |
| 24. Street "B"/Scott Road | Traffic Signal | C | 12 | B | 18 | B |
| 25. East Road/Street "B" | Traffic Signal | C | 15 | B | 25 | C |
| 26. Street "B"/Easton Valley Parkway | Side-Street Stop Control | C | NA | NA | NA | NA |
| 27. Internal Roadway II/Easton Valley Pkwy | Roundabout | C | NA | NA | NA | NA |
| 28. Internal Roadway II/Empire Ranch Road | Traffic Signal | C | NA | NA | NA | NA |
| 29. Scott Road/Street "A" | Traffic Signal | C | 15 | B | 16 | B |
| 30. Street "A"/Street "B" | Traffic Signal | C | 18 | B | 20 | C |
| 31. Street "A"/Empire Ranch Road | Traffic Signal | C | 14 | B | 18 | B |
| 32. White Rock Road/Empire Ranch Road | Traffic Signal | C | 32 | C | 37 | D |

Note:
1. For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For side-street stop controlled intersections, the delay is reported in seconds per vehicle for the worst individual movement. All results are rounded to the nearest second.
* HCM 2000 used to analyze this intersection because HCM 2010 methodology only supports strict National Electrical Manufacturers Association (NEMA) phasing.

**Bold** indicates unacceptable operations.
*Source: Fehr & Peers, 2014*

As shown in Table 9, the Iron Point Road/East Bidwell Street and the Empire Ranch/Iron Point Road intersections will operate with unacceptable levels of service during the AM peak hour under cumulative conditions without implementation of the proposed project. During the PM peak hour, the Broadstone Parkway/East Bidwell Street, East Bidwell Street/Iron Point Road, East Bidwell Street/Placerville Road, Scott Road/Easton Valley Parkway, Easton Valley Parkway/Placerville Road, and the White Rock Road/Empire Ranch Road intersections will operate at unacceptable levels of service under cumulative no project conditions.

## CUMULATIVE FREEWAY OPERATIONS

Cumulative conditions freeway facility LOS was determined using HCM 2010 methodology. Table 10 shows the cumulative conditions LOS results for the study freeway facilities. The technical calculations are provided in Appendix D.

**TABLE 10**
**FREEWAY LEVEL OF SERVICE – CUMULATIVE NO PROJECT CONDITIONS**

| Direction | Location | Facility Type | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| Eastbound | US 50, Folsom Blvd. to Prairie City Rd. | Weave | 0.75** | 27.9** | D** | 0.79** | 30.1** | D** |
| | US 50 between Prairie City Rd. Ramps | Basic | 1.01 | - | F | 1.01 | - | F |
| | Prairie City Rd. On-Ramp | Merge | 1.04 | - | F | 1.09 | - | F |
| | US 50, Prairie City Rd. to Oak Ave. | Weave | NA* | NA* | D* | NA* | NA* | F* |
| | US 50 between Oak Ave. Ramps | Basic | 0.88 | 35.2 | E | 0.94 | 39.8 | E |
| | Oak Ave. Loop On-Ramp | Merge | 0.93 | 36.9 | E | 1.00 | 39.3 | E |
| | US 50, Oak Ave. to Scott Rd. | Weave | 0.63** | 22.6 ** | C** | NA* | NA* | D* |
| | US 50 between Scott Rd. Ramps | Basic | 0.69 | 25.1 | C | 0.74 | 27.6 | D |
| | Scott Rd. Loop On-Ramp | Merge | 0.48 | 17.2 | B | 0.62 | 22.4 | C |
| | US 50, Scott Rd. to Empire Ranch Rd | Weave | NA* | NA* | B* | NA* | NA* | D* |
| | US 50 between Empire Ranch Rd. Ramps | Basic | 0.45 | 16.3 | B | 0.57 | 20.7 | C |
| | Empire Ranch Rd. Loop On-Ramp | Merge | 0.50 | 21.2 | C | 0.64 | 26.3 | C |
| | US 50, Empire Ranch Rd. to Latrobe Rd. | Weave | 0.40** | 14.5** | B** | 0.50** | 18.1** | C** |
| | Latrobe Rd. Off-Ramp II | Diverge | 0.50 | 21.8 | C | 0.65 | 27.5 | C |
| | US 50 between Latrobe Rd. Ramps | Basic | 0.42 | 15.0 | B | 0.53 | 19.0 | C |
| | US 50, Latrobe Rd. to White Rock | Weave | 0.38** | 13.7** | B** | NA* | NA* | B* |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Westbound | US 50, Silva Valley Rd. to El Dorado Hills Blvd. | Weave | NA* | NA* | B* | 0.34** | 11.6** | B** |
| | US 50 between El Dorado Hills Blvd. Ramps | Basic | 0.56 | 19.3 | C | 0.39 | 13.5 | B |
| | US 50, El Dorado Hills Blvd. to Empire Ranch Rd. | Weave | NA* | NA* | C* | NA* | NA* | B* |
| | US 50 between Empire Ranch Rd. Ramps | Basic | 0.50 | 17.3 | B | 0.46 | 15.7 | B |
| | Empire Ranch Rd. Loop On-Ramp | Merge | 0.54 | 22.9 | C | 0.54 | 22.5 | C |
| | US 50, Empire Ranch Rd. to E. Bidwell Rd. | Weave | 0.43** | 14.6** | B** | 0.38** | 13.0** | B** |
| | US 50 between E. Bidwell Rd. Ramps | Basic | 0.65 | 22.8 | C | 0.58 | 20.2 | C |
| | E. Bidwell Rd. Loop On-Ramp | Merge | 0.73 | 29.7 | D | 0.70 | 28.6 | D |
| | US 50, E. Bidwell Rd. to Oak Ave. | Weave | 0.59** | 20.5** | C | 0.56** | 19.1** | C** |
| | US 50 between Oak Ave. Ramps | Basic | 0.74 | 26.7 | D | 0.73 | 26.6 | D |
| | Oak Ave. Loop On-Ramp | Merge | 0.85 | 33.8 | D | 0.83 | 33.2 | D |
| | US 50, Oak Ave. to Prairie City Rd. | Weave | NA* | NA* | E* | NA* | NA* | D* |
| | US 50 between Prairie City Rd. Ramps | Basic | 0.85 | 33.2 | D | 0.87 | 34.4 | D |
| | Prairie City Rd. Loop On-Ramp | Merge | 0.93 | 36.8 | E | 0.92 | 36.6 | E |
| | Prairie City Rd. to Folsom Blvd. | Weave | 0.63** | 21.8** | C** | 0.66** | 23.0** | C** |

Notes: Merge, Diverge, and Basic Segments were analyzed using HCM 2010 methodology. Weave segments were analyzed with the Leisch Method. Weave segments that fell outside of the realm of weaving were analyzed using the HCM 2010 methodology.
1. v/c ratio = volume-to-capacity ratio
2. pcplpm = passenger cars per lane per mile
* Segment analyzed using Leisch Method (v/c ratio and pcplpm not provided).
**Segment fell outside of the realm of weaving and was analyzed using HCM 2010 methodology.
**Bold** indicates unacceptable operations.
*Source: Fehr & Peers, 2014.*

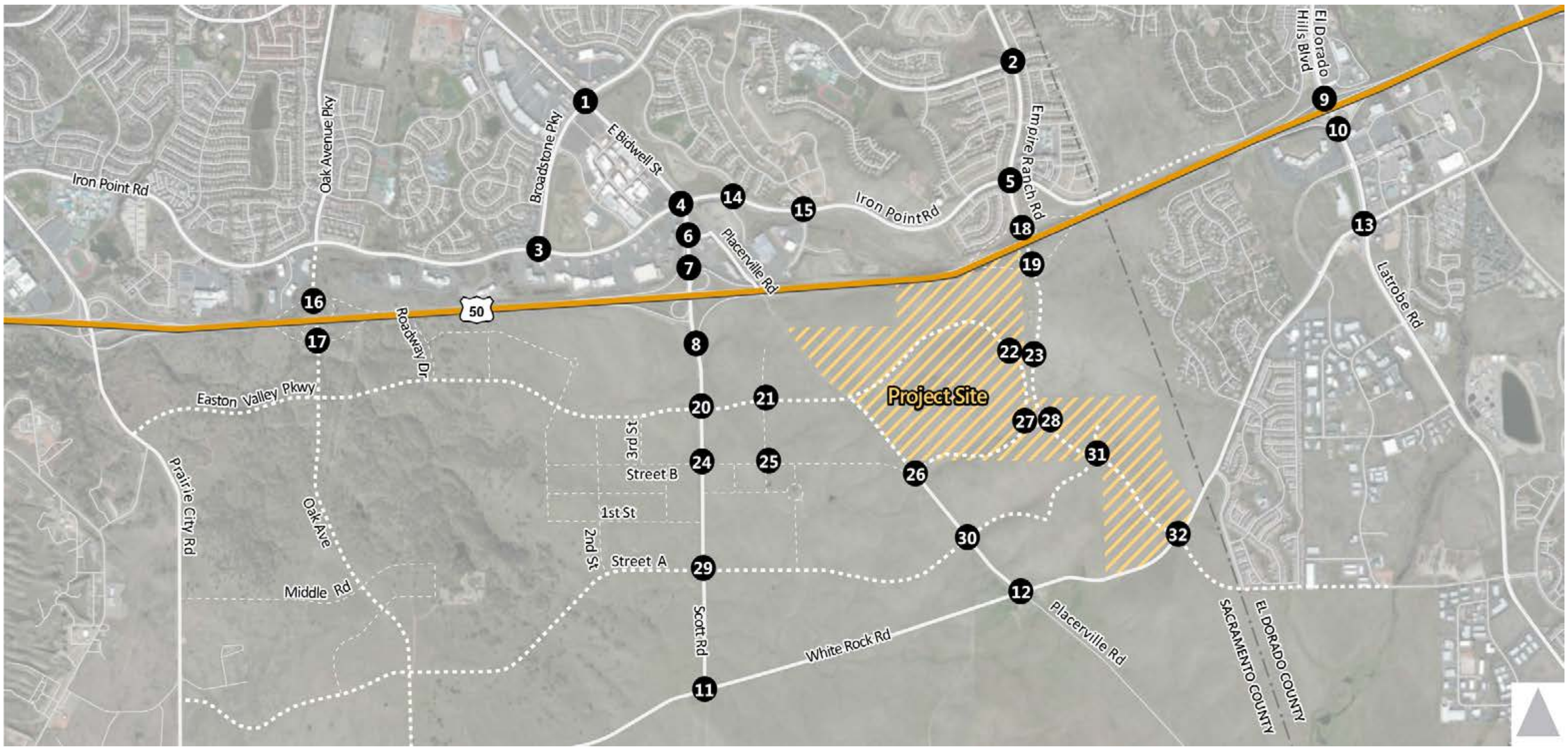
As shown in Table 10, the eastbound segment of US 50 between the Prairie City Road Ramps and the eastbound Prairie City Road On-Ramp are expected to operate at LOS F during the AM peak hour. During the PM peak hour, the eastbound segment of US 50 between the Prairie City Road Ramps, the eastbound Prairie City Road On-Ramp, and the segment of US 50 between Prairie City Road and Oak Avenue are expected to operate at LOS F.

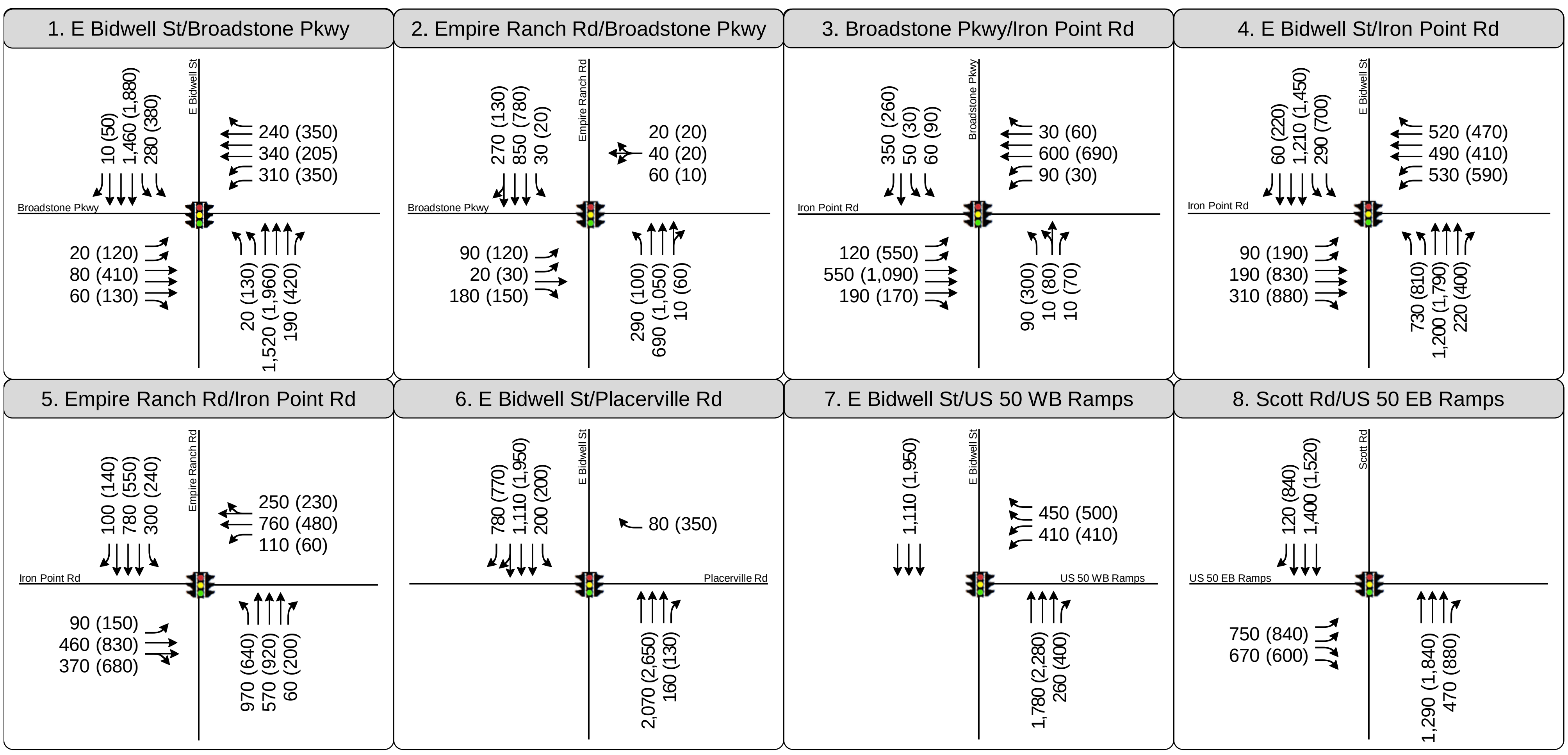
# CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative impacts of the proposed project on the transportation system are identified in this section. The cumulative plus project scenario includes build-out of the proposed project consistent with the land uses and infrastructure assumptions contained in the current development permit application submitted to the City of Folsom. The project as currently proposed contains substantially lower levels of land use than the approved FPASP, therefore the cumulative plus project forecasts, are generally lower than the cumulative no project forecasts. The cumulative plus project forecasts, shown in Figures 7A-7D, also include the following additional transportation infrastructure project identified by the City of Folsom that would be implemented prior to year 2035:

- Placerville Road Closure at US 50 – Placerville Road will be closed to through motor vehicle traffic at the US 50 undercrossing.

Each cumulative impact is followed by recommended mitigation measures to reduce the significance of identified impacts.




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

Figure 7A

# Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project

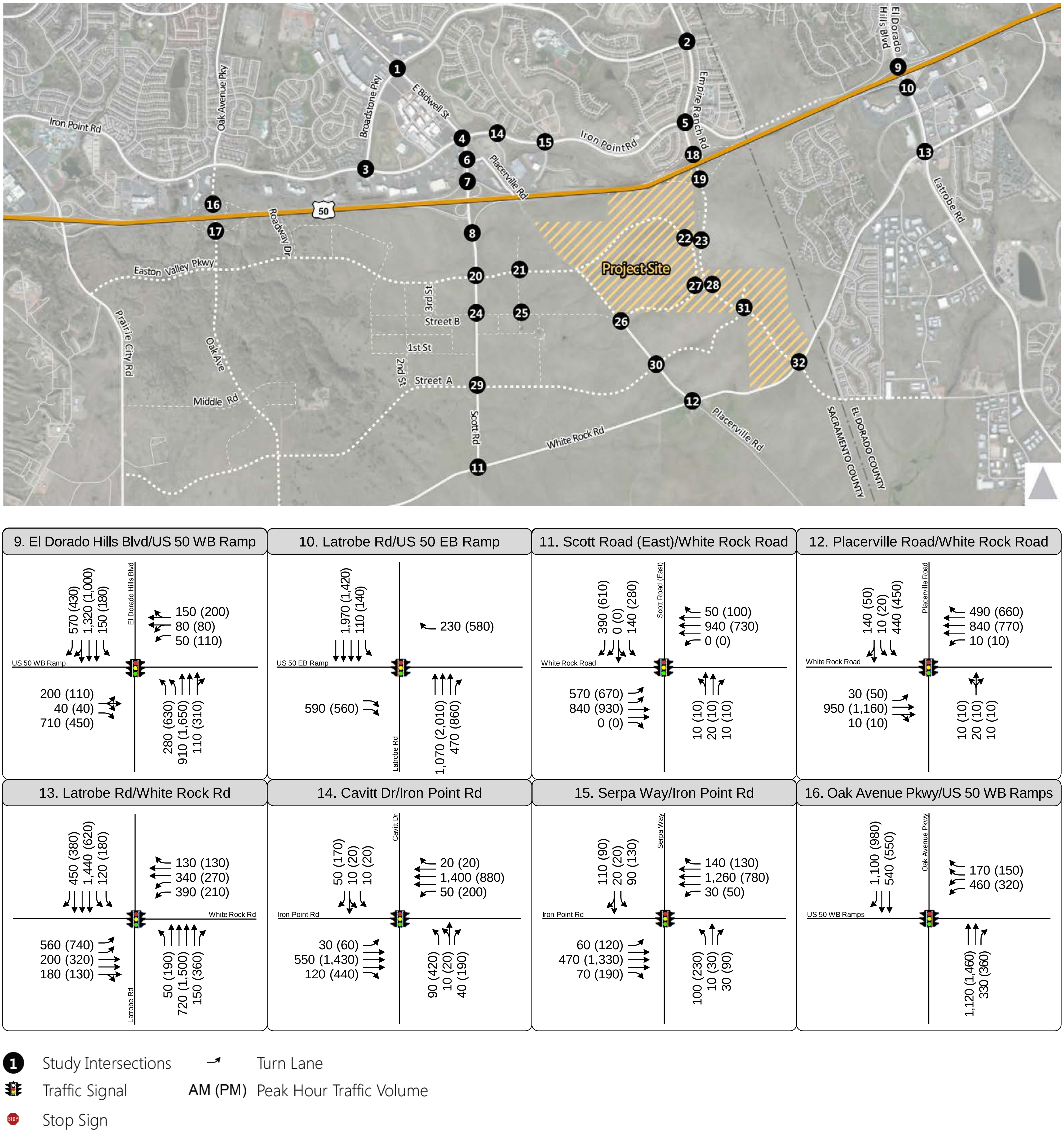
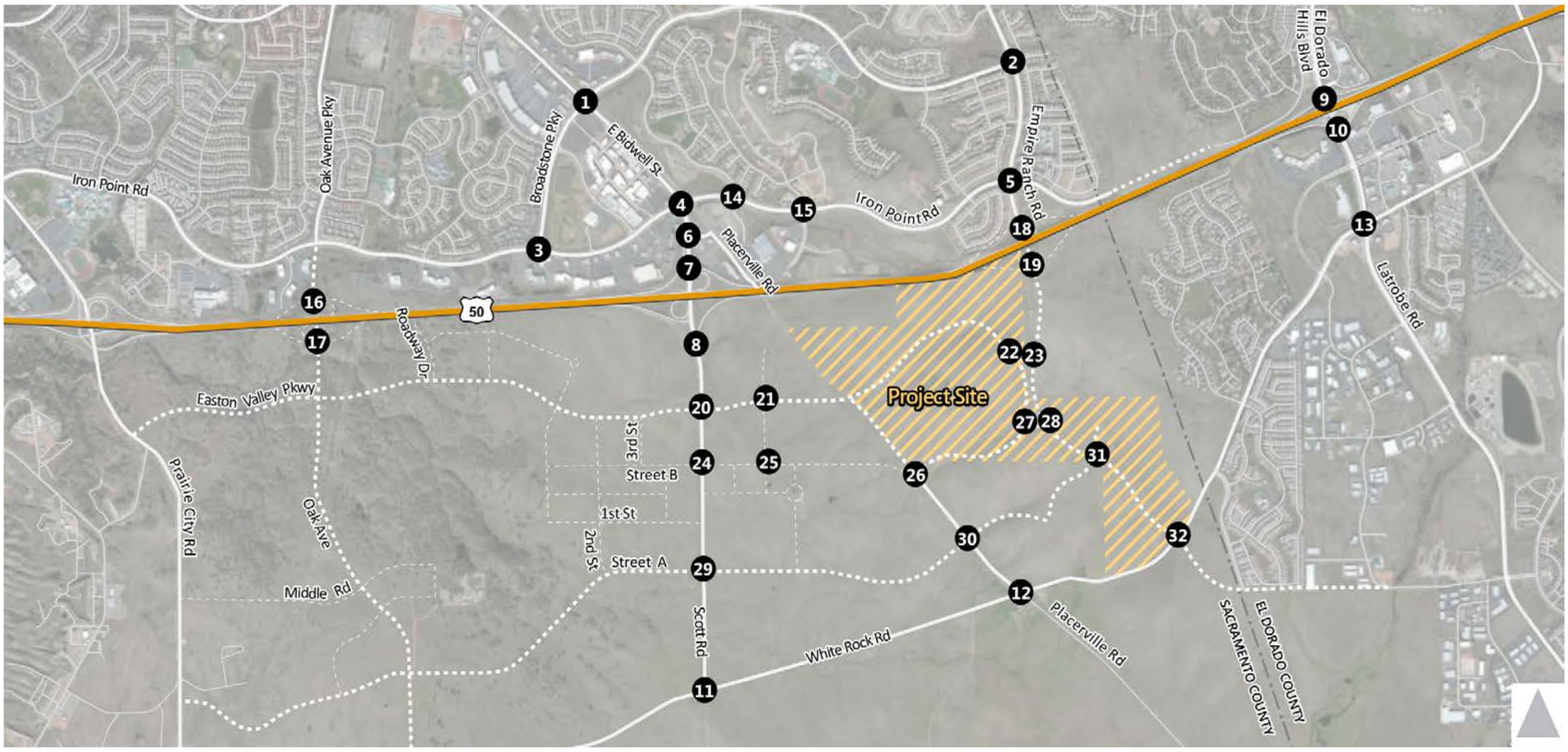
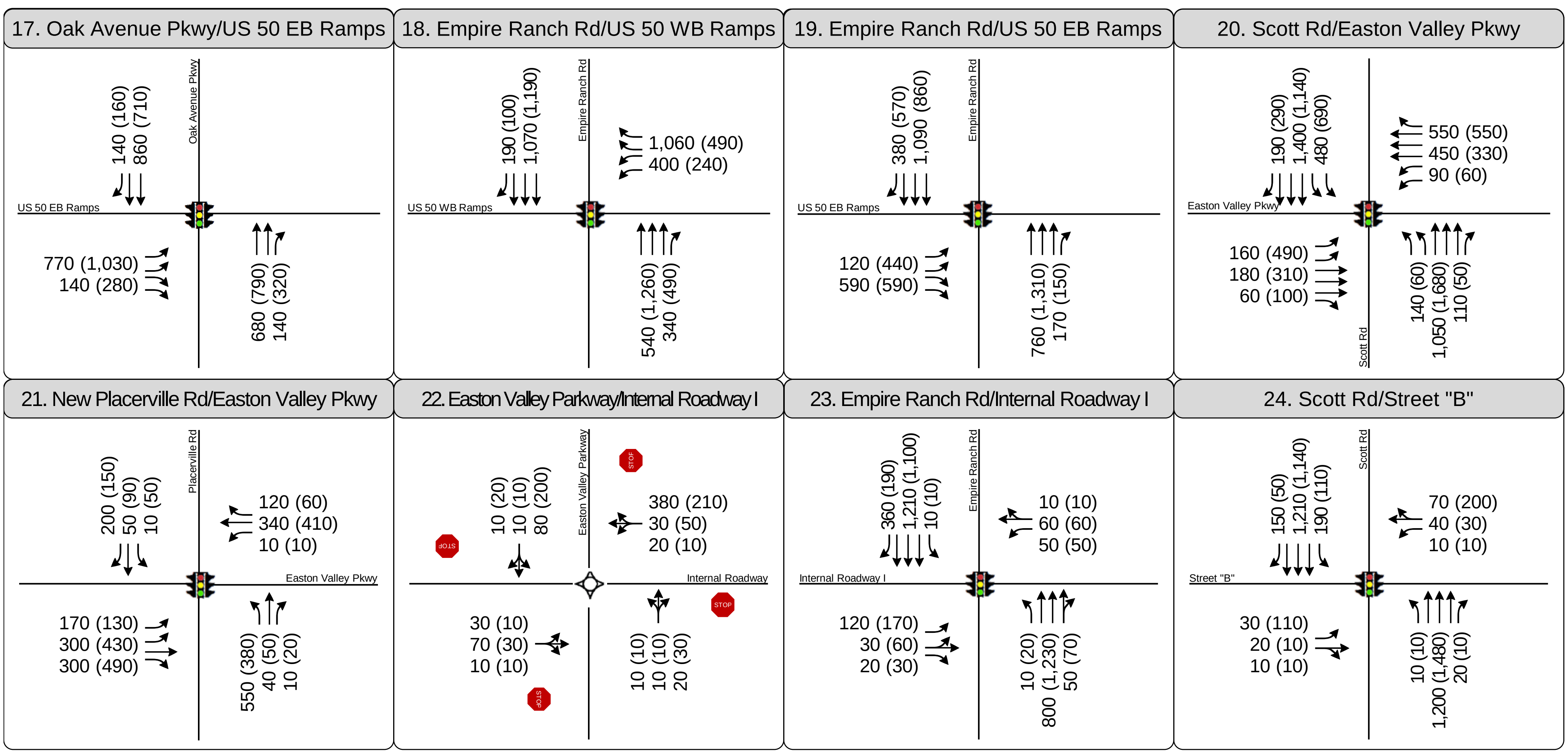



Figure 7B

# Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project




Study Intersection

Traffic Signal

Stop Sign

Roundabout

Turn Lane

AM (PM) Peak Hour Traffic Volume

Figure 7C

# Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project

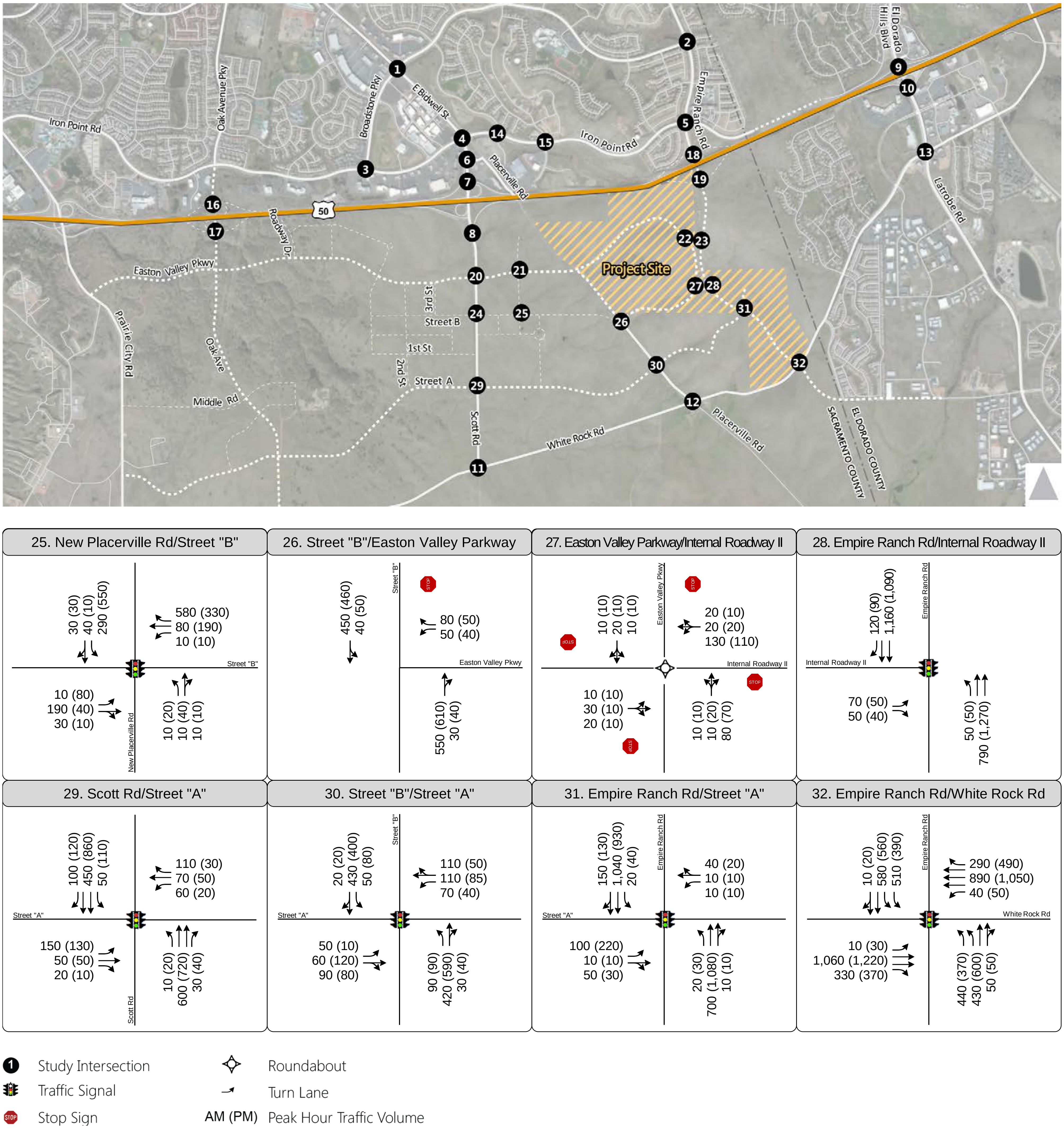



Figure 7D

Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project

**Impact 6: The proposed project could cause potentially significant cumulative impacts to study intersections under cumulative plus project conditions.**

The proposed project would result in changes to traffic levels and travel patterns under cumulative conditions. Table 11 summarizes the existing plus project LOS results at the study intersections (refer to Appendix B for detailed technical calculations).

**TABLE 11**
**INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS | Cumulative No Project | | | | Cumulative Plus Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| 1. Broadstone Parkway/ East Bidwell Street | Traffic Signal | C | 25 | C | **42** | **D** | 23 | C | **41** | **D** |
| 2.Empire Ranch Road/ Broadstone Parkway | Traffic Signal | C | 16 | B | 11 | B | 16 | B | 11 | B |
| 3. Broadstone Parkway/ Iron Point Road | Traffic Signal | C | 13 | B | 24 | C | 13 | B | 24 | C |
| 4. East Bidwell Street/ Iron Point Road | Traffic Signal | C | **52** | **D** | **176** | **F** | **49** | **D** | **141** | **F** |
| 5. Empire Ranch Road/ Iron Point Road | Traffic Signal | C | **119** | **F** | **86** | **F** | **122** | **F** | **89** | **F** |
| 6. East Bidwell Street/ Placerville Road | Traffic Signal | C | 21* | C* | **43*** | **D*** | 10* | A* | 16* | B* |
| 7. Scott Road/ US 50 Westbound Ramps | Traffic Signal | E | 7 | A | 11 | B | 10 | A | 8 | A |
| 8. Scott Road/ US 50 Eastbound Ramps | Traffic Signal | E | 10 | A | 11 | B | 15 | B | 11 | B |
| 9. El Dorado Hills Blvd/ US 50 Westbound Ramp | Traffic Signal | E | 53 | D | 34 | C | 39 | D | 34 | C |
| 10. Latrobe Road/ US 50 Eastbound Ramp | Traffic Signal | E | 13* | B* | 9* | A* | 7* | A* | 8* | A* |
| 11. White Rock Road/ Scott Road | Traffic Signal | C | 16 | B | 17 | B | 15 | B | 17 | B |

**TABLE 11**
**INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS | Cumulative No Project | | | | Cumulative Plus Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| 12. White Rock Road/ Placerville Road | Traffic Signal | C | 15 | B | 16 | B | 15 | B | 16 | B |
| 13. Latrobe Road/ White Rock Road | Traffic Signal | E | 41 | D | 55 | D | 40 | D | 56 | E |
| 14. Cavitt Drive/ Iron Point Road | Traffic Signal | C | 10 | B | 23 | C | 10 | A | 23 | C |
| 15. Serpa Way/ Iron Point Road | Traffic Signal | C | 15 | B | 20 | B | 15 | B | 19 | B |
| 16. Oak Avenue Pkwy/ US 50 Westbound Ramps | Traffic Signal | E | 8 | A | 7 | A | 8 | A | 7 | A |
| 17. Oak Avenue Pkwy/ US 50 Eastbound Ramps | Traffic Signal | E | 9 | A | 10 | B | 9 | A | 10 | B |
| 18. Empire Ranch Road/ US 50 Westbound Ramps | Traffic Signal | E | 12 | B | 7 | A | 12 | B | 9 | A |
| 19. Empire Ranch Road/ US 50 Eastbound Ramps | Traffic Signal | E | 7 | A | 11 | B | 7 | A | 11 | B |
| 20. Scott Road/Easton Valley Pkwy | Traffic Signal | C | 24 | C | 51 | D | 41 | D | **80** | **E** |
| 21. Easton Valley Pkwy/ Placerville Road | Traffic Signal | C | 24 | C | 37 | D | 33 | C | 25 | C |
| 22. Easton Valley Pkwy/ Internal Roadway I | Roundabout | C | NA | NA | NA | NA | 7 | A | 6 | A |
| 23. Internal Roadway I/ Empire Ranch Road | Traffic Signal | C | 13 | B | 15 | B | 11 | B | 13 | B |
| 24. Street "B"/ Scott Road | Traffic Signal | C | 12 | B | 18 | B | 12 | B | 15 | B |

**TABLE 11**
**INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS**

| Intersection | Control | Minimum Acceptable LOS | Cumulative No Project | | | | Cumulative Plus Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS | Delay[1] | LOS |
| 25. East Road/ Street "B" | Traffic Signal | C | 15 | B | 25 | C | 15 | B | 21 | C |
| 26. Street "B"/ Easton Valley Parkway | Side-Street Stop Control | C | NA | NA | NA | NA | 21 | C | 24 | C |
| 27. Internal Roadway II/ Easton Valley Pkwy | Roundabout | C | NA | NA | NA | NA | 5 | A | 4 | A |
| 28. Internal Roadway II/ Empire Ranch Road | Traffic Signal | C | NA | NA | NA | NA | 3 | A | 3 | A |
| 29. Scott Road/ Street "A" | Traffic Signal | C | 14 | B | 16 | B | 14 | B | 14 | B |
| 30. Street "A"/ Street "B" | Traffic Signal | C | 17 | B | 20 | C | 19 | B | 19 | B |
| 31. Street "A"/ Empire Ranch Road | Traffic Signal | C | 18 | B | 18 | B | 13 | B | 16 | B |
| 32. White Rock Road/ Empire Ranch Road | Traffic Signal | C | 32 | C | 37 | D | 31 | C | 35 | C |

Note:
1. For signalized and all-way stop controlled intersections, average intersection delay is reported in seconds per vehicle for the overall intersection. For side-street stop controlled intersections, the delay is reported in seconds per vehicle for the worst individual movement. All results are rounded to the nearest second.
* HCM 2000 used to analyze this intersection because HCM 2010 methodology only supports strict NEMA phasing.

**Bold** indicates unacceptable operations.
**Bold** indicates significant impact.
*Source: Fehr & Peers, 2014*

As shown in Table 11, the Scott Road/Easton Valley Parkway intersection will operate at unacceptable LOS D during the PM peak hour under no project conditions, and the proposed project would add more than five seconds of delay to this intersection. This is the result of the project removing a portion of Placerville Road and rerouting traffic west to Scott Road. The project would contribute to a ***significant*** cumulative impact to the Scott Road/Easton Valley Parkway intersection under cumulative plus project conditions.

Mitigation Measure(s)

During the PM peak hour, the addition of a channelized westbound right-turn lane to the Scott Road/Easton Valley Parkway intersection would reduce delay to acceptable conditions. Mitigation will improve operations to the following LOS:

- PM Peak Hour: Delay – 54 seconds/vehicle, LOS D

*Mitigation 6* *Project applicant will pay a fair share fee towards the following improvements to the Scott Road/Easton Valley Parkway intersection: Provide right of way and add a channelized westbound right-turn lane.*

**Impact 7: The proposed project could cause potentially significant cumulative impacts to study freeway facilities.**

Project trips were assigned to the study facilities in accordance with the trip generation and distribution assumptions described previously. Table 12 shows the cumulative plus project LOS results for the study freeway facilities. The detailed technical calculations are provided in Appendix D.

**TABLE 12**
**FREEWAY LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS**

| Direction | Location | Facility Type | Cumulative No Project | | | | | | Cumulative Plus Project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| Eastbound | US 50, Folsom Blvd. to Prairie City Rd. | Weave | 0.75** | 27.9** | D | 0.79** | 30.1** | D | 0.74** | 27.56** | D | 0.79** | 29.9** | D |
| | US 50 between Prairie City Rd. Ramps | Basic | 1.01 | - | F | 1.01 | - | F | 1.00 | 44.9 | E | 1.00 | - | F |
| | Prairie City Rd. On-Ramp | Merge | 1.04 | - | F | 1.09 | - | F | 1.03 | - | F | 1.09 | - | F |
| | US 50, Prairie City Rd. to Oak Ave. | Weave | NA* | NA* | D | NA* | NA* | F | NA* | NA* | D | NA* | NA* | F |
| | US 50 between Oak Ave. Ramps | Basic | 0.88 | 35.2 | E | 0.94 | 39.8 | E | 0.87 | 34.6 | D | 0.93 | 39.1 | E |
| | Oak Ave. Loop On-Ramp | Merge | 0.93 | 36.9 | E | 1.00 | 39.3 | E | 0.92 | 36.6 | E | 0.99 | 39.1 | E |
| | US 50, Oak Ave. to Scott Rd. | Weave | 0.63** | 22.6 ** | C | NA* | NA* | D | 0.62** | 22.4** | C | NA* | NA* | D |
| | US 50 between Scott Rd. Ramps | Basic | 0.69 | 25.1 | C | 0.74 | 27.6 | D | 0.66 | 24.0 | C | 0.74 | 27.6 | D |
| | Scott Rd. Loop On-Ramp | Merge | 0.48 | 17.2 | B | 0.62 | 22.4 | C | 0.46 | 16.6 | B | 0.62 | 22.4 | C |
| | US 50, Scott Rd. to Empire Ranch Rd | Weave | NA* | NA* | B | NA* | NA* | D | 0.41** | 14.7** | B | NA* | NA* | D |
| | US 50 between Empire Ranch Rd. Ramps | Basic | 0.45 | 16.3 | B | 0.57 | 20.7 | C | 0.44 | 16.0 | B | 0.58 | 20.9 | C |
| | Empire Ranch Rd. Loop On-Ramp | Merge | 0.50 | 21.2 | C | 0.64 | 26.3 | C | 0.49 | 21.0 | C | 0.65 | 26.7 | C |

**TABLE 12**
**FREEWAY LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS**

| Direction | Location | Facility Type | Cumulative No Project | | | | | | Cumulative Plus Project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| | US 50, Empire Ranch Rd. to Latrobe Rd. | Weave | 0.40** | 14.5** | B | 0.50** | 18.1** | C | 0.39** | 14.2** | B | 0.50** | 18.1** | C |
| | Latrobe Rd. Off-Ramp II | Diverge | 0.50 | 21.8 | C | 0.65 | 27.5 | C | 0.49 | 21.4 | C | 0.65 | 27.5 | C |
| | US 50 between Latrobe Rd. Ramps | Basic | 0.42 | 15.0 | B | 0.53 | 19.0 | C | 0.41 | 14.7 | B | 0.53 | 19.1 | C |
| | US 50, Latrobe Rd. to White Rock | Weave | 0.38** | 13.7** | B | NA* | NA* | B | 0.37** | 13.4** | B | NA* | NA* | B |
| Westbound | US 50, Silva Valley Rd. to El Dorado Hills Blvd. | Weave | NA* | NA* | B | 0.34** | 11.6** | B | NA* | NA* | B | 0.33** | 11.5** | B |
| | US 50 between El Dorado Hills Blvd. Ramps | Basic | 0.56 | 19.3 | C | 0.39 | 13.5 | B | 0.56 | 19.3 | C | 0.39 | 13.4 | B |
| | US 50, El Dorado Hills Blvd. to Empire Ranch Rd. | Weave | NA* | NA* | C | NA* | NA* | B | NA* | NA* | C | NA* | NA* | B |
| | US 50 between Empire Ranch Rd. Ramps | Basic | 0.50 | 17.3 | B | 0.46 | 15.7 | B | 0.51 | 17.5 | B | 0.46 | 15.7 | B |
| | Empire Ranch Rd. Loop On-Ramp | Merge | 0.54 | 22.9 | C | 0.54 | 22.5 | C | 0.54 | 22.7 | C | 0.53 | 22.2 | C |
| | US 50, Empire Ranch Rd. to E. Bidwell Rd. | Weave | 0.43** | 14.6** | B | 0.38** | 13.0** | B | 0.43** | 14.6** | B | 0.38** | 12.9** | B |

## TABLE 12
## FREEWAY LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS

| Direction | Location | Facility Type | Cumulative No Project | | | | | | Cumulative Plus Project | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | PM Peak Hour | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS | v/c Ratio[1] | Density (pcplpm)[2] | LOS |
| | US 50 between E. Bidwell Rd. Ramps | Basic | 0.65 | 22.8 | C | 0.58 | 20.2 | C | 0.65 | 22.9 | C | 0.58 | 20.0 | C |
| | E. Bidwell Rd. Loop On-Ramp | Merge | 0.73 | 29.7 | D | 0.70 | 28.6 | D | 0.74 | 30.1 | D | 0.70 | 28.4 | D |
| | US 50, E. Bidwell Rd. to Oak Ave. | Weave | 0.59** | 20.5** | C | 0.56** | 19.1** | C | 0.58** | 20.1** | C | 0.54** | 18.5** | B |
| | US 50 between Oak Ave. Ramps | Basic | 0.74 | 26.7 | D | 0.73 | 26.6 | D | 0.73 | 26.2 | D | 0.71 | 25.4 | C |
| | Oak Ave. Loop On-Ramp | Merge | 0.85 | 33.8 | D | 0.83 | 33.2 | D | 0.83 | 33.4 | D | 0.80 | 32.3 | D |
| | US 50, Oak Ave. to Prairie City Rd. | Weave | NA* | NA* | E | NA* | NA* | D | NA* | NA* | E | NA* | NA* | D |
| | US 50 between Prairie City Rd. Ramps | Basic | 0.85 | 33.2 | D | 0.87 | 34.4 | D | 0.85 | 32.8 | D | 0.85 | 32.9 | D |
| | Prairie City Rd. Loop On-Ramp | Merge | 0.93 | 36.8 | E | 0.92 | 36.6 | E | 0.92 | 36.6 | E | 0.89 | 35.7 | E |
| | Prairie City Rd. to Folsom Blvd. | Weave | 0.63** | 21.8** | C | 0.66** | 23.0** | C | 0.62** | 21.6 | C | 0.64** | 22.4** | B |

Notes: Merge, Diverge, and Basic Segments were analyzed using HCM 2010 methodology. Weave segments were analyzed with the Leisch Method. Weave segments that fell outside of the realm of weaving were analyzed using the HCM 2010 methodology.
1. v/c ratio = volume-to-capacity ratio
2. pcplpm = passenger cars per lane per mile
* Segment analyzed using Leisch Method (v/c ratio and pcplpm not provided).
**Segment fell outside of the realm of weaving and was analyzed using HCM 2010 methodology.
**Bold** indicates unacceptable operations.
**Shaded** indicates significant impact.
*Source: Fehr & Peers, 2014.*

As shown in Table 14, the project will reduce traffic on segments of freeway that are expected to operate at LOS F under Cumulative No Project conditions. The eastbound portion of US 50 between the Prairie City Road Ramps, the eastbound Prairie City Road On-Ramp, and the segment of US 50 between Prairie City Road and Oak Avenue are still forecast to operate at LOS F, but the project will not add traffic to these sections. This is due to the reduction in land use and associated trips under the proposed project scenario.

<u>Mitigation Measure(s)</u>

*No Impact.*

**Impact 8: The proposed project could cause potentially significant impacts to the transit system.**

The project would not disrupt existing or planned transit services or facilities, or create inconsistencies with any adopted plans, guidelines, policies or standards related to transit. Therefore, this impact is considered ***less-than-significant***.

<u>Mitigation Measure(s)</u>

*No Impact.*

**Impact 9: The proposed project could cause potentially significant impacts to bicycle and pedestrian facilities.**

The project will construct curb, gutter, and sidewalk on all project roadways to facilitate any potential pedestrian demand. The curb, gutter, and sidewalk will be designed and constructed to meet City standards.

The project would not disrupt existing or planned bicycle/pedestrian facilities or create inconsistencies with any adopted plans, guidelines, policies or standards related to bicycle or pedestrian systems. Therefore, this impact is considered ***less-than-significant***.

<u>Mitigation Measure(s)</u>

*No Impact.*

# APPENDIX A: TRAFFIC COUNT DATA

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7139-001 E Bidwell Street-Broadstone Parkway.ppd
Date : 3/11/2014

**Unshifted Count = All Vehicles**

| | E Bidwell Street Southbound | | | | | Broadstone Parkway Westbound | | | | | E Bidwell Street Northbound | | | | | Broadstone Parkway Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 12 | 154 | 4 | 0 | 170 | 79 | 40 | 13 | 0 | 132 | 6 | 106 | 23 | 0 | 135 | 2 | 8 | 9 | 0 | 19 | 456 | 0 |
| 07:15 | 15 | 166 | 6 | 0 | 187 | 80 | 26 | 12 | 0 | 118 | 1 | 140 | 25 | 1 | 167 | 1 | 7 | 3 | 2 | 13 | 485 | 3 |
| 07:30 | 37 | 196 | 3 | 2 | 238 | 80 | 68 | 20 | 0 | 168 | 12 | 161 | 44 | 0 | 217 | 3 | 25 | 11 | 0 | 39 | 662 | 2 |
| 07:45 | 45 | 168 | 8 | 1 | 222 | 103 | 70 | 39 | 0 | 212 | 14 | 221 | 34 | 0 | 269 | 5 | 30 | 5 | 1 | 41 | 744 | 2 |
| Total | 109 | 684 | 21 | 3 | 817 | 342 | 204 | 84 | 0 | 630 | 33 | 628 | 126 | 1 | 788 | 11 | 70 | 28 | 3 | 112 | 2347 | 7 |
| 08:00 | 16 | 192 | 1 | 1 | 210 | 67 | 81 | 33 | 0 | 181 | 8 | 226 | 39 | 0 | 273 | 1 | 11 | 11 | 0 | 23 | 687 | 1 |
| 08:15 | 12 | 158 | 4 | 2 | 176 | 71 | 76 | 30 | 0 | 177 | 7 | 236 | 32 | 0 | 275 | 3 | 11 | 11 | 0 | 25 | 653 | 2 |
| 08:30 | 26 | 222 | 2 | 1 | 251 | 61 | 63 | 35 | 0 | 159 | 11 | 300 | 56 | 0 | 367 | 0 | 9 | 5 | 1 | 15 | 792 | 2 |
| 08:45 | 25 | 191 | 8 | 3 | 227 | 56 | 53 | 18 | 0 | 127 | 15 | 367 | 52 | 1 | 435 | 5 | 11 | 10 | 1 | 27 | 816 | 5 |
| Total | 79 | 763 | 15 | 7 | 864 | 255 | 273 | 116 | 0 | 644 | 41 | 1129 | 179 | 1 | 1350 | 9 | 42 | 37 | 2 | 90 | 2948 | 10 |
| 16:00 | 54 | 331 | 17 | 5 | 407 | 48 | 51 | 20 | 0 | 119 | 34 | 257 | 72 | 0 | 363 | 16 | 53 | 10 | 0 | 79 | 968 | 5 |
| 16:15 | 44 | 304 | 11 | 7 | 366 | 54 | 51 | 23 | 1 | 129 | 30 | 276 | 94 | 1 | 401 | 20 | 44 | 12 | 1 | 77 | 973 | 10 |
| 16:30 | 48 | 331 | 12 | 6 | 397 | 49 | 43 | 20 | 0 | 112 | 38 | 265 | 96 | 1 | 400 | 10 | 31 | 6 | 1 | 48 | 957 | 8 |
| 16:45 | 38 | 306 | 15 | 1 | 360 | 48 | 50 | 25 | 0 | 123 | 31 | 323 | 88 | 1 | 443 | 11 | 44 | 10 | 2 | 67 | 993 | 4 |
| Total | 184 | 1272 | 55 | 19 | 1530 | 199 | 195 | 88 | 1 | 483 | 133 | 1121 | 350 | 3 | 1607 | 57 | 172 | 38 | 4 | 271 | 3891 | 27 |
| 17:00 | 44 | 312 | 11 | 7 | 374 | 49 | 47 | 28 | 0 | 124 | 34 | 325 | 99 | 0 | 458 | 24 | 82 | 11 | 2 | 119 | 1075 | 9 |
| 17:15 | 29 | 348 | 13 | 3 | 393 | 63 | 48 | 23 | 0 | 134 | 28 | 303 | 95 | 0 | 426 | 25 | 81 | 19 | 1 | 126 | 1079 | 4 |
| 17:30 | 32 | 328 | 10 | 7 | 377 | 43 | 35 | 30 | 0 | 108 | 35 | 393 | 119 | 1 | 548 | 20 | 59 | 17 | 2 | 98 | 1131 | 10 |
| 17:45 | 38 | 309 | 11 | 4 | 362 | 64 | 38 | 28 | 0 | 130 | 45 | 301 | 107 | 1 | 454 | 21 | 101 | 8 | 2 | 132 | 1078 | 7 |
| Total | 143 | 1297 | 45 | 21 | 1506 | 219 | 168 | 109 | 0 | 496 | 142 | 1322 | 420 | 2 | 1886 | 90 | 323 | 55 | 7 | 475 | 4363 | 30 |
| Grand Total | 515 | 4016 | 136 | 50 | 4717 | 1015 | 840 | 397 | 1 | 2253 | 349 | 4200 | 1075 | 7 | 5631 | 167 | 607 | 158 | 16 | 948 | 13549 | 74 |
| Apprch % | 10.9% | 85.1% | 2.9% | 1.1% | | 45.1% | 37.3% | 17.6% | 0.0% | | 6.2% | 74.6% | 19.1% | 0.1% | | 17.6% | 64.0% | 16.7% | 1.7% | | | |
| Total % | 3.8% | 29.6% | 1.0% | 0.4% | 34.8% | 7.5% | 6.2% | 2.9% | 0.0% | 16.6% | 2.6% | 31.0% | 7.9% | 0.1% | 41.6% | 1.2% | 4.5% | 1.2% | 0.1% | 7.0% | 100.0% | |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7139-001 E Bidwell Street-Broadstone Parkway.ppd
Date : 3/11/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | E Bidwell Street Southbound | | | | | Broadstone Parkway Westbound | | | | | E Bidwell Street Northbound | | | | | Broadstone Parkway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 08:00 to 09:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 08:00 | | | | | | | | | | | | | | | | | | | | | |
| 08:00 | 16 | 192 | 1 | 1 | 210 | 67 | 81 | 33 | 0 | 181 | 8 | 226 | 39 | 0 | 273 | 1 | 11 | 11 | 0 | 23 | 687 |
| 08:15 | 12 | 158 | 4 | 2 | 176 | 71 | 76 | 30 | 0 | 177 | 7 | 236 | 32 | 0 | 275 | 3 | 11 | 11 | 0 | 25 | 653 |
| 08:30 | 26 | 222 | 2 | 1 | 251 | 61 | 63 | 35 | 0 | 159 | 11 | 300 | 56 | 0 | 367 | 0 | 9 | 5 | 1 | 15 | 792 |
| 08:45 | 25 | 191 | 8 | 3 | 227 | 56 | 53 | 18 | 0 | 127 | 15 | 367 | 52 | 1 | 435 | 5 | 11 | 10 | 1 | 27 | 816 |
| Total Volume | 79 | 763 | 15 | 7 | 864 | 255 | 273 | 116 | 0 | 644 | 41 | 1129 | 179 | 1 | 1350 | 9 | 42 | 37 | 2 | 90 | 2948 |
| % App Total | 9.1% | 88.3% | 1.7% | 0.8% | | 39.6% | 42.4% | 18.0% | 0.0% | | 3.0% | 83.6% | 13.3% | 0.1% | | 10.0% | 46.7% | 41.1% | 2.2% | | |
| PHF | .760 | .859 | .469 | .583 | .861 | .898 | .843 | .829 | .000 | .890 | .683 | .769 | .799 | .250 | .776 | .450 | .955 | .841 | .500 | .833 | .903 |

| **PM PEAK HOUR** | E Bidwell Street Southbound | | | | | Broadstone Parkway Westbound | | | | | E Bidwell Street Northbound | | | | | Broadstone Parkway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 44 | 312 | 11 | 7 | 374 | 49 | 47 | 28 | 0 | 124 | 34 | 325 | 99 | 0 | 458 | 24 | 82 | 11 | 2 | 119 | 1075 |
| 17:15 | 29 | 348 | 13 | 3 | 393 | 63 | 48 | 23 | 0 | 134 | 28 | 303 | 95 | 0 | 426 | 25 | 81 | 19 | 1 | 126 | 1079 |
| 17:30 | 32 | 328 | 10 | 7 | 377 | 43 | 35 | 30 | 0 | 108 | 35 | 393 | 119 | 1 | 548 | 20 | 59 | 17 | 2 | 98 | 1131 |
| 17:45 | 38 | 309 | 11 | 4 | 362 | 64 | 38 | 28 | 0 | 130 | 45 | 301 | 107 | 1 | 454 | 21 | 101 | 8 | 2 | 132 | 1078 |
| Total Volume | 143 | 1297 | 45 | 21 | 1506 | 219 | 168 | 109 | 0 | 496 | 142 | 1322 | 420 | 2 | 1886 | 90 | 323 | 55 | 7 | 475 | 4363 |
| % App Total | 9.5% | 86.1% | 3.0% | 1.4% | | 44.2% | 33.9% | 22.0% | 0.0% | | 7.5% | 70.1% | 22.3% | 0.1% | | 18.9% | 68.0% | 11.6% | 1.5% | | |
| PHF | .813 | .932 | .865 | .750 | .958 | .855 | .875 | .908 | .000 | .925 | .789 | .841 | .882 | .500 | .860 | .900 | .800 | .724 | .875 | .900 | .964 |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-001 Empire Ranch Road-Broadstone Parkway.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| | Empire Ranch Road Southbound | | | | | Palomino Court Westbound | | | | | Empire Ranch Road Northbound | | | | | Broadstone Parkway Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 1 | 54 | 6 | 0 | 61 | 1 | 1 | 1 | 0 | 3 | 3 | 10 | 0 | 0 | 13 | 4 | 3 | 3 | 0 | 10 | 87 | 0 |
| 07:15 | 1 | 58 | 24 | 0 | 83 | 2 | 2 | 2 | 0 | 6 | 4 | 25 | 0 | 0 | 29 | 5 | 0 | 2 | 0 | 7 | 125 | 0 |
| 07:30 | 0 | 77 | 78 | 0 | 155 | 1 | 10 | 2 | 0 | 13 | 6 | 20 | 1 | 0 | 27 | 16 | 1 | 4 | 0 | 21 | 216 | 0 |
| 07:45 | 1 | 86 | 116 | 0 | 203 | 2 | 5 | 3 | 0 | 10 | 16 | 21 | 0 | 0 | 37 | 19 | 1 | 24 | 0 | 44 | 294 | 0 |
| Total | 3 | 275 | 224 | 0 | 502 | 6 | 18 | 8 | 0 | 32 | 29 | 76 | 1 | 0 | 106 | 44 | 5 | 33 | 0 | 82 | 722 | 0 |
| 08:00 | 12 | 100 | 23 | 0 | 135 | 1 | 10 | 5 | 0 | 16 | 34 | 41 | 1 | 0 | 76 | 16 | 7 | 40 | 0 | 63 | 290 | 0 |
| 08:15 | 9 | 97 | 25 | 0 | 131 | 3 | 10 | 9 | 0 | 22 | 51 | 54 | 1 | 0 | 106 | 19 | 6 | 35 | 0 | 60 | 319 | 0 |
| 08:30 | 3 | 56 | 23 | 0 | 82 | 2 | 6 | 4 | 0 | 12 | 13 | 24 | 0 | 0 | 37 | 6 | 2 | 8 | 0 | 16 | 147 | 0 |
| 08:45 | 2 | 52 | 22 | 0 | 76 | 4 | 8 | 0 | 0 | 12 | 5 | 14 | 0 | 0 | 19 | 5 | 2 | 7 | 0 | 14 | 121 | 0 |
| Total | 26 | 305 | 93 | 0 | 424 | 10 | 34 | 18 | 0 | 62 | 103 | 133 | 2 | 0 | 238 | 46 | 17 | 90 | 0 | 153 | 877 | 0 |
| 16:00 | 7 | 28 | 14 | 0 | 49 | 0 | 3 | 7 | 0 | 10 | 10 | 68 | 0 | 0 | 78 | 24 | 6 | 3 | 0 | 33 | 170 | 0 |
| 16:15 | 5 | 28 | 18 | 0 | 51 | 1 | 3 | 0 | 0 | 4 | 6 | 74 | 1 | 0 | 81 | 27 | 5 | 6 | 0 | 38 | 174 | 0 |
| 16:30 | 2 | 36 | 25 | 0 | 63 | 0 | 6 | 3 | 0 | 9 | 10 | 61 | 4 | 0 | 75 | 22 | 4 | 3 | 0 | 29 | 176 | 0 |
| 16:45 | 3 | 42 | 22 | 0 | 67 | 1 | 5 | 3 | 0 | 9 | 4 | 88 | 1 | 0 | 93 | 25 | 6 | 8 | 0 | 39 | 208 | 0 |
| Total | 17 | 134 | 79 | 0 | 230 | 2 | 17 | 13 | 0 | 32 | 30 | 291 | 6 | 0 | 327 | 98 | 21 | 20 | 0 | 139 | 728 | 0 |
| 17:00 | 2 | 33 | 21 | 0 | 56 | 0 | 2 | 2 | 0 | 4 | 10 | 68 | 4 | 0 | 82 | 28 | 10 | 6 | 0 | 44 | 186 | 0 |
| 17:15 | 1 | 26 | 20 | 0 | 47 | 1 | 3 | 2 | 0 | 6 | 6 | 83 | 0 | 0 | 89 | 25 | 3 | 11 | 0 | 39 | 181 | 0 |
| 17:30 | 4 | 48 | 27 | 0 | 79 | 0 | 7 | 3 | 0 | 10 | 8 | 87 | 2 | 0 | 97 | 24 | 3 | 6 | 0 | 33 | 219 | 0 |
| 17:45 | 5 | 31 | 17 | 0 | 53 | 0 | 5 | 3 | 0 | 8 | 4 | 83 | 1 | 0 | 88 | 32 | 8 | 2 | 0 | 42 | 191 | 0 |
| Total | 12 | 138 | 85 | 0 | 235 | 1 | 17 | 10 | 0 | 28 | 28 | 321 | 7 | 0 | 356 | 109 | 24 | 25 | 0 | 158 | 777 | 0 |
| Grand Total | 58 | 852 | 481 | 0 | 1391 | 19 | 86 | 49 | 0 | 154 | 190 | 821 | 16 | 0 | 1027 | 297 | 67 | 168 | 0 | 532 | 3104 | 0 |
| Apprch % | 4.2% | 61.3% | 34.6% | 0.0% | | 12.3% | 55.8% | 31.8% | 0.0% | | 18.5% | 79.9% | 1.6% | 0.0% | | 55.8% | 12.6% | 31.6% | 0.0% | | | |
| Total % | 1.9% | 27.4% | 15.5% | 0.0% | 44.8% | 0.6% | 2.8% | 1.6% | 0.0% | 5.0% | 6.1% | 26.4% | 0.5% | 0.0% | 33.1% | 9.6% | 2.2% | 5.4% | 0.0% | 17.1% | 100.0% | |

# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-001 Empire Ranch Road-Broadstone Parkway.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Empire Ranch Road Southbound | | | | | Palomino Court Westbound | | | | | Empire Ranch Road Northbound | | | | | Broadstone Parkway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 07:30 | 0 | 77 | 78 | 0 | 155 | 1 | 10 | 2 | 0 | 13 | 6 | 20 | 1 | 0 | 27 | 16 | 1 | 4 | 0 | 21 | 216 |
| 07:45 | 1 | 86 | 116 | 0 | 203 | 2 | 5 | 3 | 0 | 10 | 16 | 21 | 0 | 0 | 37 | 19 | 1 | 24 | 0 | 44 | 294 |
| 08:00 | 12 | 100 | 23 | 0 | 135 | 1 | 10 | 5 | 0 | 16 | 34 | 41 | 1 | 0 | 76 | 16 | 7 | 40 | 0 | 63 | 290 |
| 08:15 | 9 | 97 | 25 | 0 | 131 | 3 | 10 | 9 | 0 | 22 | 51 | 54 | 1 | 0 | 106 | 19 | 6 | 35 | 0 | 60 | 319 |
| Total Volume | 22 | 360 | 242 | 0 | 624 | 7 | 35 | 19 | 0 | 61 | 107 | 136 | 3 | 0 | 246 | 70 | 15 | 103 | 0 | 188 | 1119 |
| % App Total | 3.5% | 57.7% | 38.8% | 0.0% | | 11.5% | 57.4% | 31.1% | 0.0% | | 43.5% | 55.3% | 1.2% | 0.0% | | 37.2% | 8.0% | 54.8% | 0.0% | | |
| PHF | .458 | .900 | .522 | .000 | .768 | .583 | .875 | .528 | .000 | .693 | .525 | .630 | .750 | .000 | .580 | .921 | .536 | .644 | .000 | .746 | .877 |

| **PM PEAK HOUR** | Empire Ranch Road Southbound | | | | | Palomino Court Westbound | | | | | Empire Ranch Road Northbound | | | | | Broadstone Parkway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 3 | 42 | 22 | 0 | 67 | 1 | 5 | 3 | 0 | 9 | 4 | 88 | 1 | 0 | 93 | 25 | 6 | 8 | 0 | 39 | 208 |
| 17:00 | 2 | 33 | 21 | 0 | 56 | 0 | 2 | 2 | 0 | 4 | 10 | 68 | 4 | 0 | 82 | 28 | 10 | 6 | 0 | 44 | 186 |
| 17:15 | 1 | 26 | 20 | 0 | 47 | 1 | 3 | 2 | 0 | 6 | 6 | 83 | 0 | 0 | 89 | 25 | 3 | 11 | 0 | 39 | 181 |
| 17:30 | 4 | 48 | 27 | 0 | 79 | 0 | 7 | 3 | 0 | 10 | 8 | 87 | 2 | 0 | 97 | 24 | 3 | 6 | 0 | 33 | 219 |
| Total Volume | 10 | 149 | 90 | 0 | 249 | 2 | 17 | 10 | 0 | 29 | 28 | 326 | 7 | 0 | 361 | 102 | 22 | 31 | 0 | 155 | 794 |
| % App Total | 4.0% | 59.8% | 36.1% | 0.0% | | 6.9% | 58.6% | 34.5% | 0.0% | | 7.8% | 90.3% | 1.9% | 0.0% | | 65.8% | 14.2% | 20.0% | 0.0% | | |
| PHF | .625 | .776 | .833 | .000 | .788 | .500 | .607 | .833 | .000 | .725 | .700 | .926 | .438 | .000 | .930 | .911 | .550 | .705 | .000 | .881 | .906 |

# ALL TRAFFIC DATA

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

**(916) 771-8700**
orders@atdtraffic.com

File Name : 14-7318-005 Broadstone Parkway-Iron Point Road.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| | Broadstone Parkway Southbound | | | | | Iron Point Road Westbound | | | | | Broadstone Parkway Northbound | | | | | Iron Point Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 10 | 4 | 32 | 2 | 48 | 14 | 43 | 1 | 1 | 59 | 1 | 4 | 1 | 0 | 6 | 9 | 31 | 7 | 2 | 49 | 162 | 5 |
| 07:15 | 7 | 4 | 30 | 0 | 41 | 16 | 63 | 2 | 1 | 82 | 3 | 1 | 1 | 0 | 5 | 10 | 27 | 7 | 3 | 47 | 175 | 4 |
| 07:30 | 9 | 4 | 75 | 0 | 88 | 12 | 73 | 1 | 0 | 86 | 0 | 0 | 1 | 0 | 1 | 19 | 44 | 12 | 1 | 76 | 251 | 1 |
| 07:45 | 11 | 19 | 77 | 1 | 108 | 34 | 95 | 3 | 1 | 133 | 3 | 0 | 1 | 0 | 4 | 25 | 48 | 27 | 1 | 101 | 346 | 3 |
| Total | 37 | 31 | 214 | 3 | 285 | 76 | 274 | 7 | 3 | 360 | 7 | 5 | 4 | 0 | 16 | 63 | 150 | 53 | 7 | 273 | 934 | 13 |
| 08:00 | 10 | 6 | 75 | 1 | 92 | 21 | 114 | 6 | 0 | 141 | 3 | 2 | 3 | 0 | 8 | 12 | 57 | 18 | 2 | 89 | 330 | 3 |
| 08:15 | 20 | 14 | 57 | 0 | 91 | 16 | 127 | 7 | 0 | 150 | 4 | 2 | 1 | 0 | 7 | 17 | 55 | 13 | 0 | 85 | 333 | 0 |
| 08:30 | 11 | 6 | 73 | 0 | 90 | 16 | 104 | 5 | 0 | 125 | 1 | 1 | 2 | 0 | 4 | 10 | 40 | 6 | 0 | 56 | 275 | 0 |
| 08:45 | 6 | 7 | 61 | 1 | 75 | 10 | 101 | 3 | 2 | 116 | 2 | 1 | 3 | 0 | 6 | 15 | 57 | 3 | 2 | 77 | 274 | 5 |
| Total | 47 | 33 | 266 | 2 | 348 | 63 | 446 | 21 | 2 | 532 | 10 | 6 | 9 | 0 | 25 | 54 | 209 | 40 | 4 | 307 | 1212 | 8 |
| 16:00 | 12 | 4 | 28 | 0 | 44 | 1 | 79 | 5 | 5 | 90 | 24 | 17 | 12 | 0 | 53 | 60 | 142 | 7 | 1 | 210 | 397 | 6 |
| 16:15 | 7 | 2 | 33 | 0 | 42 | 2 | 84 | 14 | 0 | 100 | 20 | 8 | 12 | 0 | 40 | 58 | 144 | 6 | 3 | 211 | 393 | 3 |
| 16:30 | 11 | 6 | 35 | 0 | 52 | 2 | 62 | 3 | 1 | 68 | 18 | 5 | 17 | 0 | 40 | 63 | 173 | 10 | 8 | 254 | 414 | 9 |
| 16:45 | 10 | 7 | 29 | 1 | 47 | 5 | 86 | 9 | 0 | 100 | 15 | 13 | 10 | 0 | 38 | 82 | 139 | 6 | 9 | 236 | 421 | 10 |
| Total | 40 | 19 | 125 | 1 | 185 | 10 | 311 | 31 | 6 | 358 | 77 | 43 | 51 | 0 | 171 | 263 | 598 | 29 | 21 | 911 | 1625 | 28 |
| 17:00 | 16 | 4 | 48 | 0 | 68 | 5 | 68 | 19 | 2 | 94 | 47 | 26 | 23 | 0 | 96 | 115 | 195 | 10 | 6 | 326 | 584 | 8 |
| 17:15 | 22 | 6 | 41 | 2 | 71 | 3 | 67 | 8 | 2 | 80 | 19 | 17 | 16 | 0 | 52 | 98 | 194 | 5 | 9 | 306 | 509 | 13 |
| 17:30 | 20 | 9 | 44 | 0 | 73 | 3 | 75 | 12 | 2 | 92 | 19 | 17 | 12 | 0 | 48 | 103 | 156 | 14 | 6 | 279 | 492 | 8 |
| 17:45 | 18 | 4 | 45 | 2 | 69 | 6 | 76 | 13 | 2 | 97 | 13 | 11 | 9 | 1 | 34 | 109 | 176 | 12 | 11 | 308 | 508 | 16 |
| Total | 76 | 23 | 178 | 4 | 281 | 17 | 286 | 52 | 8 | 363 | 98 | 71 | 60 | 1 | 230 | 425 | 721 | 41 | 32 | 1219 | 2093 | 45 |
| Grand Total | 200 | 106 | 783 | 10 | 1099 | 166 | 1317 | 111 | 19 | 1613 | 192 | 125 | 124 | 1 | 442 | 805 | 1678 | 163 | 64 | 2710 | 5864 | 94 |
| Apprch % | 18.2% | 9.6% | 71.2% | 0.9% | | 10.3% | 81.6% | 6.9% | 1.2% | | 43.4% | 28.3% | 28.1% | 0.2% | | 29.7% | 61.9% | 6.0% | 2.4% | | | |
| Total % | 3.4% | 1.8% | 13.4% | 0.2% | 18.7% | 2.8% | 22.5% | 1.9% | 0.3% | 27.5% | 3.3% | 2.1% | 2.1% | 0.0% | 7.5% | 13.7% | 28.6% | 2.8% | 1.1% | 46.2% | 100.0% | |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-005 Broadstone Parkway-Iron Point Road.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Broadstone Parkway Southbound | | | | | Iron Point Road Westbound | | | | | Broadstone Parkway Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 07:45 | 11 | 19 | 77 | 1 | 108 | 34 | 95 | 3 | 1 | 133 | 3 | 0 | 1 | 0 | 4 | 25 | 48 | 27 | 1 | 101 | 346 |
| 08:00 | 10 | 6 | 75 | 1 | 92 | 21 | 114 | 6 | 0 | 141 | 3 | 2 | 3 | 0 | 8 | 12 | 57 | 18 | 2 | 89 | 330 |
| 08:15 | 20 | 14 | 57 | 0 | 91 | 16 | 127 | 7 | 0 | 150 | 4 | 2 | 1 | 0 | 7 | 17 | 55 | 13 | 0 | 85 | 333 |
| 08:30 | 11 | 6 | 73 | 0 | 90 | 16 | 104 | 5 | 0 | 125 | 1 | 1 | 2 | 0 | 4 | 10 | 40 | 6 | 0 | 56 | 275 |
| Total Volume | 52 | 45 | 282 | 2 | 381 | 87 | 440 | 21 | 1 | 549 | 11 | 5 | 7 | 0 | 23 | 64 | 200 | 64 | 3 | 331 | 1284 |
| % App Total | 13.6% | 11.8% | 74.0% | 0.5% | | 15.8% | 80.1% | 3.8% | 0.2% | | 47.8% | 21.7% | 30.4% | 0.0% | | 19.3% | 60.4% | 19.3% | 0.9% | | |
| PHF | .650 | .592 | .916 | .500 | .882 | .640 | .866 | .750 | .250 | .915 | .688 | .625 | .583 | .000 | .719 | .640 | .877 | .593 | .375 | .819 | .928 |

| **PM PEAK HOUR** | Broadstone Parkway Southbound | | | | | Iron Point Road Westbound | | | | | Broadstone Parkway Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 16 | 4 | 48 | 0 | 68 | 5 | 68 | 19 | 2 | 94 | 47 | 26 | 23 | 0 | 96 | 115 | 195 | 10 | 6 | 326 | 584 |
| 17:15 | 22 | 6 | 41 | 2 | 71 | 3 | 67 | 8 | 2 | 80 | 19 | 17 | 16 | 0 | 52 | 98 | 194 | 5 | 9 | 306 | 509 |
| 17:30 | 20 | 9 | 44 | 0 | 73 | 3 | 75 | 12 | 2 | 92 | 19 | 17 | 12 | 0 | 48 | 103 | 156 | 14 | 6 | 279 | 492 |
| 17:45 | 18 | 4 | 45 | 2 | 69 | 6 | 76 | 13 | 2 | 97 | 13 | 11 | 9 | 1 | 34 | 109 | 176 | 12 | 11 | 308 | 508 |
| Total Volume | 76 | 23 | 178 | 4 | 281 | 17 | 286 | 52 | 8 | 363 | 98 | 71 | 60 | 1 | 230 | 425 | 721 | 41 | 32 | 1219 | 2093 |
| % App Total | 27.0% | 8.2% | 63.3% | 1.4% | | 4.7% | 78.8% | 14.3% | 2.2% | | 42.6% | 30.9% | 26.1% | 0.4% | | 34.9% | 59.1% | 3.4% | 2.6% | | |
| PHF | .864 | .639 | .927 | .500 | .962 | .708 | .941 | .684 | 1.000 | .936 | .521 | .683 | .652 | .250 | .599 | .924 | .924 | .732 | .727 | .935 | .896 |

# ALL TRAFFIC DATA

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7632-003 E Bidwell Street-Iron Point Road.ppd
Date : 11/5/2013

**Unshifted Count = All Vehicles**

| | E Bidwell Street Southbound | | | | | Iron Point Road Westbound | | | | | E Bidwell Street Northbound | | | | | Iron Point Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 12 | 240 | 9 | 0 | 261 | 141 | 27 | 5 | 0 | 173 | 47 | 152 | 37 | 15 | 251 | 5 | 4 | 44 | 3 | 56 | 741 | 18 |
| 07:15 | 7 | 235 | 2 | 0 | 244 | 96 | 33 | 15 | 0 | 144 | 82 | 166 | 48 | 20 | 316 | 4 | 1 | 53 | 1 | 59 | 763 | 21 |
| 07:30 | 8 | 278 | 4 | 0 | 290 | 123 | 40 | 14 | 0 | 177 | 86 | 207 | 62 | 15 | 370 | 6 | 5 | 74 | 1 | 86 | 923 | 16 |
| 07:45 | 11 | 253 | 7 | 0 | 271 | 125 | 47 | 16 | 0 | 188 | 169 | 299 | 62 | 11 | 541 | 7 | 8 | 70 | 0 | 85 | 1085 | 11 |
| Total | 38 | 1006 | 22 | 0 | 1066 | 485 | 147 | 50 | 0 | 682 | 384 | 824 | 209 | 61 | 1478 | 22 | 18 | 241 | 5 | 286 | 3512 | 66 |
| 08:00 | 16 | 214 | 4 | 0 | 234 | 142 | 54 | 14 | 0 | 210 | 111 | 277 | 64 | 18 | 470 | 11 | 20 | 50 | 0 | 81 | 995 | 18 |
| 08:15 | 10 | 215 | 10 | 0 | 235 | 117 | 59 | 33 | 0 | 209 | 124 | 269 | 54 | 13 | 460 | 7 | 12 | 63 | 1 | 83 | 987 | 14 |
| 08:30 | 14 | 263 | 11 | 0 | 288 | 108 | 44 | 19 | 0 | 171 | 102 | 330 | 51 | 27 | 510 | 10 | 8 | 56 | 2 | 76 | 1045 | 29 |
| 08:45 | 19 | 207 | 27 | 0 | 253 | 82 | 29 | 15 | 0 | 126 | 127 | 389 | 49 | 23 | 588 | 12 | 9 | 56 | 1 | 78 | 1045 | 24 |
| Total | 59 | 899 | 52 | 0 | 1010 | 449 | 186 | 81 | 0 | 716 | 464 | 1265 | 218 | 81 | 2028 | 40 | 49 | 225 | 4 | 318 | 4072 | 85 |
| 16:00 | 52 | 344 | 29 | 1 | 426 | 86 | 39 | 28 | 1 | 154 | 114 | 314 | 126 | 17 | 571 | 37 | 63 | 141 | 4 | 245 | 1396 | 23 |
| 16:15 | 36 | 296 | 46 | 2 | 380 | 117 | 35 | 32 | 0 | 184 | 104 | 313 | 136 | 8 | 561 | 33 | 63 | 143 | 0 | 239 | 1364 | 10 |
| 16:30 | 39 | 322 | 30 | 1 | 392 | 109 | 32 | 46 | 0 | 187 | 134 | 322 | 155 | 20 | 631 | 42 | 51 | 135 | 1 | 229 | 1439 | 22 |
| 16:45 | 46 | 287 | 33 | 0 | 366 | 85 | 33 | 25 | 0 | 143 | 148 | 365 | 141 | 23 | 677 | 38 | 71 | 135 | 1 | 245 | 1431 | 24 |
| Total | 173 | 1249 | 138 | 4 | 1564 | 397 | 139 | 131 | 1 | 668 | 500 | 1314 | 558 | 68 | 2440 | 150 | 248 | 554 | 6 | 958 | 5630 | 79 |
| 17:00 | 43 | 340 | 51 | 1 | 435 | 119 | 31 | 34 | 0 | 184 | 94 | 328 | 137 | 8 | 567 | 43 | 98 | 132 | 1 | 274 | 1460 | 10 |
| 17:15 | 39 | 343 | 32 | 0 | 414 | 99 | 23 | 39 | 0 | 161 | 135 | 403 | 154 | 27 | 719 | 35 | 80 | 158 | 4 | 277 | 1571 | 31 |
| 17:30 | 50 | 288 | 47 | 3 | 388 | 106 | 38 | 39 | 0 | 183 | 126 | 377 | 153 | 18 | 674 | 40 | 81 | 157 | 3 | 281 | 1526 | 24 |
| 17:45 | 42 | 315 | 55 | 0 | 412 | 78 | 35 | 34 | 0 | 147 | 119 | 359 | 121 | 14 | 613 | 50 | 83 | 145 | 4 | 282 | 1454 | 18 |
| Total | 174 | 1286 | 185 | 4 | 1649 | 402 | 127 | 146 | 0 | 675 | 474 | 1467 | 565 | 67 | 2573 | 168 | 342 | 592 | 12 | 1114 | 6011 | 83 |
| Grand Total | 444 | 4440 | 397 | 8 | 5289 | 1733 | 599 | 408 | 1 | 2741 | 1822 | 4870 | 1550 | 277 | 8519 | 380 | 657 | 1612 | 27 | 2676 | 19225 | 313 |
| Apprch % | 8.4% | 83.9% | 7.5% | 0.2% | | 63.2% | 21.9% | 14.9% | 0.0% | | 21.4% | 57.2% | 18.2% | 3.3% | | 14.2% | 24.6% | 60.2% | 1.0% | | | |
| Total % | 2.3% | 23.1% | 2.1% | 0.0% | 27.5% | 9.0% | 3.1% | 2.1% | 0.0% | 14.3% | 9.5% | 25.3% | 8.1% | 1.4% | 44.3% | 2.0% | 3.4% | 8.4% | 0.1% | 13.9% | 100.0% | |

| AM PEAK HOUR | E Bidwell Street Southbound | | | | | Iron Point Road Westbound | | | | | E Bidwell Street Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 07:45 | 11 | 253 | 7 | 0 | 271 | 125 | 47 | 16 | 0 | 188 | 169 | 299 | 62 | 11 | 541 | 7 | 8 | 70 | 0 | 85 | 1085 |
| 08:00 | 16 | 214 | 4 | 0 | 234 | 142 | 54 | 14 | 0 | 210 | 111 | 277 | 64 | 18 | 470 | 11 | 20 | 50 | 0 | 81 | 995 |
| 08:15 | 10 | 215 | 10 | 0 | 235 | 117 | 59 | 33 | 0 | 209 | 124 | 269 | 54 | 13 | 460 | 7 | 12 | 63 | 1 | 83 | 987 |
| 08:30 | 14 | 263 | 11 | 0 | 288 | 108 | 44 | 19 | 0 | 171 | 102 | 330 | 51 | 27 | 510 | 10 | 8 | 56 | 2 | 76 | 1045 |
| Total Volume | 51 | 945 | 32 | 0 | 1028 | 492 | 204 | 82 | 0 | 778 | 506 | 1175 | 231 | 69 | 1981 | 35 | 48 | 239 | 3 | 325 | 4112 |
| % App Total | 5.0% | 91.9% | 3.1% | 0.0% | | 63.2% | 26.2% | 10.5% | 0.0% | | 25.5% | 59.3% | 11.7% | 3.5% | | 10.8% | 14.8% | 73.5% | 0.9% | | |
| PHF | .797 | .898 | .727 | .000 | .892 | .866 | .864 | .621 | .000 | .926 | .749 | .890 | .902 | .639 | .915 | .795 | .600 | .854 | .375 | .956 | .947 |

| PM PEAK HOUR | E Bidwell Street Southbound | | | | | Iron Point Road Westbound | | | | | E Bidwell Street Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 43 | 340 | 51 | 1 | 435 | 119 | 31 | 34 | 0 | 184 | 94 | 328 | 137 | 8 | 567 | 43 | 98 | 132 | 1 | 274 | 1460 |
| 17:15 | 39 | 343 | 32 | 0 | 414 | 99 | 23 | 39 | 0 | 161 | 135 | 403 | 154 | 27 | 719 | 35 | 80 | 158 | 4 | 277 | 1571 |
| 17:30 | 50 | 288 | 47 | 3 | 388 | 106 | 38 | 39 | 0 | 183 | 126 | 377 | 153 | 18 | 674 | 40 | 81 | 157 | 3 | 281 | 1526 |
| 17:45 | 42 | 315 | 55 | 0 | 412 | 78 | 35 | 34 | 0 | 147 | 119 | 359 | 121 | 14 | 613 | 50 | 83 | 145 | 4 | 282 | 1454 |
| Total Volume | 174 | 1286 | 185 | 4 | 1649 | 402 | 127 | 146 | 0 | 675 | 474 | 1467 | 565 | 67 | 2573 | 168 | 342 | 592 | 12 | 1114 | 6011 |
| % App Total | 10.6% | 78.0% | 11.2% | 0.2% | | 59.6% | 18.8% | 21.6% | 0.0% | | 18.4% | 57.0% | 22.0% | 2.6% | | 15.1% | 30.7% | 53.1% | 1.1% | | |
| PHF | .870 | .937 | .841 | .333 | .948 | .845 | .836 | .936 | .000 | .917 | .878 | .910 | .917 | .620 | .895 | .840 | .872 | .937 | .750 | .988 | .957 |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7139-006 Empire Ranch Road-Iron Point Road.ppd
Date : 3/11/2014

**Unshifted Count = All Vehicles**

| | Empire Ranch Road | | | | | Iron Point Road | | | | | | | | | | Iron Point Road | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Southbound | | | | | Westbound | | | | | Northbound | | | | | Eastbound | | | | | | |
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 1 | 0 | 63 | 0 | 64 | 0 | 19 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 20 | 5 | 0 | 0 | 25 | 108 | 0 |
| 07:15 | 0 | 0 | 72 | 1 | 73 | 0 | 22 | 3 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 20 | 7 | 0 | 0 | 27 | 125 | 1 |
| 07:30 | 0 | 0 | 60 | 0 | 60 | 0 | 20 | 2 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 17 | 15 | 0 | 1 | 33 | 115 | 1 |
| 07:45 | 2 | 0 | 102 | 0 | 104 | 0 | 29 | 5 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 22 | 16 | 0 | 0 | 38 | 176 | 0 |
| Total | 3 | 0 | 297 | 1 | 301 | 0 | 90 | 10 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 79 | 43 | 0 | 1 | 123 | 524 | 2 |
| 08:00 | 6 | 0 | 85 | 0 | 91 | 0 | 45 | 5 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 29 | 43 | 0 | 1 | 73 | 214 | 1 |
| 08:15 | 7 | 0 | 69 | 0 | 76 | 0 | 91 | 7 | 0 | 98 | 0 | 0 | 0 | 0 | 0 | 27 | 36 | 0 | 1 | 64 | 238 | 1 |
| 08:30 | 1 | 0 | 64 | 0 | 65 | 0 | 35 | 2 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 19 | 7 | 0 | 0 | 26 | 128 | 0 |
| 08:45 | 2 | 0 | 61 | 0 | 63 | 0 | 15 | 2 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 8 | 11 | 0 | 0 | 19 | 99 | 0 |
| Total | 16 | 0 | 279 | 0 | 295 | 0 | 186 | 16 | 0 | 202 | 0 | 0 | 0 | 0 | 0 | 83 | 97 | 0 | 2 | 182 | 679 | 2 |
| 16:00 | 0 | 0 | 39 | 0 | 39 | 0 | 16 | 4 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 50 | 21 | 0 | 0 | 71 | 130 | 0 |
| 16:15 | 0 | 0 | 30 | 0 | 30 | 0 | 8 | 3 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 60 | 21 | 0 | 0 | 81 | 122 | 0 |
| 16:30 | 0 | 0 | 24 | 0 | 24 | 0 | 11 | 5 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 60 | 20 | 0 | 1 | 81 | 121 | 1 |
| 16:45 | 1 | 0 | 41 | 1 | 43 | 0 | 8 | 3 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 69 | 21 | 0 | 0 | 90 | 144 | 1 |
| Total | 1 | 0 | 134 | 1 | 136 | 0 | 43 | 15 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 239 | 83 | 0 | 1 | 323 | 517 | 2 |
| 17:00 | 2 | 0 | 34 | 1 | 37 | 0 | 19 | 2 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 95 | 20 | 0 | 0 | 115 | 173 | 1 |
| 17:15 | 1 | 0 | 23 | 0 | 24 | 0 | 14 | 1 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 91 | 38 | 0 | 0 | 129 | 168 | 0 |
| 17:30 | 0 | 0 | 40 | 0 | 40 | 0 | 16 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 105 | 37 | 0 | 1 | 143 | 200 | 1 |
| 17:45 | 0 | 0 | 31 | 1 | 32 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 76 | 21 | 0 | 0 | 97 | 137 | 1 |
| Total | 3 | 0 | 128 | 2 | 133 | 0 | 56 | 5 | 0 | 61 | 0 | 0 | 0 | 0 | 0 | 367 | 116 | 0 | 1 | 484 | 678 | 3 |
| Grand Total | 23 | 0 | 838 | 4 | 865 | 0 | 375 | 46 | 0 | 421 | 0 | 0 | 0 | 0 | 0 | 768 | 339 | 0 | 5 | 1112 | 2398 | 9 |
| Apprch % | 2.7% | 0.0% | 96.9% | 0.5% | | 0.0% | 89.1% | 10.9% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 69.1% | 30.5% | 0.0% | 0.4% | | | |
| Total % | 1.0% | 0.0% | 34.9% | 0.2% | 36.1% | 0.0% | 15.6% | 1.9% | 0.0% | 17.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 32.0% | 14.1% | 0.0% | 0.2% | 46.4% | 100.0% | |

# ALL TRAFFIC DATA

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

**(916) 771-8700**
orders@atdtraffic.com

File Name : 14-7139-006 Empire Ranch Road-Iron Point Road.ppd
Date : 3/11/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Empire Ranch Road Southbound | | | | | Iron Point Road Westbound | | | | | Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 07:45 | 2 | 0 | 102 | 0 | 104 | 0 | 29 | 5 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 22 | 16 | 0 | 0 | 38 | 176 |
| 08:00 | 6 | 0 | 85 | 0 | 91 | 0 | 45 | 5 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 29 | 43 | 0 | 1 | 73 | 214 |
| 08:15 | 7 | 0 | 69 | 0 | 76 | 0 | 91 | 7 | 0 | 98 | 0 | 0 | 0 | 0 | 0 | 27 | 36 | 0 | 1 | 64 | 238 |
| 08:30 | 1 | 0 | 64 | 0 | 65 | 0 | 35 | 2 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 19 | 7 | 0 | 0 | 26 | 128 |
| Total Volume | 16 | 0 | 320 | 0 | 336 | 0 | 200 | 19 | 0 | 219 | 0 | 0 | 0 | 0 | 0 | 97 | 102 | 0 | 2 | 201 | 756 |
| % App Total | 4.8% | 0.0% | 95.2% | 0.0% | | 0.0% | 91.3% | 8.7% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 48.3% | 50.7% | 0.0% | 1.0% | | |
| PHF | .571 | .000 | .784 | .000 | .808 | .000 | .549 | .679 | .000 | .559 | .000 | .000 | .000 | .000 | .000 | .836 | .593 | .000 | .500 | .688 | .794 |

| **PM PEAK HOUR** | Empire Ranch Road Southbound | | | | | Iron Point Road Westbound | | | | | Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 1 | 0 | 41 | 1 | 43 | 0 | 8 | 3 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 69 | 21 | 0 | 0 | 90 | 144 |
| 17:00 | 2 | 0 | 34 | 1 | 37 | 0 | 19 | 2 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 95 | 20 | 0 | 0 | 115 | 173 |
| 17:15 | 1 | 0 | 23 | 0 | 24 | 0 | 14 | 1 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 91 | 38 | 0 | 0 | 129 | 168 |
| 17:30 | 0 | 0 | 40 | 0 | 40 | 0 | 16 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 105 | 37 | 0 | 1 | 143 | 200 |
| Total Volume | 4 | 0 | 138 | 2 | 144 | 0 | 57 | 7 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 360 | 116 | 0 | 1 | 477 | 685 |
| % App Total | 2.8% | 0.0% | 95.8% | 1.4% | | 0.0% | 89.1% | 10.9% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 75.5% | 24.3% | 0.0% | 0.2% | | |
| PHF | .500 | .000 | .841 | .500 | .837 | .000 | .750 | .583 | .000 | .762 | .000 | .000 | .000 | .000 | .000 | .857 | .763 | .000 | .250 | .834 | .856 |

# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 13-7632-004 E Bidwell Street-Placerville Road.ppd
Date : 11/5/2013

**Unshifted Count = All Vehicles**

| | E Bidwell Street Southbound | | | | | Placerville Road Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Westbound On Ramp Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 26 | 143 | 293 | 0 | 462 | 0 | 0 | 52 | 0 | 52 | 0 | 190 | 29 | 0 | 219 | 0 | 0 | 0 | 0 | 0 | 733 | 0 |
| 07:15 | 29 | 153 | 233 | 0 | 415 | 0 | 0 | 59 | 0 | 59 | 0 | 240 | 24 | 0 | 264 | 0 | 0 | 0 | 0 | 0 | 738 | 0 |
| 07:30 | 39 | 219 | 222 | 0 | 480 | 0 | 0 | 57 | 0 | 57 | 0 | 329 | 22 | 0 | 351 | 0 | 0 | 0 | 0 | 0 | 888 | 0 |
| 07:45 | 43 | 177 | 250 | 0 | 470 | 0 | 0 | 86 | 0 | 86 | 0 | 443 | 44 | 0 | 487 | 0 | 0 | 0 | 0 | 0 | 1043 | 0 |
| Total | 137 | 692 | 998 | 0 | 1827 | 0 | 0 | 254 | 0 | 254 | 0 | 1202 | 119 | 0 | 1321 | 0 | 0 | 0 | 0 | 0 | 3402 | 0 |
| 08:00 | 43 | 163 | 214 | 0 | 420 | 0 | 0 | 81 | 0 | 81 | 0 | 396 | 29 | 0 | 425 | 0 | 0 | 0 | 0 | 0 | 926 | 0 |
| 08:15 | 42 | 160 | 198 | 0 | 400 | 0 | 0 | 73 | 0 | 73 | 0 | 377 | 40 | 0 | 417 | 0 | 0 | 0 | 0 | 0 | 890 | 0 |
| 08:30 | 45 | 196 | 226 | 0 | 467 | 0 | 0 | 113 | 0 | 113 | 0 | 418 | 32 | 0 | 450 | 0 | 0 | 0 | 0 | 0 | 1030 | 0 |
| 08:45 | 40 | 165 | 155 | 0 | 360 | 0 | 0 | 69 | 0 | 69 | 0 | 501 | 32 | 0 | 533 | 0 | 0 | 0 | 0 | 0 | 962 | 0 |
| Total | 170 | 684 | 793 | 0 | 1647 | 0 | 0 | 336 | 0 | 336 | 0 | 1692 | 133 | 0 | 1825 | 0 | 0 | 0 | 0 | 0 | 3808 | 0 |
| 16:00 | 49 | 347 | 209 | 0 | 605 | 0 | 0 | 87 | 0 | 87 | 0 | 465 | 19 | 0 | 484 | 0 | 0 | 0 | 0 | 0 | 1176 | 0 |
| 16:15 | 59 | 332 | 166 | 0 | 557 | 0 | 0 | 93 | 0 | 93 | 0 | 484 | 29 | 0 | 513 | 0 | 0 | 0 | 0 | 0 | 1163 | 0 |
| 16:30 | 45 | 365 | 191 | 0 | 601 | 0 | 0 | 119 | 0 | 119 | 0 | 484 | 19 | 0 | 503 | 0 | 0 | 0 | 0 | 0 | 1223 | 0 |
| 16:45 | 36 | 330 | 151 | 0 | 517 | 0 | 0 | 88 | 0 | 88 | 0 | 603 | 22 | 0 | 625 | 0 | 0 | 0 | 0 | 0 | 1230 | 0 |
| Total | 189 | 1374 | 717 | 0 | 2280 | 0 | 0 | 387 | 0 | 387 | 0 | 2036 | 89 | 0 | 2125 | 0 | 0 | 0 | 0 | 0 | 4792 | 0 |
| 17:00 | 58 | 355 | 198 | 0 | 611 | 0 | 0 | 114 | 0 | 114 | 0 | 488 | 28 | 0 | 516 | 0 | 0 | 0 | 0 | 0 | 1241 | 0 |
| 17:15 | 50 | 374 | 194 | 0 | 618 | 0 | 0 | 118 | 0 | 118 | 0 | 564 | 29 | 0 | 593 | 0 | 0 | 0 | 0 | 0 | 1329 | 0 |
| 17:30 | 55 | 341 | 185 | 0 | 581 | 0 | 0 | 100 | 0 | 100 | 0 | 590 | 26 | 0 | 616 | 0 | 0 | 0 | 0 | 0 | 1297 | 0 |
| 17:45 | 45 | 335 | 180 | 0 | 560 | 0 | 0 | 65 | 0 | 65 | 0 | 522 | 22 | 0 | 544 | 0 | 0 | 0 | 0 | 0 | 1169 | 0 |
| Total | 208 | 1405 | 757 | 0 | 2370 | 0 | 0 | 397 | 0 | 397 | 0 | 2164 | 105 | 0 | 2269 | 0 | 0 | 0 | 0 | 0 | 5036 | 0 |
| Grand Total | 704 | 4155 | 3265 | 0 | 8124 | 0 | 0 | 1374 | 0 | 1374 | 0 | 7094 | 446 | 0 | 7540 | 0 | 0 | 0 | 0 | 0 | 17038 | 0 |
| Apprch % | 8.7% | 51.1% | 40.2% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 94.1% | 5.9% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| Total % | 4.1% | 24.4% | 19.2% | 0.0% | 47.7% | 0.0% | 0.0% | 8.1% | 0.0% | 8.1% | 0.0% | 41.6% | 2.6% | 0.0% | 44.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | |

| **AM PEAK HOUR** | E Bidwell Street Southbound | | | | | Placerville Road Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Westbound On Ramp Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 07:45 | 43 | 177 | 250 | 0 | 470 | 0 | 0 | 86 | 0 | 86 | 0 | 443 | 44 | 0 | 487 | 0 | 0 | 0 | 0 | 0 | 1043 |
| 08:00 | 43 | 163 | 214 | 0 | 420 | 0 | 0 | 81 | 0 | 81 | 0 | 396 | 29 | 0 | 425 | 0 | 0 | 0 | 0 | 0 | 926 |
| 08:15 | 42 | 160 | 198 | 0 | 400 | 0 | 0 | 73 | 0 | 73 | 0 | 377 | 40 | 0 | 417 | 0 | 0 | 0 | 0 | 0 | 890 |
| 08:30 | 45 | 196 | 226 | 0 | 467 | 0 | 0 | 113 | 0 | 113 | 0 | 418 | 32 | 0 | 450 | 0 | 0 | 0 | 0 | 0 | 1030 |
| Total Volume | 173 | 696 | 888 | 0 | 1757 | 0 | 0 | 353 | 0 | 353 | 0 | 1634 | 145 | 0 | 1779 | 0 | 0 | 0 | 0 | 0 | 3889 |
| % App Total | 9.8% | 39.6% | 50.5% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 91.8% | 8.2% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | |
| PHF | .961 | .888 | .888 | .000 | .935 | .000 | .000 | .781 | .000 | .781 | .000 | .922 | .824 | .000 | .913 | .000 | .000 | .000 | .000 | .000 | .932 |

| **PM PEAK HOUR** | E Bidwell Street Southbound | | | | | Placerville Road Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Westbound On Ramp Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 36 | 330 | 151 | 0 | 517 | 0 | 0 | 88 | 0 | 88 | 0 | 603 | 22 | 0 | 625 | 0 | 0 | 0 | 0 | 0 | 1230 |
| 17:00 | 58 | 355 | 198 | 0 | 611 | 0 | 0 | 114 | 0 | 114 | 0 | 488 | 28 | 0 | 516 | 0 | 0 | 0 | 0 | 0 | 1241 |
| 17:15 | 50 | 374 | 194 | 0 | 618 | 0 | 0 | 118 | 0 | 118 | 0 | 564 | 29 | 0 | 593 | 0 | 0 | 0 | 0 | 0 | 1329 |
| 17:30 | 55 | 341 | 185 | 0 | 581 | 0 | 0 | 100 | 0 | 100 | 0 | 590 | 26 | 0 | 616 | 0 | 0 | 0 | 0 | 0 | 1297 |
| Total Volume | 199 | 1400 | 728 | 0 | 2327 | 0 | 0 | 420 | 0 | 420 | 0 | 2245 | 105 | 0 | 2350 | 0 | 0 | 0 | 0 | 0 | 5097 |
| % App Total | 8.6% | 60.2% | 31.3% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 95.5% | 4.5% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | |
| PHF | .858 | .936 | .919 | .000 | .941 | .000 | .000 | .890 | .000 | .890 | .000 | .931 | .905 | .000 | .940 | .000 | .000 | .000 | .000 | .000 | .959 |

# ALL TRAFFIC DATA

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7632-005 E Bidwell Street-US 50 Westbound Ramps.ppd
Date : 11/5/2013

**Unshifted Count = All Vehicles**

| | E Bidwell Street Southbound | | | | | US 50 Westbound Ramps Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Westbound Ramps Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 0 | 138 | 0 | 0 | 138 | 38 | 0 | 115 | 0 | 153 | 0 | 108 | 10 | 0 | 118 | 0 | 0 | 0 | 0 | 0 | 409 | 0 |
| 07:15 | 0 | 153 | 0 | 0 | 153 | 49 | 0 | 157 | 0 | 206 | 0 | 105 | 7 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 471 | 0 |
| 07:30 | 0 | 210 | 0 | 0 | 210 | 55 | 0 | 189 | 0 | 244 | 0 | 177 | 11 | 0 | 188 | 0 | 0 | 0 | 0 | 0 | 642 | 0 |
| 07:45 | 0 | 180 | 0 | 0 | 180 | 40 | 0 | 238 | 0 | 278 | 0 | 228 | 23 | 0 | 251 | 0 | 0 | 0 | 0 | 0 | 709 | 0 |
| Total | 0 | 681 | 0 | 0 | 681 | 182 | 0 | 699 | 0 | 881 | 0 | 618 | 51 | 0 | 669 | 0 | 0 | 0 | 0 | 0 | 2231 | 0 |
| 08:00 | 0 | 166 | 0 | 0 | 166 | 37 | 0 | 235 | 0 | 272 | 0 | 188 | 8 | 0 | 196 | 0 | 0 | 0 | 0 | 0 | 634 | 0 |
| 08:15 | 0 | 159 | 0 | 0 | 159 | 31 | 0 | 228 | 0 | 259 | 0 | 193 | 12 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 623 | 0 |
| 08:30 | 0 | 198 | 0 | 0 | 198 | 15 | 0 | 257 | 0 | 272 | 0 | 201 | 13 | 0 | 214 | 0 | 0 | 0 | 0 | 0 | 684 | 0 |
| 08:45 | 0 | 158 | 0 | 0 | 158 | 12 | 0 | 277 | 0 | 289 | 0 | 233 | 13 | 0 | 246 | 0 | 0 | 0 | 0 | 0 | 693 | 0 |
| Total | 0 | 681 | 0 | 0 | 681 | 95 | 0 | 997 | 0 | 1092 | 0 | 815 | 46 | 0 | 861 | 0 | 0 | 0 | 0 | 0 | 2634 | 0 |
| 16:00 | 0 | 334 | 0 | 0 | 334 | 12 | 0 | 190 | 0 | 202 | 0 | 275 | 16 | 0 | 291 | 0 | 0 | 0 | 0 | 0 | 827 | 0 |
| 16:15 | 0 | 350 | 0 | 0 | 350 | 11 | 0 | 206 | 0 | 217 | 0 | 300 | 26 | 0 | 326 | 0 | 0 | 0 | 0 | 0 | 893 | 0 |
| 16:30 | 0 | 345 | 0 | 0 | 345 | 15 | 0 | 209 | 0 | 224 | 0 | 311 | 37 | 0 | 348 | 0 | 0 | 0 | 0 | 0 | 917 | 0 |
| 16:45 | 0 | 349 | 0 | 0 | 349 | 13 | 0 | 243 | 0 | 256 | 0 | 358 | 34 | 0 | 392 | 0 | 0 | 0 | 0 | 0 | 997 | 0 |
| Total | 0 | 1378 | 0 | 0 | 1378 | 51 | 0 | 848 | 0 | 899 | 0 | 1244 | 113 | 0 | 1357 | 0 | 0 | 0 | 0 | 0 | 3634 | 0 |
| 17:00 | 0 | 346 | 0 | 0 | 346 | 16 | 0 | 216 | 0 | 232 | 0 | 326 | 28 | 0 | 354 | 0 | 0 | 0 | 0 | 0 | 932 | 0 |
| 17:15 | 0 | 385 | 0 | 0 | 385 | 17 | 0 | 267 | 0 | 284 | 0 | 324 | 28 | 0 | 352 | 0 | 0 | 0 | 0 | 0 | 1021 | 0 |
| 17:30 | 0 | 325 | 0 | 0 | 325 | 14 | 0 | 268 | 0 | 282 | 0 | 328 | 23 | 0 | 351 | 0 | 0 | 0 | 0 | 0 | 958 | 0 |
| 17:45 | 0 | 332 | 0 | 0 | 332 | 9 | 0 | 262 | 0 | 271 | 0 | 287 | 15 | 0 | 302 | 0 | 0 | 0 | 0 | 0 | 905 | 0 |
| Total | 0 | 1388 | 0 | 0 | 1388 | 56 | 0 | 1013 | 0 | 1069 | 0 | 1265 | 94 | 0 | 1359 | 0 | 0 | 0 | 0 | 0 | 3816 | 0 |
| Grand Total | 0 | 4128 | 0 | 0 | 4128 | 384 | 0 | 3557 | 0 | 3941 | 0 | 3942 | 304 | 0 | 4246 | 0 | 0 | 0 | 0 | 0 | 12315 | 0 |
| Apprch % | 0.0% | 100.0% | 0.0% | 0.0% | | 9.7% | 0.0% | 90.3% | 0.0% | | 0.0% | 92.8% | 7.2% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| Total % | 0.0% | 33.5% | 0.0% | 0.0% | 33.5% | 3.1% | 0.0% | 28.9% | 0.0% | 32.0% | 0.0% | 32.0% | 2.5% | 0.0% | 34.5% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | |

| AM PEAK HOUR | E Bidwell Street Southbound | | | | | US 50 Westbound Ramps Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Westbound Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 07:45 | 0 | 180 | 0 | 0 | 180 | 40 | 0 | 238 | 0 | 278 | 0 | 228 | 23 | 0 | 251 | 0 | 0 | 0 | 0 | 0 | 709 |
| 08:00 | 0 | 166 | 0 | 0 | 166 | 37 | 0 | 235 | 0 | 272 | 0 | 188 | 8 | 0 | 196 | 0 | 0 | 0 | 0 | 0 | 634 |
| 08:15 | 0 | 159 | 0 | 0 | 159 | 31 | 0 | 228 | 0 | 259 | 0 | 193 | 12 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 623 |
| 08:30 | 0 | 198 | 0 | 0 | 198 | 15 | 0 | 257 | 0 | 272 | 0 | 201 | 13 | 0 | 214 | 0 | 0 | 0 | 0 | 0 | 684 |
| Total Volume | 0 | 703 | 0 | 0 | 703 | 123 | 0 | 958 | 0 | 1081 | 0 | 810 | 56 | 0 | 866 | 0 | 0 | 0 | 0 | 0 | 2650 |
| % App Total | 0.0% | 100.0% | 0.0% | 0.0% | | 11.4% | 0.0% | 88.6% | 0.0% | | 0.0% | 93.5% | 6.5% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | |
| PHF | .000 | .888 | .000 | .000 | .888 | .769 | .000 | .932 | .000 | .972 | .000 | .888 | .609 | .000 | .863 | .000 | .000 | .000 | .000 | .000 | .934 |

| PM PEAK HOUR | E Bidwell Street Southbound | | | | | US 50 Westbound Ramps Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Westbound Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 0 | 349 | 0 | 0 | 349 | 13 | 0 | 243 | 0 | 256 | 0 | 358 | 34 | 0 | 392 | 0 | 0 | 0 | 0 | 0 | 997 |
| 17:00 | 0 | 346 | 0 | 0 | 346 | 16 | 0 | 216 | 0 | 232 | 0 | 326 | 28 | 0 | 354 | 0 | 0 | 0 | 0 | 0 | 932 |
| 17:15 | 0 | 385 | 0 | 0 | 385 | 17 | 0 | 267 | 0 | 284 | 0 | 324 | 28 | 0 | 352 | 0 | 0 | 0 | 0 | 0 | 1021 |
| 17:30 | 0 | 325 | 0 | 0 | 325 | 14 | 0 | 268 | 0 | 282 | 0 | 328 | 23 | 0 | 351 | 0 | 0 | 0 | 0 | 0 | 958 |
| Total Volume | 0 | 1405 | 0 | 0 | 1405 | 60 | 0 | 994 | 0 | 1054 | 0 | 1336 | 113 | 0 | 1449 | 0 | 0 | 0 | 0 | 0 | 3908 |
| % App Total | 0.0% | 100.0% | 0.0% | 0.0% | | 5.7% | 0.0% | 94.3% | 0.0% | | 0.0% | 92.2% | 7.8% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | |
| PHF | .000 | .912 | .000 | .000 | .912 | .882 | .000 | .927 | .000 | .928 | .000 | .933 | .831 | .000 | .924 | .000 | .000 | .000 | .000 | .000 | .957 |

# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 13-7632-006 E Bidwell Street-US 50 Eastbound Ramps.ppd
Date : 11/5/2013

**Unshifted Count = All Vehicles**

| | E Bidwell Street Southbound | | | | | US 50 Eastbound Ramps Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Eastbound Ramps Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 0 | 75 | 99 | 0 | 174 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 10 | 0 | 38 | 81 | 0 | 7 | 0 | 88 | 300 | 0 |
| 07:15 | 0 | 100 | 105 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 13 | 0 | 32 | 98 | 0 | 12 | 0 | 110 | 347 | 0 |
| 07:30 | 0 | 95 | 165 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 22 | 0 | 79 | 125 | 0 | 5 | 0 | 130 | 469 | 0 |
| 07:45 | 0 | 91 | 136 | 0 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 22 | 0 | 82 | 197 | 0 | 9 | 0 | 206 | 515 | 0 |
| Total | 0 | 361 | 505 | 0 | 866 | 0 | 0 | 0 | 0 | 0 | 0 | 164 | 67 | 0 | 231 | 501 | 0 | 33 | 0 | 534 | 1631 | 0 |
| 08:00 | 0 | 69 | 128 | 0 | 197 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 30 | 0 | 72 | 149 | 0 | 8 | 0 | 157 | 426 | 0 |
| 08:15 | 0 | 64 | 128 | 0 | 192 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 31 | 0 | 76 | 165 | 0 | 11 | 0 | 176 | 444 | 0 |
| 08:30 | 0 | 49 | 152 | 0 | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 29 | 0 | 87 | 156 | 0 | 10 | 0 | 166 | 454 | 0 |
| 08:45 | 0 | 39 | 139 | 0 | 178 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 27 | 0 | 76 | 194 | 0 | 10 | 0 | 204 | 458 | 0 |
| Total | 0 | 221 | 547 | 0 | 768 | 0 | 0 | 0 | 0 | 0 | 0 | 194 | 117 | 0 | 311 | 664 | 0 | 39 | 0 | 703 | 1782 | 0 |
| 16:00 | 0 | 72 | 269 | 0 | 341 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 28 | 0 | 74 | 257 | 0 | 9 | 0 | 266 | 681 | 0 |
| 16:15 | 0 | 74 | 280 | 0 | 354 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 45 | 0 | 108 | 257 | 0 | 8 | 0 | 265 | 727 | 0 |
| 16:30 | 0 | 86 | 285 | 0 | 371 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 44 | 0 | 116 | 292 | 0 | 12 | 0 | 304 | 791 | 0 |
| 16:45 | 0 | 63 | 296 | 0 | 359 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 44 | 0 | 123 | 301 | 0 | 13 | 0 | 314 | 796 | 0 |
| Total | 0 | 295 | 1130 | 0 | 1425 | 0 | 0 | 0 | 0 | 0 | 0 | 260 | 161 | 0 | 421 | 1107 | 0 | 42 | 0 | 1149 | 2995 | 0 |
| 17:00 | 0 | 76 | 305 | 0 | 381 | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 45 | 0 | 137 | 268 | 0 | 10 | 0 | 278 | 796 | 0 |
| 17:15 | 0 | 81 | 304 | 0 | 385 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 35 | 0 | 126 | 247 | 0 | 13 | 0 | 260 | 771 | 0 |
| 17:30 | 0 | 60 | 286 | 0 | 346 | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 51 | 0 | 137 | 262 | 0 | 17 | 0 | 279 | 762 | 0 |
| 17:45 | 0 | 48 | 275 | 0 | 323 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 47 | 0 | 101 | 263 | 0 | 11 | 0 | 274 | 698 | 0 |
| Total | 0 | 265 | 1170 | 0 | 1435 | 0 | 0 | 0 | 0 | 0 | 0 | 323 | 178 | 0 | 501 | 1040 | 0 | 51 | 0 | 1091 | 3027 | 0 |
| Grand Total | 0 | 1142 | 3352 | 0 | 4494 | 0 | 0 | 0 | 0 | 0 | 0 | 941 | 523 | 0 | 1464 | 3312 | 0 | 165 | 0 | 3477 | 9435 | 0 |
| Apprch % | 0.0% | 25.4% | 74.6% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 64.3% | 35.7% | 0.0% | | 95.3% | 0.0% | 4.7% | 0.0% | | | |
| Total % | 0.0% | 12.1% | 35.5% | 0.0% | 47.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 10.0% | 5.5% | 0.0% | 15.5% | 35.1% | 0.0% | 1.7% | 0.0% | 36.9% | 100.0% | |

| **AM PEAK HOUR** | E Bidwell Street Southbound | | | | | US 50 Eastbound Ramps Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Eastbound Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 07:30 | 0 | 95 | 165 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 22 | 0 | 79 | 125 | 0 | 5 | 0 | 130 | 469 |
| 07:45 | 0 | 91 | 136 | 0 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 22 | 0 | 82 | 197 | 0 | 9 | 0 | 206 | 515 |
| 08:00 | 0 | 69 | 128 | 0 | 197 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 30 | 0 | 72 | 149 | 0 | 8 | 0 | 157 | 426 |
| 08:15 | 0 | 64 | 128 | 0 | 192 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 31 | 0 | 76 | 165 | 0 | 11 | 0 | 176 | 444 |
| Total Volume | 0 | 319 | 557 | 0 | 876 | 0 | 0 | 0 | 0 | 0 | 0 | 204 | 105 | 0 | 309 | 636 | 0 | 33 | 0 | 669 | 1854 |
| % App Total | 0.0% | 36.4% | 63.6% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 66.0% | 34.0% | 0.0% | | 95.1% | 0.0% | 4.9% | 0.0% | | |
| PHF | .000 | .839 | .844 | .000 | .842 | .000 | .000 | .000 | .000 | .000 | .000 | .850 | .847 | .000 | .942 | .807 | .000 | .750 | .000 | .812 | .900 |

| **PM PEAK HOUR** | E Bidwell Street Southbound | | | | | US 50 Eastbound Ramps Westbound | | | | | E Bidwell Street Northbound | | | | | US 50 Eastbound Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:30 to 17:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:30 | | | | | | | | | | | | | | | | | | | | | |
| 16:30 | 0 | 86 | 285 | 0 | 371 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 44 | 0 | 116 | 292 | 0 | 12 | 0 | 304 | 791 |
| 16:45 | 0 | 63 | 296 | 0 | 359 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 44 | 0 | 123 | 301 | 0 | 13 | 0 | 314 | 796 |
| 17:00 | 0 | 76 | 305 | 0 | 381 | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 45 | 0 | 137 | 268 | 0 | 10 | 0 | 278 | 796 |
| 17:15 | 0 | 81 | 304 | 0 | 385 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 35 | 0 | 126 | 247 | 0 | 13 | 0 | 260 | 771 |
| Total Volume | 0 | 306 | 1190 | 0 | 1496 | 0 | 0 | 0 | 0 | 0 | 0 | 334 | 168 | 0 | 502 | 1108 | 0 | 48 | 0 | 1156 | 3154 |
| % App Total | 0.0% | 20.5% | 79.5% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 66.5% | 33.5% | 0.0% | | 95.8% | 0.0% | 4.2% | 0.0% | | |
| PHF | .000 | .890 | .975 | .000 | .971 | .000 | .000 | .000 | .000 | .000 | .000 | .908 | .933 | .000 | .916 | .920 | .000 | .923 | .000 | .920 | .991 |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-007 El Dorado Hills Boulevard-US 50 WB Ramps.
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| | El Dorado Hills Boulevard Southbound | | | | | Saratoga Way Westbound | | | | | Latrobe Road Northbound | | | | | US 50 WB Ramps Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 5 | 110 | 250 | 0 | 365 | 15 | 18 | 11 | 0 | 44 | 86 | 112 | 23 | 0 | 221 | 35 | 17 | 99 | 0 | 151 | 781 | 0 |
| 07:15 | 10 | 153 | 246 | 0 | 409 | 17 | 36 | 9 | 0 | 62 | 92 | 93 | 20 | 0 | 205 | 33 | 20 | 160 | 0 | 213 | 889 | 0 |
| 07:30 | 11 | 199 | 264 | 0 | 474 | 16 | 25 | 11 | 0 | 52 | 109 | 102 | 26 | 0 | 237 | 38 | 9 | 164 | 0 | 211 | 974 | 0 |
| 07:45 | 13 | 234 | 264 | 0 | 511 | 21 | 31 | 13 | 0 | 65 | 94 | 126 | 23 | 0 | 243 | 51 | 20 | 205 | 0 | 276 | 1095 | 0 |
| Total | 39 | 696 | 1024 | 0 | 1759 | 69 | 110 | 44 | 0 | 223 | 381 | 433 | 92 | 0 | 906 | 157 | 66 | 628 | 0 | 851 | 3739 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 08:00 | 12 | 228 | 235 | 0 | 475 | 28 | 29 | 11 | 0 | 68 | 138 | 115 | 34 | 0 | 287 | 30 | 20 | 166 | 0 | 216 | 1046 | 0 |
| 08:15 | 13 | 164 | 200 | 0 | 377 | 24 | 28 | 8 | 0 | 60 | 120 | 153 | 25 | 0 | 298 | 34 | 12 | 160 | 0 | 206 | 941 | 0 |
| 08:30 | 16 | 133 | 197 | 0 | 346 | 19 | 30 | 8 | 0 | 57 | 116 | 121 | 22 | 0 | 259 | 39 | 12 | 115 | 0 | 166 | 828 | 0 |
| 08:45 | 8 | 182 | 175 | 0 | 365 | 20 | 22 | 3 | 0 | 45 | 106 | 184 | 37 | 0 | 327 | 43 | 11 | 107 | 0 | 161 | 898 | 0 |
| Total | 49 | 707 | 807 | 0 | 1563 | 91 | 109 | 30 | 0 | 230 | 480 | 573 | 118 | 0 | 1171 | 146 | 55 | 548 | 0 | 749 | 3713 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 16:00 | 10 | 114 | 83 | 0 | 207 | 30 | 23 | 18 | 0 | 71 | 275 | 296 | 57 | 0 | 628 | 34 | 11 | 65 | 0 | 110 | 1016 | 0 |
| 16:15 | 15 | 130 | 112 | 0 | 257 | 33 | 22 | 21 | 0 | 76 | 228 | 334 | 52 | 0 | 614 | 41 | 19 | 71 | 0 | 131 | 1078 | 0 |
| 16:30 | 13 | 145 | 103 | 0 | 261 | 38 | 13 | 21 | 0 | 72 | 262 | 319 | 73 | 0 | 654 | 27 | 15 | 72 | 0 | 114 | 1101 | 0 |
| 16:45 | 16 | 135 | 102 | 0 | 253 | 45 | 20 | 26 | 0 | 91 | 260 | 326 | 83 | 0 | 669 | 41 | 14 | 80 | 0 | 135 | 1148 | 0 |
| Total | 54 | 524 | 400 | 0 | 978 | 146 | 78 | 86 | 0 | 310 | 1025 | 1275 | 265 | 0 | 2565 | 143 | 59 | 288 | 0 | 490 | 4343 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 10 | 117 | 109 | 0 | 236 | 42 | 22 | 23 | 0 | 87 | 273 | 316 | 77 | 0 | 666 | 40 | 16 | 79 | 0 | 135 | 1124 | 0 |
| 17:15 | 13 | 112 | 88 | 0 | 213 | 22 | 17 | 23 | 0 | 62 | 278 | 352 | 77 | 0 | 707 | 42 | 13 | 82 | 0 | 137 | 1119 | 0 |
| 17:30 | 13 | 123 | 98 | 0 | 234 | 32 | 25 | 21 | 0 | 78 | 238 | 366 | 67 | 0 | 671 | 44 | 10 | 80 | 0 | 134 | 1117 | 0 |
| 17:45 | 12 | 126 | 106 | 0 | 244 | 33 | 20 | 22 | 0 | 75 | 171 | 314 | 64 | 0 | 549 | 49 | 18 | 102 | 0 | 169 | 1037 | 0 |
| Total | 48 | 478 | 401 | 0 | 927 | 129 | 84 | 89 | 0 | 302 | 960 | 1348 | 285 | 0 | 2593 | 175 | 57 | 343 | 0 | 575 | 4397 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | |
| Grand Total | 190 | 2405 | 2632 | 0 | 5227 | 435 | 381 | 249 | 0 | 1065 | 2846 | 3629 | 760 | 0 | 7235 | 621 | 237 | 1807 | 0 | 2665 | 16192 | 0 |
| Apprch % | 3.6% | 46.0% | 50.4% | 0.0% | | 40.8% | 35.8% | 23.4% | 0.0% | | 39.3% | 50.2% | 10.5% | 0.0% | | 23.3% | 8.9% | 67.8% | 0.0% | | | |
| Total % | 1.2% | 14.9% | 16.3% | 0.0% | 32.3% | 2.7% | 2.4% | 1.5% | 0.0% | 6.6% | 17.6% | 22.4% | 4.7% | 0.0% | 44.7% | 3.8% | 1.5% | 11.2% | 0.0% | 16.5% | 100.0% | |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-007 El Dorado Hills Boulevard-US 50 WB Ramps.
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | El Dorado Hills Boulevard Southbound | | | | | Saratoga Way Westbound | | | | | Latrobe Road Northbound | | | | | US 50 WB Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 07:30 | 11 | 199 | 264 | 0 | 474 | 16 | 25 | 11 | 0 | 52 | 109 | 102 | 26 | 0 | 237 | 38 | 9 | 164 | 0 | 211 | 974 |
| 07:45 | 13 | 234 | 264 | 0 | 511 | 21 | 31 | 13 | 0 | 65 | 94 | 126 | 23 | 0 | 243 | 51 | 20 | 205 | 0 | 276 | 1095 |
| 08:00 | 12 | 228 | 235 | 0 | 475 | 28 | 29 | 11 | 0 | 68 | 138 | 115 | 34 | 0 | 287 | 30 | 20 | 166 | 0 | 216 | 1046 |
| 08:15 | 13 | 164 | 200 | 0 | 377 | 24 | 28 | 8 | 0 | 60 | 120 | 153 | 25 | 0 | 298 | 34 | 12 | 160 | 0 | 206 | 941 |
| Total Volume | 49 | 825 | 963 | 0 | 1837 | 89 | 113 | 43 | 0 | 245 | 461 | 496 | 108 | 0 | 1065 | 153 | 61 | 695 | 0 | 909 | 4056 |
| % App Total | 2.7% | 44.9% | 52.4% | 0.0% | | 36.3% | 46.1% | 17.6% | 0.0% | | 43.3% | 46.6% | 10.1% | 0.0% | | 16.8% | 6.7% | 76.5% | 0.0% | | |
| PHF | .942 | .881 | .912 | .000 | .899 | .795 | .911 | .827 | .000 | .901 | .835 | .810 | .794 | .000 | .893 | .750 | .763 | .848 | .000 | .823 | .926 |

| **PM PEAK HOUR** | El Dorado Hills Boulevard Southbound | | | | | Saratoga Way Westbound | | | | | Latrobe Road Northbound | | | | | US 50 WB Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 16 | 135 | 102 | 0 | 253 | 45 | 20 | 26 | 0 | 91 | 260 | 326 | 83 | 0 | 669 | 41 | 14 | 80 | 0 | 135 | 1148 |
| 17:00 | 10 | 117 | 109 | 0 | 236 | 42 | 22 | 23 | 0 | 87 | 273 | 316 | 77 | 0 | 666 | 40 | 16 | 79 | 0 | 135 | 1124 |
| 17:15 | 13 | 112 | 88 | 0 | 213 | 22 | 17 | 23 | 0 | 62 | 278 | 352 | 77 | 0 | 707 | 42 | 13 | 82 | 0 | 137 | 1119 |
| 17:30 | 13 | 123 | 98 | 0 | 234 | 32 | 25 | 21 | 0 | 78 | 238 | 366 | 67 | 0 | 671 | 44 | 10 | 80 | 0 | 134 | 1117 |
| Total Volume | 52 | 487 | 397 | 0 | 936 | 141 | 84 | 93 | 0 | 318 | 1049 | 1360 | 304 | 0 | 2713 | 167 | 53 | 321 | 0 | 541 | 4508 |
| % App Total | 5.6% | 52.0% | 42.4% | 0.0% | | 44.3% | 26.4% | 29.2% | 0.0% | | 38.7% | 50.1% | 11.2% | 0.0% | | 30.9% | 9.8% | 59.3% | 0.0% | | |
| PHF | .813 | .902 | .911 | .000 | .925 | .783 | .840 | .894 | .000 | .874 | .943 | .929 | .916 | .000 | .959 | .949 | .828 | .979 | .000 | .987 | .982 |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-008 Latrobe Road-US 50 EB Ramps.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| | Latrobe Road Southbound | | | | | US 50 EB Off-Ramp Westbound | | | | | Latrobe Road Northbound | | | | | US 50 EB Ramps Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 21 | 195 | 0 | 0 | 216 | 0 | 0 | 65 | 0 | 65 | 0 | 167 | 47 | 0 | 214 | 0 | 0 | 200 | 0 | 200 | 695 | 0 |
| 07:15 | 53 | 289 | 0 | 0 | 342 | 0 | 0 | 63 | 0 | 63 | 0 | 136 | 46 | 0 | 182 | 0 | 0 | 229 | 0 | 229 | 816 | 0 |
| 07:30 | 65 | 308 | 0 | 0 | 373 | 0 | 0 | 76 | 0 | 76 | 0 | 157 | 65 | 0 | 222 | 0 | 0 | 227 | 0 | 227 | 898 | 0 |
| 07:45 | 77 | 390 | 0 | 0 | 467 | 0 | 0 | 93 | 0 | 93 | 0 | 165 | 51 | 0 | 216 | 0 | 0 | 226 | 0 | 226 | 1002 | 0 |
| Total | 216 | 1182 | 0 | 0 | 1398 | 0 | 0 | 297 | 0 | 297 | 0 | 625 | 209 | 0 | 834 | 0 | 0 | 882 | 0 | 882 | 3411 | 0 |
| 08:00 | 80 | 332 | 0 | 2 | 414 | 0 | 0 | 81 | 0 | 81 | 0 | 201 | 67 | 0 | 268 | 0 | 0 | 298 | 0 | 298 | 1061 | 2 |
| 08:15 | 38 | 324 | 0 | 0 | 362 | 0 | 0 | 89 | 0 | 89 | 0 | 208 | 60 | 0 | 268 | 0 | 0 | 275 | 0 | 275 | 994 | 0 |
| 08:30 | 34 | 227 | 0 | 0 | 261 | 0 | 0 | 78 | 0 | 78 | 0 | 203 | 59 | 0 | 262 | 0 | 0 | 262 | 0 | 262 | 863 | 0 |
| 08:45 | 57 | 263 | 0 | 0 | 320 | 0 | 0 | 103 | 0 | 103 | 0 | 200 | 46 | 0 | 246 | 0 | 0 | 277 | 0 | 277 | 946 | 0 |
| Total | 209 | 1146 | 0 | 2 | 1357 | 0 | 0 | 351 | 0 | 351 | 0 | 812 | 232 | 0 | 1044 | 0 | 0 | 1112 | 0 | 1112 | 3864 | 2 |
| 16:00 | 45 | 174 | 0 | 0 | 219 | 0 | 0 | 192 | 0 | 192 | 0 | 417 | 191 | 0 | 608 | 0 | 0 | 207 | 0 | 207 | 1226 | 0 |
| 16:15 | 48 | 190 | 0 | 0 | 238 | 0 | 0 | 213 | 0 | 213 | 0 | 376 | 136 | 0 | 512 | 0 | 0 | 164 | 0 | 164 | 1127 | 0 |
| 16:30 | 54 | 191 | 0 | 1 | 246 | 0 | 0 | 246 | 0 | 246 | 0 | 450 | 185 | 0 | 635 | 0 | 0 | 169 | 0 | 169 | 1296 | 1 |
| 16:45 | 52 | 218 | 0 | 0 | 270 | 0 | 0 | 215 | 0 | 215 | 0 | 421 | 182 | 0 | 603 | 0 | 0 | 189 | 0 | 189 | 1277 | 0 |
| Total | 199 | 773 | 0 | 1 | 973 | 0 | 0 | 866 | 0 | 866 | 0 | 1664 | 694 | 0 | 2358 | 0 | 0 | 729 | 0 | 729 | 4926 | 1 |
| 17:00 | 49 | 199 | 0 | 0 | 248 | 0 | 0 | 228 | 0 | 228 | 0 | 486 | 170 | 0 | 656 | 0 | 0 | 198 | 0 | 198 | 1330 | 0 |
| 17:15 | 51 | 159 | 0 | 0 | 210 | 0 | 0 | 237 | 0 | 237 | 0 | 438 | 193 | 0 | 631 | 0 | 0 | 246 | 0 | 246 | 1324 | 0 |
| 17:30 | 47 | 193 | 0 | 0 | 240 | 0 | 0 | 253 | 0 | 253 | 0 | 401 | 156 | 0 | 557 | 0 | 0 | 200 | 0 | 200 | 1250 | 0 |
| 17:45 | 38 | 212 | 0 | 1 | 251 | 0 | 0 | 250 | 0 | 250 | 0 | 307 | 137 | 0 | 444 | 0 | 0 | 215 | 0 | 215 | 1160 | 1 |
| Total | 185 | 763 | 0 | 1 | 949 | 0 | 0 | 968 | 0 | 968 | 0 | 1632 | 656 | 0 | 2288 | 0 | 0 | 859 | 0 | 859 | 5064 | 1 |
| Grand Total | 809 | 3864 | 0 | 4 | 4677 | 0 | 0 | 2482 | 0 | 2482 | 0 | 4733 | 1791 | 0 | 6524 | 0 | 0 | 3582 | 0 | 3582 | 17265 | 4 |
| Apprch % | 17.3% | 82.6% | 0.0% | 0.1% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 72.5% | 27.5% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | | |
| Total % | 4.7% | 22.4% | 0.0% | 0.0% | 27.1% | 0.0% | 0.0% | 14.4% | 0.0% | 14.4% | 0.0% | 27.4% | 10.4% | 0.0% | 37.8% | 0.0% | 0.0% | 20.7% | 0.0% | 20.7% | 100.0% | |

# ALL TRAFFIC DATA

City of Folsom
(916) 771-8700
orders@atdtraffic.com

All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-008 Latrobe Road-US 50 EB Ramps.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Latrobe Road Southbound | | | | | US 50 EB Off-Ramp Westbound | | | | | Latrobe Road Northbound | | | | | US 50 EB Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 07:30 | 65 | 308 | 0 | 0 | 373 | 0 | 0 | 76 | 0 | 76 | 0 | 157 | 65 | 0 | 222 | 0 | 0 | 227 | 0 | 227 | 898 |
| 07:45 | 77 | 390 | 0 | 0 | 467 | 0 | 0 | 93 | 0 | 93 | 0 | 165 | 51 | 0 | 216 | 0 | 0 | 226 | 0 | 226 | 1002 |
| 08:00 | 80 | 332 | 0 | 2 | 414 | 0 | 0 | 81 | 0 | 81 | 0 | 201 | 67 | 0 | 268 | 0 | 0 | 298 | 0 | 298 | 1061 |
| 08:15 | 38 | 324 | 0 | 0 | 362 | 0 | 0 | 89 | 0 | 89 | 0 | 208 | 60 | 0 | 268 | 0 | 0 | 275 | 0 | 275 | 994 |
| Total Volume | 260 | 1354 | 0 | 2 | 1616 | 0 | 0 | 339 | 0 | 339 | 0 | 731 | 243 | 0 | 974 | 0 | 0 | 1026 | 0 | 1026 | 3955 |
| % App Total | 16.1% | 83.8% | 0.0% | 0.1% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 75.1% | 24.9% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | |
| PHF | .813 | .868 | .000 | .250 | .865 | .000 | .000 | .911 | .000 | .911 | .000 | .879 | .907 | .000 | .909 | .000 | .000 | .861 | .000 | .861 | .932 |

| **PM PEAK HOUR** | Latrobe Road Southbound | | | | | US 50 EB Off-Ramp Westbound | | | | | Latrobe Road Northbound | | | | | US 50 EB Ramps Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:30 to 17:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:30 | | | | | | | | | | | | | | | | | | | | | |
| 16:30 | 54 | 191 | 0 | 1 | 246 | 0 | 0 | 246 | 0 | 246 | 0 | 450 | 185 | 0 | 635 | 0 | 0 | 169 | 0 | 169 | 1296 |
| 16:45 | 52 | 218 | 0 | 0 | 270 | 0 | 0 | 215 | 0 | 215 | 0 | 421 | 182 | 0 | 603 | 0 | 0 | 189 | 0 | 189 | 1277 |
| 17:00 | 49 | 199 | 0 | 0 | 248 | 0 | 0 | 228 | 0 | 228 | 0 | 486 | 170 | 0 | 656 | 0 | 0 | 198 | 0 | 198 | 1330 |
| 17:15 | 51 | 159 | 0 | 0 | 210 | 0 | 0 | 237 | 0 | 237 | 0 | 438 | 193 | 0 | 631 | 0 | 0 | 246 | 0 | 246 | 1324 |
| Total Volume | 206 | 767 | 0 | 1 | 974 | 0 | 0 | 926 | 0 | 926 | 0 | 1795 | 730 | 0 | 2525 | 0 | 0 | 802 | 0 | 802 | 5227 |
| % App Total | 21.1% | 78.7% | 0.0% | 0.1% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 71.1% | 28.9% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | |
| PHF | .954 | .880 | .000 | .250 | .902 | .000 | .000 | .941 | .000 | .941 | .000 | .923 | .946 | .000 | .962 | .000 | .000 | .815 | .000 | .815 | .983 |

# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Rancho Cordova
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7317-006 Scott Road East-White Rock Road.ppd
Date : 5/8/2014

**Unshifted Count = All Vehicles**

| | Scott Road East Southbound | | | | | White Rock Road Westbound | | | | | Driveway Northbound | | | | | White Rock Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 18 | 0 | 64 | 0 | 82 | 0 | 45 | 9 | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 28 | 32 | 0 | 0 | 60 | 196 | 0 |
| 07:15 | 14 | 0 | 55 | 0 | 69 | 0 | 91 | 11 | 0 | 102 | 0 | 0 | 0 | 0 | 0 | 31 | 48 | 0 | 0 | 79 | 250 | 0 |
| 07:30 | 19 | 0 | 70 | 0 | 89 | 0 | 114 | 15 | 0 | 129 | 0 | 0 | 0 | 0 | 0 | 46 | 39 | 0 | 0 | 85 | 303 | 0 |
| 07:45 | 19 | 0 | 76 | 0 | 95 | 0 | 130 | 23 | 0 | 153 | 0 | 0 | 0 | 0 | 0 | 64 | 50 | 0 | 0 | 114 | 362 | 0 |
| Total | 70 | 0 | 265 | 0 | 335 | 0 | 380 | 58 | 0 | 438 | 0 | 0 | 0 | 0 | 0 | 169 | 169 | 0 | 0 | 338 | 1111 | 0 |
| 08:00 | 15 | 0 | 66 | 0 | 81 | 0 | 71 | 17 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 48 | 44 | 0 | 0 | 92 | 261 | 0 |
| 08:15 | 18 | 0 | 66 | 0 | 84 | 0 | 76 | 8 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 44 | 50 | 0 | 0 | 94 | 262 | 0 |
| 08:30 | 8 | 0 | 50 | 0 | 58 | 0 | 43 | 7 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 61 | 46 | 0 | 0 | 107 | 215 | 0 |
| 08:45 | 12 | 0 | 29 | 0 | 41 | 0 | 33 | 11 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 54 | 37 | 0 | 0 | 91 | 176 | 0 |
| Total | 53 | 0 | 211 | 0 | 264 | 0 | 223 | 43 | 0 | 266 | 0 | 0 | 0 | 0 | 0 | 207 | 177 | 0 | 0 | 384 | 914 | 0 |
| 16:00 | 28 | 1 | 48 | 0 | 77 | 1 | 65 | 16 | 0 | 82 | 0 | 0 | 0 | 0 | 0 | 75 | 33 | 0 | 0 | 108 | 267 | 0 |
| 16:15 | 38 | 0 | 51 | 0 | 89 | 0 | 42 | 20 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 92 | 50 | 1 | 0 | 143 | 294 | 0 |
| 16:30 | 27 | 0 | 64 | 0 | 91 | 0 | 60 | 34 | 0 | 94 | 0 | 0 | 0 | 0 | 0 | 105 | 50 | 0 | 0 | 155 | 340 | 0 |
| 16:45 | 35 | 1 | 53 | 0 | 89 | 0 | 53 | 20 | 0 | 73 | 0 | 1 | 0 | 0 | 1 | 139 | 60 | 0 | 0 | 199 | 362 | 0 |
| Total | 128 | 2 | 216 | 0 | 346 | 1 | 220 | 90 | 0 | 311 | 0 | 1 | 0 | 0 | 1 | 411 | 193 | 1 | 0 | 605 | 1263 | 0 |
| 17:00 | 31 | 1 | 42 | 0 | 74 | 0 | 70 | 22 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 93 | 63 | 1 | 0 | 157 | 323 | 0 |
| 17:15 | 41 | 0 | 45 | 0 | 86 | 0 | 72 | 32 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 127 | 65 | 0 | 0 | 192 | 382 | 0 |
| 17:30 | 27 | 0 | 47 | 0 | 74 | 0 | 41 | 20 | 0 | 61 | 0 | 2 | 0 | 0 | 2 | 103 | 73 | 1 | 0 | 177 | 314 | 0 |
| 17:45 | 31 | 0 | 40 | 0 | 71 | 0 | 30 | 14 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 91 | 55 | 1 | 0 | 147 | 262 | 0 |
| Total | 130 | 1 | 174 | 0 | 305 | 0 | 213 | 88 | 0 | 301 | 0 | 2 | 0 | 0 | 2 | 414 | 256 | 3 | 0 | 673 | 1281 | 0 |
| Grand Total | 381 | 3 | 866 | 0 | 1250 | 1 | 1036 | 279 | 0 | 1316 | 0 | 3 | 0 | 0 | 3 | 1201 | 795 | 4 | 0 | 2000 | 4569 | 0 |
| Apprch % | 30.5% | 0.2% | 69.3% | 0.0% | | 0.1% | 78.7% | 21.2% | 0.0% | | 0.0% | 100.0% | 0.0% | 0.0% | | 60.1% | 39.8% | 0.2% | 0.0% | | | |
| Total % | 8.3% | 0.1% | 19.0% | 0.0% | 27.4% | 0.0% | 22.7% | 6.1% | 0.0% | 28.8% | 0.0% | 0.1% | 0.0% | 0.0% | 0.1% | 26.3% | 17.4% | 0.1% | 0.0% | 43.8% | 100.0% | |

# ALL TRAFFIC DATA

City of Rancho Cordova
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 14-7317-006 Scott Road East-White Rock Road.ppd
Date : 5/8/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Scott Road East Southbound | | | | | White Rock Road Westbound | | | | | Driveway Northbound | | | | | White Rock Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 07:30 | 19 | 0 | 70 | 0 | 89 | 0 | 114 | 15 | 0 | 129 | 0 | 0 | 0 | 0 | 0 | 46 | 39 | 0 | 0 | 85 | 303 |
| 07:45 | 19 | 0 | 76 | 0 | 95 | 0 | 130 | 23 | 0 | 153 | 0 | 0 | 0 | 0 | 0 | 64 | 50 | 0 | 0 | 114 | 362 |
| 08:00 | 15 | 0 | 66 | 0 | 81 | 0 | 71 | 17 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 48 | 44 | 0 | 0 | 92 | 261 |
| 08:15 | 18 | 0 | 66 | 0 | 84 | 0 | 76 | 8 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 44 | 50 | 0 | 0 | 94 | 262 |
| Total Volume | 71 | 0 | 278 | 0 | 349 | 0 | 391 | 63 | 0 | 454 | 0 | 0 | 0 | 0 | 0 | 202 | 183 | 0 | 0 | 385 | 1188 |
| % App Total | 20.3% | 0.0% | 79.7% | 0.0% | | 0.0% | 86.1% | 13.9% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 52.5% | 47.5% | 0.0% | 0.0% | | |
| PHF | .934 | .000 | .914 | .000 | .918 | .000 | .752 | .685 | .000 | .742 | .000 | .000 | .000 | .000 | .000 | .789 | .915 | .000 | .000 | .844 | .820 |

| **PM PEAK HOUR** | Scott Road East Southbound | | | | | White Rock Road Westbound | | | | | Driveway Northbound | | | | | White Rock Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:30 to 17:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:30 | | | | | | | | | | | | | | | | | | | | | |
| 16:30 | 27 | 0 | 64 | 0 | 91 | 0 | 60 | 34 | 0 | 94 | 0 | 0 | 0 | 0 | 0 | 105 | 50 | 0 | 0 | 155 | 340 |
| 16:45 | 35 | 1 | 53 | 0 | 89 | 0 | 53 | 20 | 0 | 73 | 0 | 1 | 0 | 0 | 1 | 139 | 60 | 0 | 0 | 199 | 362 |
| 17:00 | 31 | 1 | 42 | 0 | 74 | 0 | 70 | 22 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 93 | 63 | 1 | 0 | 157 | 323 |
| 17:15 | 41 | 0 | 45 | 0 | 86 | 0 | 72 | 32 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 127 | 65 | 0 | 0 | 192 | 382 |
| Total Volume | 134 | 2 | 204 | 0 | 340 | 0 | 255 | 108 | 0 | 363 | 0 | 1 | 0 | 0 | 1 | 464 | 238 | 1 | 0 | 703 | 1407 |
| % App Total | 39.4% | 0.6% | 60.0% | 0.0% | | 0.0% | 70.2% | 29.8% | 0.0% | | 0.0% | 100.0% | 0.0% | 0.0% | | 66.0% | 33.9% | 0.1% | 0.0% | | |
| PHF | .817 | .500 | .797 | .000 | .934 | .000 | .885 | .794 | .000 | .873 | .000 | .250 | .000 | .000 | .250 | .835 | .915 | .250 | .000 | .883 | .921 |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-009 Payen Road-White Rock Road.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| | Placerville Road Southbound | | | | | White Rock Road Westbound | | | | | Payen Road Northbound | | | | | White Rock Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 11 | 0 | 0 | 0 | 11 | 0 | 62 | 19 | 0 | 81 | 1 | 0 | 0 | 0 | 1 | 0 | 45 | 0 | 0 | 45 | 138 | 0 |
| 07:15 | 16 | 0 | 0 | 0 | 16 | 0 | 87 | 20 | 0 | 107 | 0 | 0 | 0 | 0 | 0 | 4 | 60 | 0 | 0 | 64 | 187 | 0 |
| 07:30 | 25 | 0 | 5 | 0 | 30 | 0 | 86 | 19 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 1 | 65 | 0 | 0 | 66 | 201 | 0 |
| 07:45 | 24 | 0 | 0 | 0 | 24 | 1 | 89 | 18 | 0 | 108 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 1 | 0 | 70 | 202 | 0 |
| Total | 76 | 0 | 5 | 0 | 81 | 1 | 324 | 76 | 0 | 401 | 1 | 0 | 0 | 0 | 1 | 5 | 239 | 1 | 0 | 245 | 728 | 0 |
| 08:00 | 24 | 0 | 0 | 0 | 24 | 1 | 59 | 32 | 0 | 92 | 1 | 0 | 0 | 0 | 1 | 0 | 53 | 1 | 0 | 54 | 171 | 0 |
| 08:15 | 23 | 0 | 0 | 0 | 23 | 0 | 59 | 26 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 52 | 160 | 0 |
| 08:30 | 23 | 0 | 6 | 0 | 29 | 0 | 38 | 36 | 0 | 74 | 1 | 0 | 0 | 0 | 1 | 0 | 60 | 0 | 0 | 60 | 164 | 0 |
| 08:45 | 26 | 1 | 0 | 0 | 27 | 0 | 54 | 31 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 52 | 164 | 0 |
| Total | 96 | 1 | 6 | 0 | 103 | 1 | 210 | 125 | 0 | 336 | 2 | 0 | 0 | 0 | 2 | 0 | 217 | 1 | 0 | 218 | 659 | 0 |
| 16:00 | 25 | 0 | 2 | 0 | 27 | 0 | 77 | 43 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 51 | 198 | 0 |
| 16:15 | 32 | 0 | 0 | 0 | 32 | 0 | 64 | 39 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 0 | 0 | 83 | 218 | 0 |
| 16:30 | 26 | 0 | 1 | 0 | 27 | 0 | 111 | 54 | 0 | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 0 | 0 | 95 | 287 | 0 |
| 16:45 | 39 | 0 | 1 | 0 | 40 | 0 | 85 | 43 | 0 | 128 | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 86 | 254 | 0 |
| Total | 122 | 0 | 4 | 0 | 126 | 0 | 337 | 179 | 0 | 516 | 0 | 0 | 0 | 0 | 0 | 0 | 315 | 0 | 0 | 315 | 957 | 0 |
| 17:00 | 27 | 1 | 0 | 0 | 28 | 0 | 87 | 56 | 0 | 143 | 0 | 0 | 0 | 0 | 0 | 0 | 97 | 0 | 0 | 97 | 268 | 0 |
| 17:15 | 27 | 0 | 0 | 0 | 27 | 0 | 71 | 59 | 0 | 130 | 0 | 0 | 0 | 0 | 0 | 2 | 108 | 0 | 0 | 110 | 267 | 0 |
| 17:30 | 30 | 0 | 0 | 0 | 30 | 0 | 62 | 41 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 1 | 107 | 0 | 0 | 108 | 241 | 0 |
| 17:45 | 28 | 0 | 2 | 0 | 30 | 0 | 55 | 33 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 0 | 0 | 69 | 187 | 0 |
| Total | 112 | 1 | 2 | 0 | 115 | 0 | 275 | 189 | 0 | 464 | 0 | 0 | 0 | 0 | 0 | 3 | 381 | 0 | 0 | 384 | 963 | 0 |
| Grand Total | 406 | 2 | 17 | 0 | 425 | 2 | 1146 | 569 | 0 | 1717 | 3 | 0 | 0 | 0 | 3 | 8 | 1152 | 2 | 0 | 1162 | 3307 | 0 |
| Apprch % | 95.5% | 0.5% | 4.0% | 0.0% | | 0.1% | 66.7% | 33.1% | 0.0% | | 100.0% | 0.0% | 0.0% | 0.0% | | 0.7% | 99.1% | 0.2% | 0.0% | | | |
| Total % | 12.3% | 0.1% | 0.5% | 0.0% | 12.9% | 0.1% | 34.7% | 17.2% | 0.0% | 51.9% | 0.1% | 0.0% | 0.0% | 0.0% | 0.1% | 0.2% | 34.8% | 0.1% | 0.0% | 35.1% | 100.0% | |

# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7318-009 Payen Road-White Rock Road.ppd
Date : 5/15/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Placerville Road Southbound | | | | | White Rock Road Westbound | | | | | Payen Road Northbound | | | | | White Rock Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:15 to 08:15 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:15 | | | | | | | | | | | | | | | | | | | | | |
| 07:15 | 16 | 0 | 0 | 0 | 16 | 0 | 87 | 20 | 0 | 107 | 0 | 0 | 0 | 0 | 0 | 4 | 60 | 0 | 0 | 64 | 187 |
| 07:30 | 25 | 0 | 5 | 0 | 30 | 0 | 86 | 19 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 1 | 65 | 0 | 0 | 66 | 201 |
| 07:45 | 24 | 0 | 0 | 0 | 24 | 1 | 89 | 18 | 0 | 108 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 1 | 0 | 70 | 202 |
| 08:00 | 24 | 0 | 0 | 0 | 24 | 1 | 59 | 32 | 0 | 92 | 1 | 0 | 0 | 0 | 1 | 0 | 53 | 1 | 0 | 54 | 171 |
| Total Volume | 89 | 0 | 5 | 0 | 94 | 2 | 321 | 89 | 0 | 412 | 1 | 0 | 0 | 0 | 1 | 5 | 247 | 2 | 0 | 254 | 761 |
| % App Total | 94.7% | 0.0% | 5.3% | 0.0% | | 0.5% | 77.9% | 21.6% | 0.0% | | 100.0% | 0.0% | 0.0% | 0.0% | | 2.0% | 97.2% | 0.8% | 0.0% | | |
| PHF | .890 | .000 | .250 | .000 | .783 | .500 | .902 | .695 | .000 | .954 | .250 | .000 | .000 | .000 | .250 | .313 | .895 | .500 | .000 | .907 | .942 |

| **PM PEAK HOUR** | Placerville Road Southbound | | | | | White Rock Road Westbound | | | | | Payen Road Northbound | | | | | White Rock Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:30 to 17:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:30 | | | | | | | | | | | | | | | | | | | | | |
| 16:30 | 26 | 0 | 1 | 0 | 27 | 0 | 111 | 54 | 0 | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 0 | 0 | 95 | 287 |
| 16:45 | 39 | 0 | 1 | 0 | 40 | 0 | 85 | 43 | 0 | 128 | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 86 | 254 |
| 17:00 | 27 | 1 | 0 | 0 | 28 | 0 | 87 | 56 | 0 | 143 | 0 | 0 | 0 | 0 | 0 | 0 | 97 | 0 | 0 | 97 | 268 |
| 17:15 | 27 | 0 | 0 | 0 | 27 | 0 | 71 | 59 | 0 | 130 | 0 | 0 | 0 | 0 | 0 | 2 | 108 | 0 | 0 | 110 | 267 |
| Total Volume | 119 | 1 | 2 | 0 | 122 | 0 | 354 | 212 | 0 | 566 | 0 | 0 | 0 | 0 | 0 | 2 | 386 | 0 | 0 | 388 | 1076 |
| % App Total | 97.5% | 0.8% | 1.6% | 0.0% | | 0.0% | 62.5% | 37.5% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 0.5% | 99.5% | 0.0% | 0.0% | | |
| PHF | .763 | .250 | .500 | .000 | .763 | .000 | .797 | .898 | .000 | .858 | .000 | .000 | .000 | .000 | .000 | .250 | .894 | .000 | .000 | .882 | .937 |

# All Traffic Data

(916) 771-8700

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

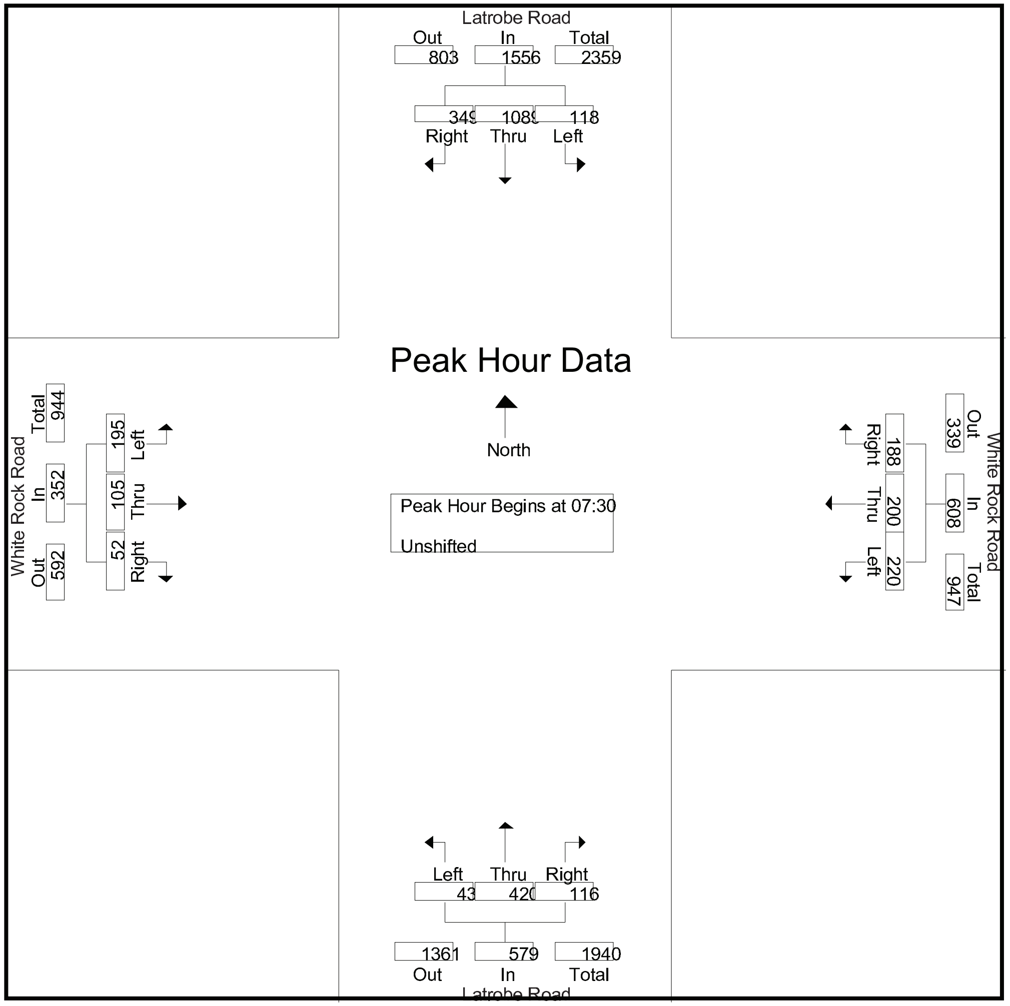
File Name : 12-7225-009 Latrobe-White Rock
Site Code : 00000000
Start Date : 5/22/2012
Page No : 1

**Groups Printed- Unshifted**

| | Latrobe Road Southbound | | | | | White Rock Road Westbound | | | | | Latrobe Road Northbound | | | | | White Rock Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thr | Rig | Ped | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 | 17 | 207 | 48 | 0 | 272 | 22 | 27 | 32 | 0 | 81 | 5 | 97 | 12 | 0 | 114 | 44 | 17 | 9 | 0 | 70 | 0 | 537 | 537 |
| 07:15 | 28 | 215 | 61 | 0 | 304 | 37 | 41 | 46 | 0 | 124 | 11 | 69 | 12 | 0 | 92 | 27 | 21 | 7 | 0 | 55 | 0 | 575 | 575 |
| 07:30 | 32 | 219 | 71 | 0 | 322 | 31 | 50 | 54 | 0 | 135 | 13 | 82 | 18 | 3 | 113 | 45 | 37 | 8 | 0 | 90 | 3 | 660 | 663 |
| 07:45 | 28 | 305 | 97 | 0 | 430 | 66 | 63 | 49 | 0 | 178 | 8 | 105 | 17 | 0 | 130 | 49 | 20 | 15 | 0 | 84 | 0 | 822 | 822 |
| Total | 105 | 946 | 277 | 0 | 1328 | 156 | 181 | 181 | 0 | 518 | 37 | 353 | 59 | 3 | 449 | 165 | 95 | 39 | 0 | 299 | 3 | 2594 | 2597 |
| 08:00 | 30 | 283 | 107 | 0 | 420 | 66 | 37 | 42 | 0 | 145 | 11 | 116 | 44 | 1 | 171 | 55 | 22 | 17 | 0 | 94 | 1 | 830 | 831 |
| 08:15 | 28 | 282 | 74 | 0 | 384 | 57 | 50 | 43 | 1 | 150 | 11 | 117 | 37 | 1 | 165 | 46 | 26 | 12 | 0 | 84 | 2 | 783 | 785 |
| 08:30 | 24 | 190 | 55 | 0 | 269 | 60 | 28 | 50 | 0 | 138 | 14 | 128 | 31 | 2 | 173 | 44 | 19 | 14 | 0 | 77 | 2 | 657 | 659 |
| 08:45 | 32 | 220 | 54 | 0 | 306 | 41 | 18 | 45 | 0 | 104 | 10 | 101 | 30 | 0 | 141 | 54 | 22 | 11 | 0 | 87 | 0 | 638 | 638 |
| Total | 114 | 975 | 290 | 0 | 1379 | 224 | 133 | 180 | 1 | 537 | 46 | 462 | 142 | 4 | 650 | 199 | 89 | 54 | 0 | 342 | 5 | 2908 | 2913 |
| 16:00 | 61 | 77 | 43 | 0 | 181 | 31 | 27 | 56 | 0 | 114 | 22 | 281 | 65 | 0 | 368 | 79 | 55 | 11 | 0 | 145 | 0 | 808 | 808 |
| 16:15 | 79 | 85 | 48 | 0 | 212 | 41 | 28 | 49 | 0 | 118 | 16 | 173 | 41 | 0 | 230 | 57 | 53 | 16 | 0 | 126 | 0 | 686 | 686 |
| 16:30 | 77 | 105 | 48 | 1 | 230 | 34 | 32 | 59 | 1 | 125 | 20 | 289 | 79 | 0 | 388 | 53 | 54 | 11 | 0 | 118 | 2 | 861 | 863 |
| 16:45 | 77 | 114 | 57 | 0 | 248 | 30 | 29 | 41 | 0 | 100 | 17 | 233 | 82 | 0 | 332 | 77 | 58 | 14 | 0 | 149 | 0 | 829 | 829 |
| Total | 294 | 381 | 196 | 1 | 871 | 136 | 116 | 205 | 1 | 457 | 75 | 976 | 267 | 0 | 1318 | 266 | 220 | 52 | 0 | 538 | 2 | 3184 | 3186 |
| 17:00 | 81 | 87 | 64 | 0 | 232 | 28 | 37 | 76 | 0 | 141 | 32 | 323 | 89 | 1 | 444 | 110 | 79 | 12 | 0 | 201 | 1 | 1018 | 1019 |
| 17:15 | 83 | 137 | 66 | 2 | 286 | 50 | 23 | 62 | 0 | 135 | 11 | 216 | 65 | 0 | 292 | 68 | 61 | 25 | 1 | 154 | 3 | 867 | 870 |
| 17:30 | 98 | 129 | 41 | 0 | 268 | 27 | 22 | 55 | 0 | 104 | 27 | 236 | 66 | 0 | 329 | 55 | 53 | 22 | 0 | 130 | 0 | 831 | 831 |
| 17:45 | 90 | 115 | 46 | 0 | 251 | 40 | 37 | 44 | 0 | 121 | 13 | 192 | 38 | 0 | 243 | 53 | 50 | 23 | 0 | 126 | 0 | 741 | 741 |
| Total | 352 | 468 | 217 | 2 | 1037 | 145 | 119 | 237 | 0 | 501 | 83 | 967 | 258 | 1 | 1308 | 286 | 243 | 82 | 1 | 611 | 4 | 3457 | 3461 |
| Grand Total | 865 | 2770 | 980 | 3 | 4615 | 661 | 549 | 803 | 2 | 2013 | 241 | 2758 | 726 | 8 | 3725 | 916 | 647 | 227 | 1 | 1790 | 14 | 12143 | 12157 |
| Apprch % | 18.7 | 60 | 21.2 | | | 32.8 | 27.3 | 39.9 | | | 6.5 | 74 | 19.5 | | | 51.2 | 36.1 | 12.7 | | | | | |
| Total % | 7.1 | 22.8 | 8.1 | | 38 | 5.4 | 4.5 | 6.6 | | 16.6 | 2 | 22.7 | 6 | | 30.7 | 7.5 | 5.3 | 1.9 | | 14.7 | 0.1 | 99.9 | |

| | Latrobe Road Southbound | | | | White Rock Road Westbound | | | | Latrobe Road Northbound | | | | White Rock Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. 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 | **32** | 219 | 71 | 322 | 31 | 50 | **54** | 135 | **13** | 82 | 18 | 113 | 45 | **37** | 8 | 90 | 660 |
| 07:45 | 28 | **305** | 97 | **430** | **66** | **63** | 49 | **178** | 8 | 105 | 17 | 130 | 49 | 20 | 15 | 84 | 822 |
| 08:00 | 30 | 283 | **107** | 420 | 66 | 37 | 42 | 145 | 11 | 116 | **44** | **171** | **55** | 22 | **17** | **94** | **830** |
| 08:15 | 28 | 282 | 74 | 384 | 57 | 50 | 43 | 150 | 11 | **117** | 37 | 165 | 46 | 26 | 12 | 84 | 783 |
| Total Volume | 118 | 1089 | 349 | 1556 | 220 | 200 | 188 | 608 | 43 | 420 | 116 | 579 | 195 | 105 | 52 | 352 | 3095 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % App. Total | 7.6 | 70 | 22.4 | | 36.2 | 32.9 | 30.9 | | 7.4 | 72.5 | 20 | | 55.4 | 29.8 | 14.8 | | |
| PHF | .922 | .893 | .815 | .905 | .833 | .794 | .870 | .854 | .827 | .897 | .659 | .846 | .886 | .709 | .765 | .936 | .932 |




Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:30

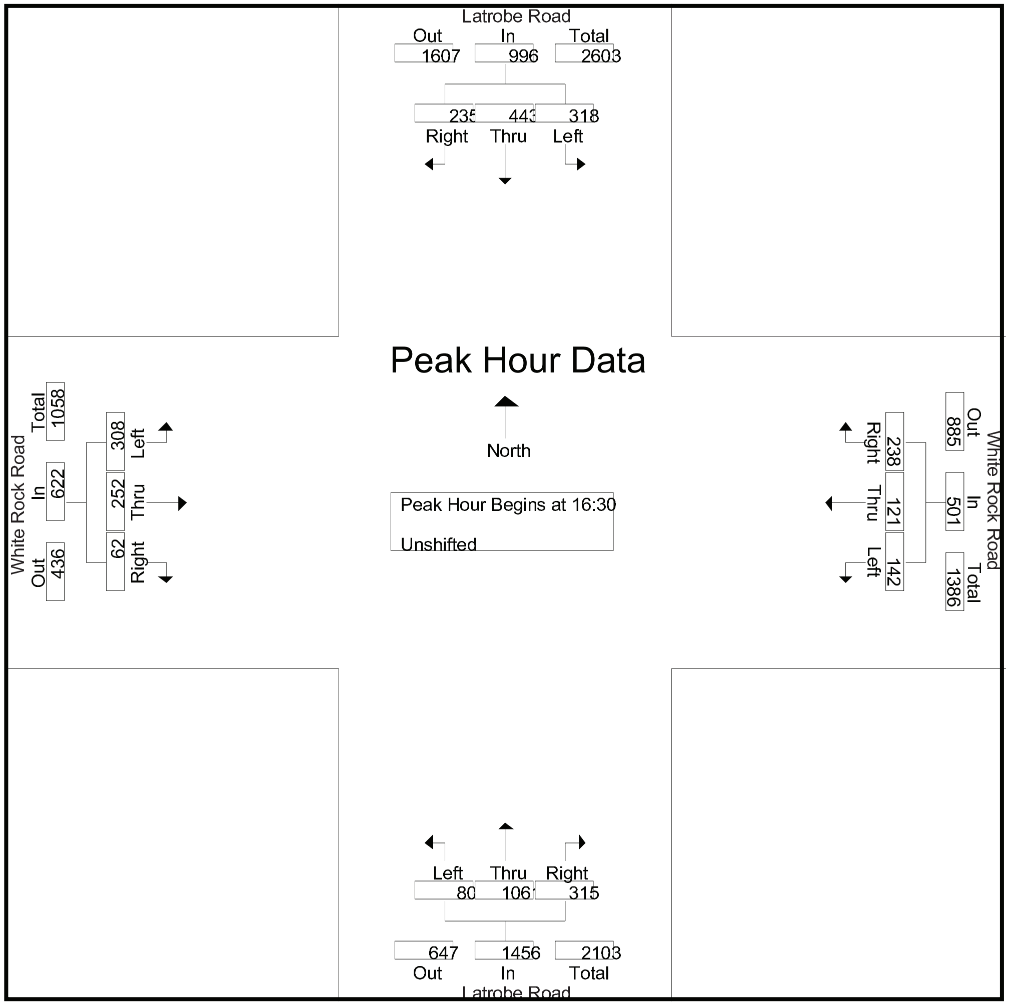
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16:30 | 77 | 105 | 48 | 230 | 34 | 32 | 59 | 125 | 20 | 289 | 79 | 388 | 53 | 54 | 11 | 118 | 861 |
| 16:45 | 77 | 114 | 57 | 248 | 30 | 29 | 41 | 100 | 17 | 233 | 82 | 332 | 77 | 58 | 14 | 149 | 829 |
| 17:00 | 81 | 87 | 64 | 232 | 28 | **37** | **76** | **141** | **32** | **323** | **89** | **444** | **110** | **79** | 12 | **201** | **1018** |
| 17:15 | **83** | **137** | **66** | **286** | **50** | 23 | 62 | 135 | 11 | 216 | 65 | 292 | 68 | 61 | **25** | 154 | 867 |
| Total Volume | 318 | 443 | 235 | 996 | 142 | 121 | 238 | 501 | 80 | 1061 | 315 | 1456 | 308 | 252 | 62 | 622 | 3575 |
| % App. Total | 31.9 | 44.5 | 23.6 | | 28.3 | 24.2 | 47.5 | | 5.5 | 72.9 | 21.6 | | 49.5 | 40.5 | 10 | | |
| PHF | .958 | .808 | .890 | .871 | .710 | .818 | .783 | .888 | .625 | .821 | .885 | .820 | .700 | .797 | .620 | .774 | .878 |

# All Traffic Data

(916) 771-8700

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

File Name : 12-7225-009 Latrobe-White Rock
Site Code : 00000000
Start Date : 5/22/2012
Page No : 3



# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7139-005 Cavitt Drive-Iron Point Road.ppd
Date : 3/11/2014

**Unshifted Count = All Vehicles**

| | Cavitt Drive Southbound | | | | | Iron Point Road Westbound | | | | | Cavitt Drive Northbound | | | | | Iron Point Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 2 | 0 | 9 | 0 | 11 | 3 | 105 | 1 | 0 | 109 | 18 | 0 | 0 | 0 | 18 | 0 | 37 | 25 | 0 | 62 | 200 | 0 |
| 07:15 | 0 | 2 | 12 | 0 | 14 | 0 | 117 | 0 | 0 | 117 | 17 | 1 | 0 | 0 | 18 | 4 | 38 | 21 | 0 | 63 | 212 | 0 |
| 07:30 | 0 | 2 | 15 | 0 | 17 | 0 | 131 | 0 | 0 | 131 | 16 | 0 | 0 | 0 | 16 | 5 | 44 | 23 | 0 | 72 | 236 | 0 |
| 07:45 | 0 | 0 | 12 | 0 | 12 | 0 | 203 | 2 | 0 | 205 | 18 | 1 | 0 | 0 | 19 | 7 | 60 | 27 | 1 | 95 | 331 | 1 |
| Total | 2 | 4 | 48 | 0 | 54 | 3 | 556 | 3 | 0 | 562 | 69 | 2 | 0 | 0 | 71 | 16 | 179 | 96 | 1 | 292 | 979 | 1 |
| 08:00 | 1 | 1 | 14 | 0 | 16 | 1 | 181 | 3 | 0 | 185 | 19 | 1 | 0 | 0 | 20 | 5 | 56 | 31 | 0 | 92 | 313 | 0 |
| 08:15 | 3 | 1 | 10 | 0 | 14 | 0 | 184 | 4 | 0 | 188 | 21 | 2 | 0 | 0 | 23 | 6 | 53 | 21 | 1 | 81 | 306 | 1 |
| 08:30 | 1 | 2 | 12 | 0 | 15 | 0 | 151 | 1 | 0 | 152 | 19 | 0 | 0 | 0 | 19 | 7 | 41 | 18 | 1 | 67 | 253 | 1 |
| 08:45 | 1 | 1 | 7 | 0 | 9 | 0 | 118 | 1 | 0 | 119 | 17 | 2 | 0 | 0 | 19 | 11 | 43 | 27 | 1 | 82 | 229 | 1 |
| Total | 6 | 5 | 43 | 0 | 54 | 1 | 634 | 9 | 0 | 644 | 76 | 5 | 0 | 0 | 81 | 29 | 193 | 97 | 3 | 322 | 1101 | 3 |
| 16:00 | 3 | 6 | 6 | 0 | 15 | 2 | 92 | 5 | 0 | 99 | 93 | 8 | 8 | 0 | 109 | 10 | 81 | 121 | 2 | 214 | 437 | 2 |
| 16:15 | 1 | 1 | 10 | 0 | 12 | 2 | 101 | 3 | 0 | 106 | 67 | 10 | 4 | 0 | 81 | 9 | 131 | 89 | 1 | 230 | 429 | 1 |
| 16:30 | 3 | 6 | 11 | 0 | 20 | 2 | 92 | 3 | 0 | 97 | 86 | 9 | 2 | 0 | 97 | 11 | 136 | 76 | 0 | 223 | 437 | 0 |
| 16:45 | 1 | 2 | 7 | 0 | 10 | 1 | 92 | 3 | 1 | 97 | 84 | 16 | 3 | 0 | 103 | 11 | 147 | 116 | 0 | 274 | 484 | 1 |
| Total | 8 | 15 | 34 | 0 | 57 | 7 | 377 | 14 | 1 | 399 | 330 | 43 | 17 | 0 | 390 | 41 | 495 | 402 | 3 | 941 | 1787 | 4 |
| 17:00 | 5 | 5 | 7 | 0 | 17 | 4 | 87 | 4 | 0 | 95 | 78 | 12 | 6 | 0 | 96 | 7 | 190 | 82 | 1 | 280 | 488 | 1 |
| 17:15 | 6 | 6 | 11 | 0 | 23 | 1 | 78 | 4 | 0 | 83 | 75 | 13 | 5 | 0 | 93 | 19 | 194 | 129 | 5 | 347 | 546 | 5 |
| 17:30 | 5 | 4 | 4 | 0 | 13 | 0 | 111 | 4 | 0 | 115 | 78 | 5 | 6 | 0 | 89 | 14 | 200 | 87 | 0 | 301 | 518 | 0 |
| 17:45 | 3 | 2 | 7 | 0 | 12 | 0 | 96 | 5 | 0 | 101 | 66 | 10 | 3 | 0 | 79 | 15 | 120 | 87 | 0 | 222 | 414 | 0 |
| Total | 19 | 17 | 29 | 0 | 65 | 5 | 372 | 17 | 0 | 394 | 297 | 40 | 20 | 0 | 357 | 55 | 704 | 385 | 6 | 1150 | 1966 | 6 |
| Grand Total | 35 | 41 | 154 | 0 | 230 | 16 | 1939 | 43 | 1 | 1999 | 772 | 90 | 37 | 0 | 899 | 141 | 1571 | 980 | 13 | 2705 | 5833 | 14 |
| Apprch % | 15.2% | 17.8% | 67.0% | 0.0% | | 0.8% | 97.0% | 2.2% | 0.1% | | 85.9% | 10.0% | 4.1% | 0.0% | | 5.2% | 58.1% | 36.2% | 0.5% | | | |
| Total % | 0.6% | 0.7% | 2.6% | 0.0% | 3.9% | 0.3% | 33.2% | 0.7% | 0.0% | 34.3% | 13.2% | 1.5% | 0.6% | 0.0% | 15.4% | 2.4% | 26.9% | 16.8% | 0.2% | 46.4% | 100.0% | |

# ALL TRAFFIC DATA

**(916) 771-8700**
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 14-7139-005 Cavitt Drive-Iron Point Road.ppd
Date : 3/11/2014

**Unshifted Count = All Vehicles**

| **AM PEAK HOUR** | Cavitt Drive Southbound | | | | | Iron Point Road Westbound | | | | | Cavitt Drive Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 07:45 | 0 | 0 | 12 | 0 | 12 | 0 | 203 | 2 | 0 | 205 | 18 | 1 | 0 | 0 | 19 | 7 | 60 | 27 | 1 | 95 | 331 |
| 08:00 | 1 | 1 | 14 | 0 | 16 | 1 | 181 | 3 | 0 | 185 | 19 | 1 | 0 | 0 | 20 | 5 | 56 | 31 | 0 | 92 | 313 |
| 08:15 | 3 | 1 | 10 | 0 | 14 | 0 | 184 | 4 | 0 | 188 | 21 | 2 | 0 | 0 | 23 | 6 | 53 | 21 | 1 | 81 | 306 |
| 08:30 | 1 | 2 | 12 | 0 | 15 | 0 | 151 | 1 | 0 | 152 | 19 | 0 | 0 | 0 | 19 | 7 | 41 | 18 | 1 | 67 | 253 |
| Total Volume | 5 | 4 | 48 | 0 | 57 | 1 | 719 | 10 | 0 | 730 | 77 | 4 | 0 | 0 | 81 | 25 | 210 | 97 | 3 | 335 | 1203 |
| % App Total | 8.8% | 7.0% | 84.2% | 0.0% | | 0.1% | 98.5% | 1.4% | 0.0% | | 95.1% | 4.9% | 0.0% | 0.0% | | 7.5% | 62.7% | 29.0% | 0.9% | | |
| PHF | .417 | .500 | .857 | .000 | .891 | .250 | .885 | .625 | .000 | .890 | .917 | .500 | .000 | .000 | .880 | .893 | .875 | .782 | .750 | .882 | .909 |

| **PM PEAK HOUR** | Cavitt Drive Southbound | | | | | Iron Point Road Westbound | | | | | Cavitt Drive Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 1 | 2 | 7 | 0 | 10 | 1 | 92 | 3 | 1 | 97 | 84 | 16 | 3 | 0 | 103 | 11 | 147 | 116 | 0 | 274 | 484 |
| 17:00 | 5 | 5 | 7 | 0 | 17 | 4 | 87 | 4 | 0 | 95 | 78 | 12 | 6 | 0 | 96 | 7 | 190 | 82 | 1 | 280 | 488 |
| 17:15 | 6 | 6 | 11 | 0 | 23 | 1 | 78 | 4 | 0 | 83 | 75 | 13 | 5 | 0 | 93 | 19 | 194 | 129 | 5 | 347 | 546 |
| 17:30 | 5 | 4 | 4 | 0 | 13 | 0 | 111 | 4 | 0 | 115 | 78 | 5 | 6 | 0 | 89 | 14 | 200 | 87 | 0 | 301 | 518 |
| Total Volume | 17 | 17 | 29 | 0 | 63 | 6 | 368 | 15 | 1 | 390 | 315 | 46 | 20 | 0 | 381 | 51 | 731 | 414 | 6 | 1202 | 2036 |
| % App Total | 27.0% | 27.0% | 46.0% | 0.0% | | 1.5% | 94.4% | 3.8% | 0.3% | | 82.7% | 12.1% | 5.2% | 0.0% | | 4.2% | 60.8% | 34.4% | 0.5% | | |
| PHF | .708 | .708 | .659 | .000 | .685 | .375 | .829 | .938 | .250 | .848 | .938 | .719 | .833 | .000 | .925 | .671 | .914 | .802 | .300 | .866 | .932 |

# ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Folsom
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Nothing on Bank 2

File Name : 13-7632-002 Serpa Way-Iron Point Road.ppd
Date : 11/5/2013

**Unshifted Count = All Vehicles**

| | Serpa Way Southbound | | | | | Iron Point Road Westbound | | | | | Serpa Way Northbound | | | | | Iron Point Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturn Total |
| 07:00 | 2 | 2 | 19 | 0 | 23 | 4 | 107 | 1 | 0 | 112 | 5 | 1 | 0 | 0 | 6 | 4 | 25 | 2 | 0 | 31 | 172 | 0 |
| 07:15 | 2 | 1 | 17 | 0 | 20 | 2 | 94 | 1 | 0 | 97 | 11 | 0 | 1 | 0 | 12 | 7 | 25 | 2 | 0 | 34 | 163 | 0 |
| 07:30 | 1 | 3 | 25 | 0 | 29 | 3 | 122 | 2 | 0 | 127 | 9 | 0 | 1 | 0 | 10 | 18 | 23 | 6 | 0 | 47 | 213 | 0 |
| 07:45 | 2 | 7 | 23 | 0 | 32 | 6 | 141 | 1 | 0 | 148 | 9 | 2 | 1 | 0 | 12 | 16 | 28 | 5 | 0 | 49 | 241 | 0 |
| Total | 7 | 13 | 84 | 0 | 104 | 15 | 464 | 5 | 0 | 484 | 34 | 3 | 3 | 0 | 40 | 45 | 101 | 15 | 0 | 161 | 789 | 0 |
| 08:00 | 23 | 4 | 26 | 0 | 53 | 7 | 127 | 3 | 0 | 137 | 21 | 2 | 0 | 0 | 23 | 10 | 52 | 7 | 0 | 69 | 282 | 0 |
| 08:15 | 5 | 3 | 10 | 0 | 18 | 14 | 148 | 11 | 0 | 173 | 22 | 1 | 2 | 0 | 25 | 8 | 28 | 4 | 0 | 40 | 256 | 0 |
| 08:30 | 0 | 2 | 17 | 0 | 19 | 5 | 104 | 1 | 0 | 110 | 17 | 3 | 0 | 0 | 20 | 2 | 27 | 7 | 0 | 36 | 185 | 0 |
| 08:45 | 1 | 2 | 13 | 0 | 16 | 4 | 69 | 0 | 0 | 73 | 20 | 1 | 1 | 0 | 22 | 2 | 20 | 8 | 0 | 30 | 141 | 0 |
| Total | 29 | 11 | 66 | 0 | 106 | 30 | 448 | 15 | 0 | 493 | 80 | 7 | 3 | 0 | 90 | 22 | 127 | 26 | 0 | 175 | 864 | 0 |
| 16:00 | 2 | 5 | 8 | 0 | 15 | 3 | 45 | 1 | 0 | 49 | 32 | 10 | 8 | 0 | 50 | 16 | 81 | 21 | 0 | 118 | 232 | 0 |
| 16:15 | 1 | 3 | 10 | 0 | 14 | 8 | 43 | 0 | 0 | 51 | 44 | 8 | 9 | 0 | 61 | 23 | 82 | 12 | 0 | 117 | 243 | 0 |
| 16:30 | 0 | 2 | 9 | 0 | 11 | 5 | 53 | 2 | 0 | 60 | 32 | 4 | 14 | 0 | 50 | 20 | 91 | 15 | 0 | 126 | 247 | 0 |
| 16:45 | 0 | 4 | 9 | 0 | 13 | 9 | 46 | 2 | 0 | 57 | 33 | 3 | 11 | 0 | 47 | 25 | 111 | 20 | 0 | 156 | 273 | 0 |
| Total | 3 | 14 | 36 | 0 | 53 | 25 | 187 | 5 | 0 | 217 | 141 | 25 | 42 | 0 | 208 | 84 | 365 | 68 | 0 | 517 | 995 | 0 |
| 17:00 | 1 | 4 | 9 | 0 | 14 | 2 | 39 | 3 | 0 | 44 | 37 | 9 | 14 | 0 | 60 | 24 | 118 | 6 | 1 | 149 | 267 | 1 |
| 17:15 | 0 | 5 | 8 | 0 | 13 | 7 | 41 | 2 | 0 | 50 | 22 | 8 | 13 | 0 | 43 | 20 | 121 | 16 | 1 | 158 | 264 | 1 |
| 17:30 | 0 | 2 | 5 | 0 | 7 | 3 | 54 | 0 | 1 | 58 | 25 | 6 | 12 | 0 | 43 | 26 | 124 | 7 | 0 | 157 | 265 | 1 |
| 17:45 | 0 | 5 | 8 | 0 | 13 | 5 | 46 | 0 | 0 | 51 | 24 | 7 | 9 | 0 | 40 | 12 | 99 | 15 | 0 | 126 | 230 | 0 |
| Total | 1 | 16 | 30 | 0 | 47 | 17 | 180 | 5 | 1 | 203 | 108 | 30 | 48 | 0 | 186 | 82 | 462 | 44 | 2 | 590 | 1026 | 3 |
| Grand Total | 40 | 54 | 216 | 0 | 310 | 87 | 1279 | 30 | 1 | 1397 | 363 | 65 | 96 | 0 | 524 | 233 | 1055 | 153 | 2 | 1443 | 3674 | 3 |
| Apprch % | 12.9% | 17.4% | 69.7% | 0.0% | | 6.2% | 91.6% | 2.1% | 0.1% | | 69.3% | 12.4% | 18.3% | 0.0% | | 16.1% | 73.1% | 10.6% | 0.1% | | | |
| Total % | 1.1% | 1.5% | 5.9% | 0.0% | 8.4% | 2.4% | 34.8% | 0.8% | 0.0% | 38.0% | 9.9% | 1.8% | 2.6% | 0.0% | 14.3% | 6.3% | 28.7% | 4.2% | 0.1% | 39.3% | 100.0% | |

| AM PEAK HOUR | Serpa Way Southbound | | | | | Iron Point Road Westbound | | | | | Serpa Way Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 07:30 | 1 | 3 | 25 | 0 | 29 | 3 | 122 | 2 | 0 | 127 | 9 | 0 | 1 | 0 | 10 | 18 | 23 | 6 | 0 | 47 | 213 |
| 07:45 | 2 | 7 | 23 | 0 | 32 | 6 | 141 | 1 | 0 | 148 | 9 | 2 | 1 | 0 | 12 | 16 | 28 | 5 | 0 | 49 | 241 |
| 08:00 | 23 | 4 | 26 | 0 | 53 | 7 | 127 | 3 | 0 | 137 | 21 | 2 | 0 | 0 | 23 | 10 | 52 | 7 | 0 | 69 | 282 |
| 08:15 | 5 | 3 | 10 | 0 | 18 | 14 | 148 | 11 | 0 | 173 | 22 | 1 | 2 | 0 | 25 | 8 | 28 | 4 | 0 | 40 | 256 |
| Total Volume | 31 | 17 | 84 | 0 | 132 | 30 | 538 | 17 | 0 | 585 | 61 | 5 | 4 | 0 | 70 | 52 | 131 | 22 | 0 | 205 | 992 |
| % App Total | 23.5% | 12.9% | 63.6% | 0.0% | | 5.1% | 92.0% | 2.9% | 0.0% | | 87.1% | 7.1% | 5.7% | 0.0% | | 25.4% | 63.9% | 10.7% | 0.0% | | |
| PHF | .337 | .607 | .808 | .000 | .623 | .536 | .909 | .386 | .000 | .845 | .693 | .625 | .500 | .000 | .700 | .722 | .630 | .786 | .000 | .743 | .879 |

| PM PEAK HOUR | Serpa Way Southbound | | | | | Iron Point Road Westbound | | | | | Serpa Way Northbound | | | | | Iron Point Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:45 to 17:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:45 | | | | | | | | | | | | | | | | | | | | | |
| 16:45 | 0 | 4 | 9 | 0 | 13 | 9 | 46 | 2 | 0 | 57 | 33 | 3 | 11 | 0 | 47 | 25 | 111 | 20 | 0 | 156 | 273 |
| 17:00 | 1 | 4 | 9 | 0 | 14 | 2 | 39 | 3 | 0 | 44 | 37 | 9 | 14 | 0 | 60 | 24 | 118 | 6 | 1 | 149 | 267 |
| 17:15 | 0 | 5 | 8 | 0 | 13 | 7 | 41 | 2 | 0 | 50 | 22 | 8 | 13 | 0 | 43 | 20 | 121 | 16 | 1 | 158 | 264 |
| 17:30 | 0 | 2 | 5 | 0 | 7 | 3 | 54 | 0 | 1 | 58 | 25 | 6 | 12 | 0 | 43 | 26 | 124 | 7 | 0 | 157 | 265 |
| Total Volume | 1 | 15 | 31 | 0 | 47 | 21 | 180 | 7 | 1 | 209 | 117 | 26 | 50 | 0 | 193 | 95 | 474 | 49 | 2 | 620 | 1069 |
| % App Total | 2.1% | 31.9% | 66.0% | 0.0% | | 10.0% | 86.1% | 3.3% | 0.5% | | 60.6% | 13.5% | 25.9% | 0.0% | | 15.3% | 76.5% | 7.9% | 0.3% | | |
| PHF | .250 | .750 | .861 | .000 | .839 | .583 | .833 | .583 | .250 | .901 | .791 | .722 | .893 | .000 | .804 | .913 | .956 | .613 | .500 | .981 | .979 |

# APPENDIX B: INTERSECTION LOS CALCULATIONS

# Existing Conditions

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 11 | 42 | 37 | 255 | 273 | 116 | 39 | 1047 | 166 | 86 | 763 | 15 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 12 | 47 | 0 | 283 | 303 | 0 | 43 | 1163 | 0 | 96 | 848 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 23 | 307 | 96 | 374 | 826 | 257 | 80 | 2725 | 849 | 161 | 2845 | 886 |
| Arrive On Green | 0.01 | 0.06 | 0.00 | 0.11 | 0.16 | 0.00 | 0.02 | 0.54 | 0.00 | 0.05 | 0.56 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 12 | 47 | 0 | 283 | 303 | 0 | 43 | 1163 | 0 | 96 | 848 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 0.3 | 0.7 | 0.0 | 6.3 | 4.2 | 0.0 | 1.0 | 10.9 | 0.0 | 2.2 | 7.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.3 | 0.7 | 0.0 | 6.3 | 4.2 | 0.0 | 1.0 | 10.9 | 0.0 | 2.2 | 7.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 23 | 307 | 96 | 374 | 826 | 257 | 80 | 2725 | 849 | 161 | 2845 | 886 |
| V/C Ratio(X) | 0.52 | 0.15 | 0.00 | 0.76 | 0.37 | 0.00 | 0.54 | 0.43 | 0.00 | 0.60 | 0.30 | 0.00 |
| Avail Cap(c_a), veh/h | 658 | 1798 | 560 | 658 | 1798 | 560 | 658 | 2725 | 849 | 658 | 2845 | 886 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 39.1 | 35.2 | 0.0 | 34.2 | 29.4 | 0.0 | 38.1 | 11.0 | 0.0 | 36.9 | 9.2 | 0.0 |
| Incr Delay (d2), s/veh | 6.7 | 0.4 | 0.0 | 1.2 | 0.5 | 0.0 | 2.1 | 0.5 | 0.0 | 1.3 | 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 | 0.2 | 0.3 | 0.0 | 3.0 | 2.0 | 0.0 | 0.5 | 5.2 | 0.0 | 1.1 | 3.3 | 0.0 |
| LnGrp Delay(d),s/veh | 45.7 | 35.6 | 0.0 | 35.3 | 29.9 | 0.0 | 40.2 | 11.5 | 0.0 | 38.2 | 9.5 | 0.0 |
| LnGrp LOS | D | D | | D | C | | D | B | | D | A | |
| Approach Vol, veh/h | | 59 | | | 586 | | | 1206 | | | 944 | |
| Approach Delay, s/veh | | 37.6 | | | 32.5 | | | 12.5 | | | 12.4 | |
| Approach LOS | | D | | | 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 | 8.2 | 88.7 | 5.0 | 18.1 | 6.3 | 90.5 | 13.1 | 10.1 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 15.1 | 42.3 | 15.1 | 27.9 | 15.1 | 42.3 | 15.1 | 27.9 |
| Max Q Clear Time (g_c+I1), s | 4.2 | 12.9 | 2.3 | 6.2 | 3.0 | 9.0 | 8.3 | 2.7 |
| Green Ext Time (p_c), s | 0.0 | 26.7 | 0.0 | 3.3 | 0.0 | 29.9 | 0.3 | 3.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.2 |
| HCM 2010 LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 14.9 |
| Intersection LOS | B |

| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 70 | 15 | 103 | 0 | 7 | 35 | 19 | 0 | 107 | 136 | 3 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 80 | 17 | 117 | 0 | 8 | 40 | 22 | 0 | 122 | 155 | 3 |
| Number of Lanes | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 3 | 3 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 3 | 3 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 3 | 3 | 1 |
| HCM Control Delay | 10.9 | 11.6 | 12.1 |
| HCM LOS | B | B | B |

| Lane | NBLn1 | NBLn2 | NBLn3 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 100% | 65% | 0% | 11% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 94% | 0% | 35% | 0% | 57% | 0% | 100% | 33% |
| Vol Right, % | 0% | 0% | 6% | 0% | 0% | 100% | 31% | 0% | 0% | 67% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 107 | 91 | 48 | 42 | 43 | 103 | 61 | 22 | 240 | 362 |
| LT Vol | 0 | 91 | 45 | 0 | 15 | 0 | 35 | 0 | 240 | 120 |
| Through Vol | 0 | 0 | 3 | 0 | 0 | 103 | 19 | 0 | 0 | 242 |
| RT Vol | 107 | 0 | 0 | 42 | 28 | 0 | 7 | 22 | 0 | 0 |
| Lane Flow Rate | 122 | 103 | 55 | 48 | 49 | 117 | 69 | 25 | 273 | 411 |
| Geometry Grp | 8 | 8 | 8 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.256 | 0.203 | 0.107 | 0.1 | 0.1 | 0.207 | 0.145 | 0.048 | 0.48 | 0.67 |
| Departure Headway (Hd) | 7.588 | 7.081 | 7.037 | 7.573 | 7.398 | 6.367 | 7.549 | 6.843 | 6.338 | 5.865 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 471 | 504 | 506 | 471 | 482 | 561 | 472 | 521 | 567 | 613 |
| Service Time | 5.373 | 4.866 | 4.822 | 5.351 | 5.176 | 4.144 | 5.347 | 4.61 | 4.105 | 3.631 |
| HCM Lane V/C Ratio | 0.259 | 0.204 | 0.109 | 0.102 | 0.102 | 0.209 | 0.146 | 0.048 | 0.481 | 0.67 |
| HCM Control Delay | 13 | 11.7 | 10.7 | 11.2 | 11 | 10.8 | 11.6 | 10 | 14.9 | 19.8 |
| HCM Lane LOS | B | B | B | B | B | B | B | A | B | C |
| HCM 95th-tile Q | 1 | 0.8 | 0.4 | 0.3 | 0.3 | 0.8 | 0.5 | 0.2 | 2.6 | 5.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | |
| Intersection LOS | |

| Movement | SBU | SBL | SBT | SBR |
|---|---|---|---|---|
| Vol, veh/h | 0 | 22 | 360 | 242 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 25 | 409 | 275 |
| Number of Lanes | 0 | 1 | 2 | 0 |

| Approach | SB |
|---|---|
| Opposing Approach | NB |
| Opposing Lanes | 3 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 1 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 17.6 |
| HCM LOS | C |

| Lane |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 67 | 200 | 64 | 88 | 440 | 21 | 11 | 5 | 7 | 54 | 45 | 282 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 72 | 215 | 18 | 95 | 473 | 0 | 8 | 10 | 0 | 58 | 48 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 138 | 2008 | 624 | 180 | 2070 | 644 | 30 | 32 | 27 | 222 | 120 | 102 |
| Arrive On Green | 0.04 | 0.39 | 0.39 | 0.05 | 0.41 | 0.00 | 0.02 | 0.02 | 0.00 | 0.06 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1581 | 3442 | 5085 | 1583 | 1774 | 1863 | 1583 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 72 | 215 | 18 | 95 | 473 | 0 | 8 | 10 | 0 | 58 | 48 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1581 | 1721 | 1695 | 1583 | 1774 | 1863 | 1583 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 0.8 | 1.1 | 0.3 | 1.1 | 2.5 | 0.0 | 0.2 | 0.2 | 0.0 | 0.6 | 1.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.8 | 1.1 | 0.3 | 1.1 | 2.5 | 0.0 | 0.2 | 0.2 | 0.0 | 0.6 | 1.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 138 | 2008 | 624 | 180 | 2070 | 644 | 30 | 32 | 27 | 222 | 120 | 102 |
| V/C Ratio(X) | 0.52 | 0.11 | 0.03 | 0.53 | 0.23 | 0.00 | 0.26 | 0.32 | 0.00 | 0.26 | 0.40 | 0.00 |
| Avail Cap(c_a), veh/h | 2135 | 8581 | 2668 | 2135 | 8581 | 2672 | 1101 | 1156 | 982 | 3416 | 1849 | 1572 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 19.0 | 7.7 | 7.5 | 18.6 | 7.8 | 0.0 | 19.6 | 19.6 | 0.0 | 17.9 | 18.1 | 0.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.1 | 0.0 | 0.9 | 0.1 | 0.0 | 1.7 | 2.1 | 0.0 | 0.2 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.5 | 0.1 | 0.5 | 1.2 | 0.0 | 0.1 | 0.1 | 0.0 | 0.3 | 0.5 | 0.0 |
| LnGrp Delay(d),s/veh | 20.1 | 7.8 | 7.5 | 19.5 | 8.0 | 0.0 | 21.3 | 21.7 | 0.0 | 18.2 | 18.9 | 0.0 |
| LnGrp LOS | C | A | A | B | A | | C | C | | B | B | |
| Approach Vol, veh/h | | 305 | | | 568 | | | 18 | | | 106 | |
| Approach Delay, s/veh | | 10.7 | | | 9.9 | | | 21.5 | | | 18.5 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| **Timer** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 6.6 | 21.4 | | 5.2 | 6.1 | 21.9 | | 7.1 | | | | |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 25.0 | 68.0 | | 25.0 | 25.0 | 68.0 | | 40.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.1 | 3.1 | | 2.2 | 2.8 | 4.5 | | 3.0 | | | | |
| Green Ext Time (p_c), s | 0.1 | 11.8 | | 0.0 | 0.1 | 11.8 | | 0.2 | | | | |
| **Intersection Summary** | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 11.3 | | | | | | | | | |
| HCM 2010 LOS | | | B | | | | | | | | | |

**Notes**

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 38 | 48 | 242 | 498 | 204 | 82 | 576 | 1179 | 232 | 51 | 955 | 32 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 40 | 51 | 15 | 524 | 215 | 0 | 606 | 1241 | 0 | 54 | 1005 | 0 |
| Adj No. of Lanes | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 75 | 206 | 92 | 622 | 1095 | 341 | 719 | 2503 | 779 | 99 | 1587 | 494 |
| Arrive On Green | 0.02 | 0.06 | 0.06 | 0.18 | 0.22 | 0.00 | 0.07 | 0.16 | 0.00 | 0.03 | 0.31 | 0.00 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 40 | 51 | 15 | 524 | 215 | 0 | 606 | 1241 | 0 | 54 | 1005 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 0.9 | 1.1 | 0.7 | 11.8 | 2.8 | 0.0 | 14.1 | 18.0 | 0.0 | 1.3 | 13.7 | 0.0 |
| Cycle Q Clear(g_c), s | 0.9 | 1.1 | 0.7 | 11.8 | 2.8 | 0.0 | 14.1 | 18.0 | 0.0 | 1.3 | 13.7 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 75 | 206 | 92 | 622 | 1095 | 341 | 719 | 2503 | 779 | 99 | 1587 | 494 |
| V/C Ratio(X) | 0.53 | 0.25 | 0.16 | 0.84 | 0.20 | 0.00 | 0.84 | 0.50 | 0.00 | 0.55 | 0.63 | 0.00 |
| Avail Cap(c_a), veh/h | 897 | 957 | 428 | 906 | 1375 | 428 | 999 | 2503 | 779 | 999 | 2129 | 663 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.72 | 0.72 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 39.2 | 36.4 | 36.3 | 32.2 | 26.0 | 0.0 | 36.4 | 24.8 | 0.0 | 38.8 | 23.9 | 0.0 |
| Incr Delay (d2), s/veh | 2.2 | 1.5 | 2.0 | 3.3 | 0.3 | 0.0 | 2.6 | 0.5 | 0.0 | 1.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.6 | 0.4 | 6.0 | 1.3 | 0.0 | 7.0 | 8.6 | 0.0 | 0.6 | 6.6 | 0.0 |
| LnGrp Delay(d),s/veh | 41.4 | 38.0 | 38.3 | 35.5 | 26.3 | 0.0 | 39.0 | 25.3 | 0.0 | 40.5 | 24.8 | 0.0 |
| LnGrp LOS | D | D | D | D | C | | D | C | | D | C | |
| Approach Vol, veh/h | | 106 | | | 739 | | | 1847 | | | 1059 | |
| Approach Delay, s/veh | | 39.3 | | | 32.8 | | | 29.8 | | | 25.6 | |
| Approach LOS | | D | | | C | | | C | | | 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 | 6.8 | 84.2 | 6.3 | 22.7 | 60.4 | 30.6 | 19.0 | 10.0 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 23.5 | 33.9 | 21.1 | 21.9 | 23.5 | 33.9 | 21.1 | 21.9 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 20.0 | 2.9 | 4.8 | 16.1 | 15.7 | 13.8 | 3.1 |
| Green Ext Time (p_c), s | 0.1 | 13.2 | 0.0 | 2.8 | 0.8 | 9.6 | 0.7 | 3.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 29.5 |
| HCM 2010 LOS | C |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.8 |
| Intersection LOS | A |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 2 | 99 | 102 | 0 | 200 | 19 | 0 | 16 | 320 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 3 | 125 | 129 | 0 | 253 | 24 | 0 | 20 | 405 |
| Number of Lanes | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 2 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 3 | 3 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 3 | 0 | 3 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 3 | 3 |
| HCM Control Delay | 10.6 | 10.9 | 8.7 |
| HCM LOS | B | B | A |

| Lane | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 100% | 100% | 100% | 78% | 0% | 0% | 0% |
| Vol Right, % | 0% | 0% | 0% | 0% | 0% | 22% | 0% | 100% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 101 | 51 | 51 | 0 | 133 | 86 | 16 | 160 | 160 |
| LT Vol | 0 | 51 | 51 | 0 | 133 | 67 | 0 | 0 | 0 |
| Through Vol | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 160 | 160 |
| RT Vol | 101 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 |
| Lane Flow Rate | 128 | 65 | 65 | 0 | 169 | 108 | 20 | 203 | 203 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 |
| Degree of Util (X) | 0.239 | 0.111 | 0.111 | 0 | 0.29 | 0.182 | 0.036 | 0.293 | 0.195 |
| Departure Headway (Hd) | 6.721 | 6.216 | 6.216 | 6.19 | 6.19 | 6.034 | 6.532 | 5.327 | 3.586 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 536 | 578 | 578 | 0 | 582 | 597 | 551 | 678 | 1007 |
| Service Time | 4.438 | 3.933 | 3.933 | 3.904 | 3.904 | 3.747 | 4.232 | 3.027 | 1.286 |
| HCM Lane V/C Ratio | 0.239 | 0.112 | 0.112 | 0 | 0.29 | 0.181 | 0.036 | 0.299 | 0.202 |
| HCM Control Delay | 11.5 | 9.7 | 9.7 | 8.9 | 11.4 | 10.1 | 9.5 | 10.2 | 7.2 |
| HCM Lane LOS | B | A | A | N | B | B | A | B | A |
| HCM 95th-tile Q | 0.9 | 0.4 | 0.4 | 0 | 1.2 | 0.7 | 0.1 | 1.2 | 0.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 353 | 0 | 1634 | 145 | 173 | 703 | 888 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.94 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4527 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4527 | 1362 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 380 | 0 | 1757 | 156 | 186 | 756 | 955 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 46 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 329 | 0 | 1757 | 110 | 186 | 1234 | 477 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 31.2 | | 68.2 | 68.2 | 31.2 | 120.0 | 120.0 |
| Effective Green, g (s) | | | | | | 31.2 | | 68.2 | 68.2 | 31.2 | 120.0 | 120.0 |
| Actuated g/C Ratio | | | | | | 0.26 | | 0.57 | 0.57 | 0.26 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 418 | | 2889 | 899 | 460 | 4527 | 1362 |
| v/s Ratio Prot | | | | | | c0.20 | | c0.35 | | 0.11 | 0.27 | |
| v/s Ratio Perm | | | | | | | | | 0.07 | | | 0.35 |
| v/c Ratio | | | | | | 0.79 | | 0.61 | 0.12 | 0.40 | 0.27 | 0.35 |
| Uniform Delay, d1 | | | | | | 41.3 | | 17.1 | 12.0 | 36.7 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 8.7 | | 0.7 | 0.2 | 0.2 | 0.1 | 0.5 |
| Delay (s) | | | | | | 50.1 | | 17.8 | 12.2 | 31.3 | 0.1 | 0.5 |
| Level of Service | | | | | | D | | B | B | C | A | A |
| Approach Delay (s) | | 0.0 | | | 50.1 | | | 17.3 | | | 3.3 | |
| Approach LOS | | A | | | D | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 62.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 123 | 963 | 816 | 46 | 0 | 703 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 132 | 889 | 877 | 0 | 0 | 756 |
| Adj No. of Lanes | 2 | 2 | 2 | 1 | 0 | 3 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 1310 | 1061 | 1531 | 650 | 0 | 2089 |
| Arrive On Green | 0.38 | 0.38 | 0.41 | 0.00 | 0.00 | 0.41 |
| Sat Flow, veh/h | 3442 | 2787 | 3725 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 132 | 889 | 877 | 0 | 0 | 756 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1863 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 1.1 | 13.4 | 8.4 | 0.0 | 0.0 | 4.7 |
| Cycle Q Clear(g_c), s | 1.1 | 13.4 | 8.4 | 0.0 | 0.0 | 4.7 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 1310 | 1061 | 1531 | 650 | 0 | 2089 |
| V/C Ratio(X) | 0.10 | 0.84 | 0.57 | 0.00 | 0.00 | 0.36 |
| Avail Cap(c_a), veh/h | 2242 | 1815 | 4045 | 1719 | 0 | 5521 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 9.2 | 13.0 | 10.5 | 0.0 | 0.0 | 9.4 |
| Incr Delay (d2), s/veh | 0.0 | 0.7 | 0.1 | 0.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 5.2 | 4.3 | 0.0 | 0.0 | 2.2 |
| LnGrp Delay(d),s/veh | 9.2 | 13.7 | 10.6 | 0.0 | 0.0 | 9.4 |
| LnGrp LOS | A | B | B | | | A |
| Approach Vol, veh/h | 1021 | | 877 | | | 756 |
| Approach Delay, s/veh | 13.1 | | 10.6 | | | 9.4 |
| Approach LOS | B | | B | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 24.2 | | | | 24.2 | | 21.8 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 50.0 | | | | 50.0 | | 30.0 |
| Max Q Clear Time (g_c+I1), s | | 10.4 | | | | 6.7 | | 15.4 |
| Green Ext Time (p_c), s | | 8.6 | | | | 8.6 | | 2.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 11.2 |
| HCM 2010 LOS | | B |

## Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 667 | 0 | 80 | 0 | 0 | 0 | 0 | 195 | 74 | 0 | 276 | 550 |
| 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 | 741 | 0 | 29 | | | | 0 | 217 | 0 | 0 | 307 | 0 |
| Adj No. of Lanes | 2 | 0 | 1 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1111 | 0 | 511 | | | | 0 | 1012 | 453 | 0 | 1065 | 453 |
| Arrive On Green | 0.32 | 0.00 | 0.32 | | | | 0.00 | 0.29 | 0.00 | 0.00 | 0.29 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 1583 | | | | 0 | 3632 | 1583 | 0 | 3725 | 1583 |
| Grp Volume(v), veh/h | 741 | 0 | 29 | | | | 0 | 217 | 0 | 0 | 307 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1583 | | | | 0 | 1770 | 1583 | 0 | 1863 | 1583 |
| Q Serve(g_s), s | 4.6 | 0.0 | 0.3 | | | | 0.0 | 1.1 | 0.0 | 0.0 | 1.6 | 0.0 |
| Cycle Q Clear(g_c), s | 4.6 | 0.0 | 0.3 | | | | 0.0 | 1.1 | 0.0 | 0.0 | 1.6 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1111 | 0 | 511 | | | | 0 | 1012 | 453 | 0 | 1065 | 453 |
| V/C Ratio(X) | 0.67 | 0.00 | 0.06 | | | | 0.00 | 0.21 | 0.00 | 0.00 | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 3508 | 0 | 1614 | | | | 0 | 6493 | 2905 | 0 | 6834 | 2905 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.2 | 0.0 | 5.7 | | | | 0.0 | 6.7 | 0.0 | 0.0 | 6.8 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 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 | 2.2 | 0.0 | 0.1 | | | | 0.0 | 0.5 | 0.0 | 0.0 | 0.8 | 0.0 |
| LnGrp Delay(d),s/veh | 7.4 | 0.0 | 5.7 | | | | 0.0 | 6.7 | 0.0 | 0.0 | 6.9 | 0.0 |
| LnGrp LOS | A | | A | | | | | A | | | A | |
| Approach Vol, veh/h | | 770 | | | | | | 217 | | | 307 | |
| Approach Delay, s/veh | | 7.4 | | | | | | 6.7 | | | 6.9 | |
| Approach LOS | | A | | | | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 12.3 | | 12.2 | | 12.3 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 45.0 | | * 25 | | 45.0 | | |
| Max Q Clear Time (g_c+I1), s | | 3.1 | | 6.6 | | 3.6 | | |
| Green Ext Time (p_c), s | | 2.1 | | 1.4 | | 2.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.1 |
| 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 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 153 | 61 | 695 | 89 | 113 | 43 | 461 | 503 | 108 | 49 | 832 | 963 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 165 | 151 | 288 | 79 | 146 | 19 | 496 | 541 | 103 | 53 | 990 | 479 |
| Adj No. of Lanes | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 2 | 0 | 1 | 2 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 197 | 180 | 329 | 158 | 288 | 37 | 787 | 1403 | 266 | 126 | 1131 | 481 |
| Arrive On Green | 0.21 | 0.21 | 0.21 | 0.09 | 0.09 | 0.09 | 0.23 | 0.47 | 0.47 | 0.07 | 0.30 | 0.30 |
| Sat Flow, veh/h | 948 | 867 | 1583 | 1774 | 3238 | 415 | 3442 | 2968 | 563 | 1774 | 3725 | 1583 |
| Grp Volume(v), veh/h | 316 | 0 | 288 | 79 | 83 | 82 | 496 | 322 | 322 | 53 | 990 | 479 |
| Grp Sat Flow(s),veh/h/ln | 1815 | 0 | 1583 | 1774 | 1863 | 1790 | 1721 | 1770 | 1762 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 18.8 | 0.0 | 19.8 | 4.8 | 4.8 | 4.9 | 14.6 | 13.2 | 13.3 | 3.2 | 28.3 | 33.9 |
| Cycle Q Clear(g_c), s | 18.8 | 0.0 | 19.8 | 4.8 | 4.8 | 4.9 | 14.6 | 13.2 | 13.3 | 3.2 | 28.3 | 33.9 |
| Prop In Lane | 0.52 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 0.32 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 377 | 0 | 329 | 158 | 166 | 159 | 787 | 836 | 833 | 126 | 1131 | 481 |
| V/C Ratio(X) | 0.84 | 0.00 | 0.88 | 0.50 | 0.50 | 0.51 | 0.63 | 0.38 | 0.39 | 0.42 | 0.88 | 1.00 |
| Avail Cap(c_a), veh/h | 614 | 0 | 536 | 253 | 265 | 255 | 787 | 836 | 833 | 158 | 1131 | 481 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.7 | 0.0 | 43.1 | 48.8 | 48.8 | 48.9 | 39.0 | 19.1 | 19.1 | 49.9 | 37.1 | 39.1 |
| Incr Delay (d2), s/veh | 2.6 | 0.0 | 5.3 | 0.9 | 0.9 | 1.0 | 1.2 | 1.3 | 1.4 | 0.8 | 9.6 | 40.2 |
| 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 | 9.7 | 0.0 | 9.1 | 2.4 | 2.5 | 2.5 | 7.1 | 6.7 | 6.8 | 1.6 | 16.1 | 20.1 |
| LnGrp Delay(d),s/veh | 45.2 | 0.0 | 48.4 | 49.7 | 49.7 | 49.8 | 40.3 | 20.4 | 20.5 | 50.8 | 46.7 | 79.3 |
| LnGrp LOS | D | | D | D | D | D | D | C | C | D | D | E |
| Approach Vol, veh/h | | 604 | | | 244 | | | 1140 | | | 1522 | |
| Approach Delay, s/veh | | 46.7 | | | 49.7 | | | 29.1 | | | 57.1 | |
| Approach LOS | | D | | | D | | | 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 | 12.0 | 81.1 | | 27.9 | 53.7 | 39.4 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 5.3 | * 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 10.0 | 53.1 | | 38.0 | 24.7 | * 34 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | 5.2 | 15.3 | | 21.8 | 16.6 | 35.9 | | 6.9 |
| Green Ext Time (p_c), s | 0.0 | 4.8 | | 1.5 | 3.0 | 0.0 | | 0.4 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 45.7 |
| HCM 2010 LOS | | | D |

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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 1026 | 0 | 0 | 339 | 0 | 733 | 243 | 262 | 1354 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1544 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1544 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 1103 | 0 | 0 | 365 | 0 | 788 | 261 | 282 | 1456 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 72 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 1074 | 0 | 0 | 365 | 0 | 788 | 189 | 282 | 1456 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 5 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 52.4 | | | 135.0 | | 97.6 | 97.6 | 27.7 | 72.3 | |
| Effective Green, g (s) | | | 52.4 | | | 135.0 | | 97.6 | 97.6 | 27.7 | 72.3 | |
| Actuated g/C Ratio | | | 0.39 | | | 1.00 | | 0.72 | 0.72 | 0.21 | 0.54 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 1081 | | | 1591 | | 3676 | 1116 | 363 | 3431 | |
| v/s Ratio Prot | | | c0.39 | | | | | 0.15 | | c0.16 | c0.23 | |
| v/s Ratio Perm | | | | | | 0.23 | | | 0.12 | | | |
| v/c Ratio | | | 0.99 | | | 0.23 | | 0.21 | 0.17 | 0.78 | 0.42 | |
| Uniform Delay, d1 | | | 41.1 | | | 0.0 | | 6.1 | 5.9 | 50.7 | 18.8 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.10 | 0.54 | |
| Incremental Delay, d2 | | | 25.5 | | | 0.3 | | 0.1 | 0.3 | 0.9 | 0.0 | |
| Delay (s) | | | 66.7 | | | 0.3 | | 6.3 | 6.2 | 56.5 | 10.2 | |
| Level of Service | | | E | | | A | | A | A | E | B | |
| Approach Delay (s) | | 66.7 | | | 0.3 | | | 6.3 | | | 17.7 | |
| Approach LOS | | E | | | A | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 26.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 135.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 64.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 35.1 |
| Intersection LOS | E |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 206 | 183 | 0 | 397 | 63 | 0 | 71 | 285 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 251 | 223 | 0 | 484 | 77 | 0 | 87 | 348 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 1 | 0 | 1 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 1 | 2 |
| HCM Control Delay | 16.9 | 57.1 | 26.5 |
| HCM LOS | C | F | D |

| Lane | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 20% |
| Vol Thru, % | 0% | 100% | 86% | 0% |
| Vol Right, % | 0% | 0% | 14% | 80% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 206 | 183 | 460 | 356 |
| LT Vol | 0 | 183 | 397 | 0 |
| Through Vol | 0 | 0 | 63 | 285 |
| RT Vol | 206 | 0 | 0 | 71 |
| Lane Flow Rate | 251 | 223 | 561 | 434 |
| Geometry Grp | 7 | 7 | 5 | 2 |
| Degree of Util (X) | 0.528 | 0.437 | 0.977 | 0.759 |
| Departure Headway (Hd) | 7.568 | 7.054 | 6.27 | 6.294 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 477 | 509 | 578 | 573 |
| Service Time | 5.32 | 4.807 | 4.311 | 4.33 |
| HCM Lane V/C Ratio | 0.526 | 0.438 | 0.971 | 0.757 |
| HCM Control Delay | 18.5 | 15.2 | 57.1 | 26.5 |
| HCM Lane LOS | C | C | F | D |
| HCM 95th-tile Q | 3 | 2.2 | 13.7 | 6.8 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 5 | 247 | 2 | 2 | 421 | 89 | 1 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Yield | Yield | Yield |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 5 | 263 | 2 | 2 | 448 | 95 | 1 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 545 | 0 | 0 | 265 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 1024 | - | - | 1299 | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Platoon blocked, % | | - | - | | - | - |
| Mov Cap-1 Maneuver | 1022 | - | - | 1297 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 0.2 | 0 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1022 | - | - | 1297 | - | - | 361 |
| HCM Lane V/C Ratio | 0.005 | - | - | 0.002 | - | - | 0.374 |
| HCM Control Delay (s) | 8.5 | 0 | - | 7.8 | 0 | - | 20.8 |
| HCM Lane LOS | A | A | - | A | A | - | C |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - | - | 1.7 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 89 | 0 | 38 |
| Conflicting Peds, #/hr | 0 | 0 | 2 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 95 | 0 | 40 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 775 | 777 | 499 |
| Stage 1 | 501 | 501 | - |
| Stage 2 | 274 | 276 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 315 | 328 | 572 |
| Stage 1 | 552 | 543 | - |
| Stage 2 | 732 | 682 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 312 | 325 | 570 |
| Mov Cap-2 Maneuver | 312 | 325 | - |
| Stage 1 | 548 | 541 | - |
| Stage 2 | 726 | 678 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 20.8 |
| HCM LOS | C |

| Minor Lane/Major Mvmt |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 195 | 105 | 52 | 220 | 200 | 188 | 43 | 420 | 116 | 118 | 1089 | 349 |
| 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 | | 0.99 | 1.00 | | 0.99 | 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 | 1845 | 1851 | 1900 | 1863 | 1863 | 1863 | 1810 | 1810 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 212 | 114 | 4 | 239 | 217 | 15 | 47 | 457 | 63 | 128 | 1184 | 182 |
| Adj No. of Lanes | 2 | 2 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 305 | 398 | 14 | 332 | 431 | 191 | 59 | 2932 | 736 | 206 | 2524 | 776 |
| Arrive On Green | 0.09 | 0.11 | 0.11 | 0.10 | 0.12 | 0.12 | 0.03 | 0.47 | 0.47 | 0.06 | 0.50 | 0.50 |
| Sat Flow, veh/h | 3408 | 3465 | 121 | 3442 | 3539 | 1564 | 1723 | 6225 | 1563 | 3442 | 5085 | 1563 |
| Grp Volume(v), veh/h | 212 | 58 | 60 | 239 | 217 | 15 | 47 | 457 | 63 | 128 | 1184 | 182 |
| Grp Sat Flow(s),veh/h/ln | 1704 | 1758 | 1827 | 1721 | 1770 | 1564 | 1723 | 1556 | 1563 | 1721 | 1695 | 1563 |
| Q Serve(g_s), s | 5.3 | 2.6 | 2.6 | 5.9 | 5.0 | 0.7 | 2.4 | 3.7 | 1.9 | 3.2 | 13.3 | 5.8 |
| Cycle Q Clear(g_c), s | 5.3 | 2.6 | 2.6 | 5.9 | 5.0 | 0.7 | 2.4 | 3.7 | 1.9 | 3.2 | 13.3 | 5.8 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 305 | 202 | 210 | 332 | 431 | 191 | 59 | 2932 | 736 | 206 | 2524 | 776 |
| V/C Ratio(X) | 0.69 | 0.29 | 0.29 | 0.72 | 0.50 | 0.08 | 0.79 | 0.16 | 0.09 | 0.62 | 0.47 | 0.23 |
| Avail Cap(c_a), veh/h | 938 | 750 | 779 | 750 | 1712 | 756 | 316 | 2932 | 736 | 789 | 2524 | 776 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.6 | 35.3 | 35.3 | 38.3 | 35.8 | 34.0 | 41.8 | 13.2 | 12.7 | 40.0 | 14.4 | 12.5 |
| Incr Delay (d2), s/veh | 2.8 | 0.8 | 0.7 | 2.9 | 0.9 | 0.2 | 20.6 | 0.1 | 0.2 | 3.1 | 0.6 | 0.7 |
| 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 | 2.6 | 1.3 | 1.4 | 2.9 | 2.5 | 0.3 | 1.5 | 1.6 | 0.9 | 1.6 | 6.4 | 2.6 |
| LnGrp Delay(d),s/veh | 41.4 | 36.1 | 36.1 | 41.2 | 36.7 | 34.1 | 62.4 | 13.3 | 12.9 | 43.1 | 15.1 | 13.2 |
| LnGrp LOS | D | D | D | D | D | C | E | B | B | D | B | B |
| Approach Vol, veh/h | | 330 | | | 471 | | | 567 | | | 1494 | |
| Approach Delay, s/veh | | 39.5 | | | 38.9 | | | 17.3 | | | 17.2 | |
| Approach LOS | | D | | | D | | | 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 | 10.2 | 46.8 | 14.4 | 15.8 | 8.0 | 49.0 | 13.8 | 16.4 |
| Change Period (Y+Rc), s | 5.0 | 5.7 | 6.0 | * 5.8 | 5.0 | 5.7 | 6.0 | 5.8 |
| Max Green Setting (Gmax), s | 20.0 | 39.3 | 19.0 | * 37 | 16.0 | 43.3 | 24.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 5.2 | 5.7 | 7.9 | 4.6 | 4.4 | 15.3 | 7.3 | 7.0 |
| Green Ext Time (p_c), s | 0.3 | 15.8 | 0.6 | 2.0 | 0.1 | 14.5 | 0.6 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.4 |
| HCM 2010 LOS | C |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 29 | 205 | 97 | 1 | 656 | 10 | 77 | 4 | 0 | 5 | 4 | 48 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 32 | 225 | 51 | 1 | 721 | 4 | 88 | 0 | 0 | 4 | 5 | -1 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 37 | 2665 | 830 | 4 | 2562 | 788 | 168 | 0 | 75 | 8 | 8 | 7 |
| Arrive On Green | 0.02 | 0.52 | 0.52 | 0.00 | 0.50 | 0.50 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 32 | 225 | 51 | 1 | 721 | 4 | 88 | 0 | 0 | 4 | 5 | -1 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 0.8 | 1.0 | 0.7 | 0.0 | 3.9 | 0.1 | 1.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.8 | 1.0 | 0.7 | 0.0 | 3.9 | 0.1 | 1.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 37 | 2665 | 830 | 4 | 2562 | 788 | 168 | 0 | 75 | 8 | 8 | 7 |
| V/C Ratio(X) | 0.87 | 0.08 | 0.06 | 0.27 | 0.28 | 0.01 | 0.52 | 0.00 | 0.00 | 0.50 | 0.60 | -0.14 |
| Avail Cap(c_a), veh/h | 939 | 4200 | 1308 | 939 | 4308 | 1325 | 1879 | 0 | 838 | 939 | 986 | 838 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 23.1 | 5.6 | 5.5 | 23.6 | 6.8 | 5.8 | 22.0 | 0.0 | 0.0 | 23.5 | 23.5 | 0.0 |
| Incr Delay (d2), s/veh | 19.6 | 0.1 | 0.1 | 13.4 | 0.3 | 0.0 | 0.9 | 0.0 | 0.0 | 16.9 | 22.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.5 | 0.4 | 0.0 | 1.9 | 0.0 | 0.6 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 42.7 | 5.6 | 5.6 | 36.9 | 7.0 | 5.8 | 22.9 | 0.0 | 0.0 | 40.4 | 46.1 | 0.0 |
| LnGrp LOS | D | A | A | D | A | A | C | | | D | D | |
| Approach Vol, veh/h | | 308 | | | 726 | | | 88 | | | 8 | |
| Approach Delay, s/veh | | 9.5 | | | 7.1 | | | 22.9 | | | 49.0 | |
| Approach LOS | | A | | | A | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 5.5 | 30.3 | | 4.7 | 4.5 | 31.2 | | 6.7 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 40.0 | | 25.0 | 25.0 | * 39 | | 25.0 |
| Max Q Clear Time (g_c+I1), s | 2.8 | 5.9 | | 2.1 | 2.0 | 3.0 | | 3.1 |
| Green Ext Time (p_c), s | 0.0 | 17.9 | | 0.0 | 0.0 | 18.4 | | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 9.3 |
| 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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 52 | 136 | 22 | 30 | 507 | 17 | 76 | 6 | 5 | 31 | 17 | 84 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 59 | 155 | 9 | 34 | 576 | 5 | 86 | 7 | 0 | 35 | 19 | 2 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 101 | 1965 | 612 | 67 | 1869 | 582 | 203 | 173 | 147 | 110 | 68 | 7 |
| Arrive On Green | 0.06 | 0.39 | 0.39 | 0.04 | 0.37 | 0.37 | 0.11 | 0.09 | 0.00 | 0.06 | 0.04 | 0.04 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1657 | 174 |
| Grp Volume(v), veh/h | 59 | 155 | 9 | 34 | 576 | 5 | 86 | 7 | 0 | 35 | 0 | 21 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1832 |
| Q Serve(g_s), s | 1.5 | 0.9 | 0.2 | 0.9 | 3.8 | 0.1 | 2.1 | 0.2 | 0.0 | 0.9 | 0.0 | 0.5 |
| Cycle Q Clear(g_c), s | 1.5 | 0.9 | 0.2 | 0.9 | 3.8 | 0.1 | 2.1 | 0.2 | 0.0 | 0.9 | 0.0 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 101 | 1965 | 612 | 67 | 1869 | 582 | 203 | 173 | 147 | 110 | 0 | 75 |
| V/C Ratio(X) | 0.58 | 0.08 | 0.01 | 0.50 | 0.31 | 0.01 | 0.42 | 0.04 | 0.00 | 0.32 | 0.00 | 0.28 |
| Avail Cap(c_a), veh/h | 933 | 7273 | 2265 | 933 | 7380 | 2298 | 933 | 1567 | 1332 | 933 | 0 | 1541 |
| 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 | 21.9 | 9.2 | 9.0 | 22.4 | 10.7 | 9.5 | 19.6 | 19.6 | 0.0 | 21.3 | 0.0 | 22.1 |
| Incr Delay (d2), s/veh | 2.0 | 0.0 | 0.0 | 2.2 | 0.2 | 0.0 | 1.4 | 0.1 | 0.0 | 1.6 | 0.0 | 2.0 |
| 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 | 0.8 | 0.4 | 0.1 | 0.5 | 1.8 | 0.0 | 1.1 | 0.1 | 0.0 | 0.5 | 0.0 | 0.3 |
| LnGrp Delay(d),s/veh | 23.9 | 9.3 | 9.0 | 24.6 | 10.9 | 9.6 | 21.0 | 19.7 | 0.0 | 22.9 | 0.0 | 24.2 |
| LnGrp LOS | C | A | A | C | B | A | C | B | | C | | C |
| Approach Vol, veh/h | | 223 | | | 615 | | | 93 | | | 56 | |
| Approach Delay, s/veh | | 13.1 | | | 11.7 | | | 20.9 | | | 23.4 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 6.3 | 24.9 | 9.9 | 6.4 | 7.2 | 24.0 | 7.5 | 8.9 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | * 68 | 25.0 | 40.0 | 25.0 | 69.0 | 25.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 2.9 | 4.1 | 2.5 | 3.5 | 5.8 | 2.9 | 2.2 |
| Green Ext Time (p_c), s | 0.0 | 11.7 | 0.2 | 0.1 | 0.1 | 11.6 | 0.1 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 13.5 |
| HCM 2010 LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 97 | 323 | 55 | 219 | 168 | 109 | 144 | 1322 | 420 | 164 | 1297 | 45 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 101 | 336 | 0 | 228 | 175 | 0 | 150 | 1377 | 0 | 171 | 1351 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 159 | 673 | 209 | 304 | 887 | 276 | 211 | 2705 | 842 | 232 | 2737 | 852 |
| Arrive On Green | 0.05 | 0.13 | 0.00 | 0.09 | 0.17 | 0.00 | 0.06 | 0.53 | 0.00 | 0.07 | 0.54 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 101 | 336 | 0 | 228 | 175 | 0 | 150 | 1377 | 0 | 171 | 1351 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 3.1 | 6.7 | 0.0 | 7.0 | 3.2 | 0.0 | 4.7 | 18.9 | 0.0 | 5.3 | 18.2 | 0.0 |
| Cycle Q Clear(g_c), s | 3.1 | 6.7 | 0.0 | 7.0 | 3.2 | 0.0 | 4.7 | 18.9 | 0.0 | 5.3 | 18.2 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 159 | 673 | 209 | 304 | 887 | 276 | 211 | 2705 | 842 | 232 | 2737 | 852 |
| V/C Ratio(X) | 0.64 | 0.50 | 0.00 | 0.75 | 0.20 | 0.00 | 0.71 | 0.51 | 0.00 | 0.74 | 0.49 | 0.00 |
| Avail Cap(c_a), veh/h | 692 | 1808 | 563 | 692 | 1808 | 563 | 692 | 2705 | 842 | 692 | 2737 | 852 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 51.0 | 43.9 | 0.0 | 48.5 | 38.4 | 0.0 | 50.2 | 16.4 | 0.0 | 49.8 | 15.8 | 0.0 |
| Incr Delay (d2), s/veh | 1.6 | 1.0 | 0.0 | 3.7 | 0.2 | 0.0 | 1.7 | 0.7 | 0.0 | 1.7 | 0.6 | 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 | 1.5 | 3.2 | 0.0 | 3.5 | 1.5 | 0.0 | 2.3 | 9.0 | 0.0 | 2.6 | 8.7 | 0.0 |
| LnGrp Delay(d),s/veh | 52.6 | 44.9 | 0.0 | 52.2 | 38.6 | 0.0 | 51.8 | 17.0 | 0.0 | 51.5 | 16.4 | 0.0 |
| LnGrp LOS | D | D | | D | D | | D | B | | D | B | |
| Approach Vol, veh/h | | 437 | | | 403 | | | 1527 | | | 1522 | |
| Approach Delay, s/veh | | 46.7 | | | 46.3 | | | 20.5 | | | 20.4 | |
| Approach LOS | | D | | | D | | | C | | | 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 | 11.9 | 114.3 | 9.5 | 24.3 | 11.2 | 115.0 | 14.1 | 19.7 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 21.9 | 57.9 | 21.9 | 38.7 | 21.9 | 57.9 | 21.9 | 38.7 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 20.9 | 5.1 | 5.2 | 6.7 | 20.2 | 9.0 | 8.7 |
| Green Ext Time (p_c), s | 0.1 | 36.0 | 0.1 | 5.6 | 0.1 | 36.7 | 0.6 | 5.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 26.0 |
| HCM 2010 LOS | C |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.7 |
| Intersection LOS | B |

| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 102 | 22 | 31 | 0 | 2 | 17 | 10 | 0 | 28 | 326 | 7 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 112 | 24 | 34 | 0 | 2 | 19 | 11 | 0 | 31 | 358 | 8 |
| Number of Lanes | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 3 | 3 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 3 | 3 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 3 | 3 | 1 |
| HCM Control Delay | 10 | 9.7 | 11.4 |
| HCM LOS | A | A | B |

| Lane | NBLn1 | NBLn2 | NBLn3 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 100% | 65% | 0% | 7% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 94% | 0% | 35% | 0% | 59% | 0% | 100% | 36% |
| Vol Right, % | 0% | 0% | 6% | 0% | 0% | 100% | 34% | 0% | 0% | 64% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 28 | 217 | 116 | 61 | 63 | 31 | 29 | 10 | 99 | 140 |
| LT Vol | 0 | 217 | 109 | 0 | 22 | 0 | 17 | 0 | 99 | 50 |
| Through Vol | 0 | 0 | 7 | 0 | 0 | 31 | 10 | 0 | 0 | 90 |
| RT Vol | 28 | 0 | 0 | 61 | 41 | 0 | 2 | 10 | 0 | 0 |
| Lane Flow Rate | 31 | 239 | 127 | 67 | 69 | 34 | 32 | 11 | 109 | 153 |
| Geometry Grp | 8 | 8 | 8 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.054 | 0.389 | 0.205 | 0.126 | 0.126 | 0.052 | 0.058 | 0.02 | 0.186 | 0.242 |
| Departure Headway (Hd) | 6.366 | 5.863 | 5.82 | 6.74 | 6.565 | 5.54 | 6.57 | 6.623 | 6.12 | 5.665 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 563 | 614 | 618 | 533 | 547 | 647 | 545 | 541 | 587 | 634 |
| Service Time | 4.095 | 3.592 | 3.549 | 4.472 | 4.296 | 3.271 | 4.312 | 4.355 | 3.851 | 3.397 |
| HCM Lane V/C Ratio | 0.055 | 0.389 | 0.206 | 0.126 | 0.126 | 0.053 | 0.059 | 0.02 | 0.186 | 0.241 |
| HCM Control Delay | 9.5 | 12.3 | 10.1 | 10.4 | 10.2 | 8.6 | 9.7 | 9.5 | 10.3 | 10.2 |
| HCM Lane LOS | A | B | B | B | B | A | A | A | B | B |
| HCM 95th-tile Q | 0.2 | 1.8 | 0.8 | 0.4 | 0.4 | 0.2 | 0.2 | 0.1 | 0.7 | 0.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | |
| Intersection LOS | |

| Movement | SBU | SBL | SBT | SBR |
|---|---|---|---|---|
| Vol, veh/h | 0 | 10 | 149 | 90 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 164 | 99 |
| Number of Lanes | 0 | 1 | 2 | 0 |

| Approach | SB |
|---|---|
| Opposing Approach | NB |
| Opposing Lanes | 3 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 1 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 10.2 |
| HCM LOS | B |

| Lane |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 457 | 721 | 41 | 25 | 286 | 52 | 99 | 71 | 60 | 80 | 23 | 178 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 508 | 801 | 19 | 28 | 318 | 0 | 94 | 101 | 4 | 89 | 26 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 626 | 2861 | 890 | 53 | 2014 | 627 | 161 | 169 | 143 | 203 | 110 | 94 |
| Arrive On Green | 0.18 | 0.56 | 0.56 | 0.02 | 0.40 | 0.00 | 0.09 | 0.09 | 0.09 | 0.06 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1582 | 3442 | 5085 | 1583 | 1774 | 1863 | 1573 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 508 | 801 | 19 | 28 | 318 | 0 | 94 | 101 | 4 | 89 | 26 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1582 | 1721 | 1695 | 1583 | 1774 | 1863 | 1573 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 9.9 | 5.7 | 0.4 | 0.6 | 2.8 | 0.0 | 3.6 | 3.6 | 0.2 | 1.7 | 0.9 | 0.0 |
| Cycle Q Clear(g_c), s | 9.9 | 5.7 | 0.4 | 0.6 | 2.8 | 0.0 | 3.6 | 3.6 | 0.2 | 1.7 | 0.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 626 | 2861 | 890 | 53 | 2014 | 627 | 161 | 169 | 143 | 203 | 110 | 94 |
| V/C Ratio(X) | 0.81 | 0.28 | 0.02 | 0.52 | 0.16 | 0.00 | 0.58 | 0.60 | 0.03 | 0.44 | 0.24 | 0.00 |
| Avail Cap(c_a), veh/h | 1232 | 4952 | 1540 | 1232 | 4952 | 1542 | 635 | 667 | 563 | 1971 | 1067 | 907 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 27.4 | 7.9 | 6.8 | 34.1 | 13.6 | 0.0 | 30.5 | 30.5 | 28.9 | 31.7 | 31.3 | 0.0 |
| Incr Delay (d2), s/veh | 1.0 | 0.1 | 0.0 | 2.9 | 0.1 | 0.0 | 1.3 | 1.3 | 0.0 | 0.6 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.7 | 2.7 | 0.2 | 0.3 | 1.3 | 0.0 | 1.8 | 1.9 | 0.1 | 0.8 | 0.5 | 0.0 |
| LnGrp Delay(d),s/veh | 28.4 | 8.1 | 6.8 | 37.1 | 13.7 | 0.0 | 31.7 | 31.8 | 29.0 | 32.3 | 31.8 | 0.0 |
| LnGrp LOS | C | A | A | D | B | | C | C | C | C | C | |
| Approach Vol, veh/h | | 1328 | | | 346 | | | 199 | | | 115 | |
| Approach Delay, s/veh | | 15.8 | | | 15.6 | | | 31.7 | | | 32.2 | |
| 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 | 5.6 | 44.8 | | 10.8 | 17.2 | 33.2 | | 8.6 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 68.0 | | 25.0 | 25.0 | 68.0 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 2.6 | 7.7 | | 5.6 | 11.9 | 4.8 | | 3.7 |
| Green Ext Time (p_c), s | 0.0 | 22.5 | | 0.5 | 0.8 | 22.8 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.3 |
| HCM 2010 LOS | B |

**Notes**

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 165 | 330 | 588 | 413 | 125 | 137 | 584 | 1490 | 591 | 182 | 1260 | 163 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 172 | 344 | 284 | 430 | 130 | 0 | 608 | 1552 | 0 | 190 | 1312 | 0 |
| Adj No. of Lanes | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 230 | 736 | 329 | 494 | 1439 | 448 | 685 | 2155 | 671 | 249 | 1510 | 470 |
| Arrive On Green | 0.07 | 0.21 | 0.21 | 0.14 | 0.28 | 0.00 | 0.07 | 0.14 | 0.00 | 0.07 | 0.30 | 0.00 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 172 | 344 | 284 | 430 | 130 | 0 | 608 | 1552 | 0 | 190 | 1312 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 6.2 | 10.8 | 22.0 | 15.4 | 2.4 | 0.0 | 22.3 | 37.1 | 0.0 | 6.9 | 31.1 | 0.0 |
| Cycle Q Clear(g_c), s | 6.2 | 10.8 | 22.0 | 15.4 | 2.4 | 0.0 | 22.3 | 37.1 | 0.0 | 6.9 | 31.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 230 | 736 | 329 | 494 | 1439 | 448 | 685 | 2155 | 671 | 249 | 1510 | 470 |
| V/C Ratio(X) | 0.75 | 0.47 | 0.86 | 0.87 | 0.09 | 0.00 | 0.89 | 0.72 | 0.00 | 0.76 | 0.87 | 0.00 |
| Avail Cap(c_a), veh/h | 809 | 810 | 362 | 818 | 1439 | 448 | 1026 | 2155 | 671 | 1026 | 1740 | 542 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.49 | 0.49 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 58.3 | 44.2 | 48.6 | 53.4 | 33.5 | 0.0 | 58.0 | 47.5 | 0.0 | 57.9 | 42.3 | 0.0 |
| Incr Delay (d2), s/veh | 1.8 | 1.1 | 20.7 | 3.0 | 0.1 | 0.0 | 2.4 | 1.0 | 0.0 | 1.8 | 5.4 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 5.4 | 11.5 | 7.6 | 1.1 | 0.0 | 10.9 | 17.7 | 0.0 | 3.3 | 15.3 | 0.0 |
| LnGrp Delay(d),s/veh | 60.1 | 45.3 | 69.3 | 56.4 | 33.6 | 0.0 | 60.4 | 48.5 | 0.0 | 59.7 | 47.7 | 0.0 |
| LnGrp LOS | E | D | E | E | C | | E | D | | E | D | |
| Approach Vol, veh/h | | 800 | | | 560 | | | 2160 | | | 1502 | |
| Approach Delay, s/veh | | 57.0 | | | 51.1 | | | 51.9 | | | 49.3 | |
| Approach LOS | | E | | | D | | | D | | | 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 | 13.7 | 92.0 | 13.0 | 41.3 | 62.7 | 43.1 | 22.6 | 31.7 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 37.9 | 43.5 | 29.9 | 29.1 | 37.9 | 43.5 | 29.9 | 29.1 |
| Max Q Clear Time (g_c+I1), s | 8.9 | 39.1 | 8.2 | 4.4 | 24.3 | 33.1 | 17.4 | 24.0 |
| Green Ext Time (p_c), s | 0.3 | 4.4 | 0.3 | 8.6 | 1.0 | 4.7 | 0.7 | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 51.8 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 14.2 |
| Intersection LOS | B |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 1 | 360 | 116 | 0 | 57 | 7 | 2 | 4 | 138 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1 | 419 | 135 | 0 | 66 | 8 | 2 | 5 | 160 |
| Number of Lanes | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 2 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 3 | 3 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 3 | 0 | 3 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 3 | 3 |
| HCM Control Delay | 16.4 | 9.3 | 8.9 |
| HCM LOS | C | A | A |

| Lane | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 100% | 100% | 100% | 73% | 0% | 0% | 0% |
| Vol Right, % | 0% | 0% | 0% | 0% | 0% | 27% | 0% | 100% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 361 | 58 | 58 | 0 | 38 | 26 | 6 | 69 | 69 |
| LT Vol | 0 | 58 | 58 | 0 | 38 | 19 | 0 | 0 | 0 |
| Through Vol | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 69 | 69 |
| RT Vol | 361 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 |
| Lane Flow Rate | 420 | 67 | 67 | 0 | 44 | 30 | 7 | 80 | 80 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 |
| Degree of Util (X) | 0.661 | 0.097 | 0.097 | 0 | 0.075 | 0.05 | 0.013 | 0.12 | 0.12 |
| Departure Headway (Hd) | 5.665 | 5.163 | 5.163 | 6.137 | 6.137 | 5.948 | 6.577 | 5.376 | 5.376 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 634 | 689 | 689 | 0 | 578 | 596 | 542 | 663 | 663 |
| Service Time | 3.435 | 2.934 | 2.934 | 3.936 | 3.936 | 3.746 | 4.345 | 3.143 | 3.143 |
| HCM Lane V/C Ratio | 0.662 | 0.097 | 0.097 | 0 | 0.076 | 0.05 | 0.013 | 0.121 | 0.121 |
| HCM Control Delay | 18.9 | 8.5 | 8.5 | 8.9 | 9.4 | 9.1 | 9.4 | 8.9 | 8.9 |
| HCM Lane LOS | C | A | A | N | A | A | A | A | A |
| HCM 95th-tile Q | 4.9 | 0.3 | 0.3 | 0 | 0.2 | 0.2 | 0 | 0.4 | 0.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 420 | 0 | 2245 | 105 | 199 | 1410 | 728 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.98 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4698 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4698 | 1362 |
| Peak-hour factor, 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 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 438 | 0 | 2339 | 109 | 207 | 1469 | 758 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 20 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 401 | 0 | 2339 | 89 | 207 | 1727 | 500 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 47.0 | | 92.4 | 92.4 | 47.0 | 160.0 | 160.0 |
| Effective Green, g (s) | | | | | | 47.0 | | 92.4 | 92.4 | 47.0 | 160.0 | 160.0 |
| Actuated g/C Ratio | | | | | | 0.29 | | 0.58 | 0.58 | 0.29 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 473 | | 2936 | 914 | 519 | 4698 | 1362 |
| v/s Ratio Prot | | | | | | c0.25 | | c0.46 | | 0.12 | 0.37 | |
| v/s Ratio Perm | | | | | | | | | 0.06 | | | 0.37 |
| v/c Ratio | | | | | | 0.85 | | 0.80 | 0.10 | 0.40 | 0.37 | 0.37 |
| Uniform Delay, d1 | | | | | | 53.1 | | 26.4 | 15.1 | 45.2 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 1.00 | 1.00 | 0.55 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 12.8 | | 2.3 | 0.2 | 0.1 | 0.1 | 0.4 |
| Delay (s) | | | | | | 65.9 | | 28.8 | 15.3 | 24.9 | 0.1 | 0.4 |
| Level of Service | | | | | | E | | C | B | C | A | A |
| Approach Delay (s) | | 0.0 | | | 65.9 | | | 28.2 | | | 2.3 | |
| Approach LOS | | A | | | E | | | C | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 160.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 78.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 61 | 1003 | 1347 | 113 | 0 | 1410 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 64 | 1003 | 1403 | 0 | 0 | 1469 |
| Adj No. of Lanes | 2 | 2 | 2 | 1 | 0 | 3 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 1270 | 1028 | 1912 | 812 | 0 | 2609 |
| Arrive On Green | 0.37 | 0.37 | 0.51 | 0.00 | 0.00 | 0.51 |
| Sat Flow, veh/h | 3442 | 2787 | 3725 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 64 | 1003 | 1403 | 0 | 0 | 1469 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1863 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 1.0 | 28.9 | 23.9 | 0.0 | 0.0 | 16.1 |
| Cycle Q Clear(g_c), s | 1.0 | 28.9 | 23.9 | 0.0 | 0.0 | 16.1 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 1270 | 1028 | 1912 | 812 | 0 | 2609 |
| V/C Ratio(X) | 0.05 | 0.98 | 0.73 | 0.00 | 0.00 | 0.56 |
| Avail Cap(c_a), veh/h | 1270 | 1028 | 2290 | 973 | 0 | 3126 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.5 | 25.3 | 15.5 | 0.0 | 0.0 | 13.6 |
| Incr Delay (d2), s/veh | 0.0 | 22.2 | 0.7 | 0.0 | 0.0 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 14.2 | 12.3 | 0.0 | 0.0 | 7.5 |
| LnGrp Delay(d),s/veh | 16.5 | 47.5 | 16.2 | 0.0 | 0.0 | 13.6 |
| LnGrp LOS | B | D | B | | | B |
| Approach Vol, veh/h | 1067 | | 1403 | | | 1469 |
| Approach Delay, s/veh | 45.6 | | 16.2 | | | 13.6 |
| Approach LOS | D | | B | | | B |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 47.0 | | | | 47.0 | | 34.3 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 50.0 | | | | 50.0 | | 30.0 |
| Max Q Clear Time (g_c+I1), s | | 25.9 | | | | 18.1 | | 30.9 |
| Green Ext Time (p_c), s | | 15.8 | | | | 18.8 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.2 |
| HCM 2010 LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 1104 | 0 | 53 | 0 | 0 | 0 | 0 | 356 | 175 | 0 | 280 | 1191 |
| 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 | 1115 | 0 | 28 | | | | 0 | 360 | 0 | 0 | 283 | 0 |
| Adj No. of Lanes | 2 | 0 | 1 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1445 | 0 | 665 | | | | 0 | 906 | 406 | 0 | 954 | 406 |
| Arrive On Green | 0.42 | 0.00 | 0.42 | | | | 0.00 | 0.26 | 0.00 | 0.00 | 0.26 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 1583 | | | | 0 | 3632 | 1583 | 0 | 3725 | 1583 |
| Grp Volume(v), veh/h | 1115 | 0 | 28 | | | | 0 | 360 | 0 | 0 | 283 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1583 | | | | 0 | 1770 | 1583 | 0 | 1863 | 1583 |
| Q Serve(g_s), s | 8.2 | 0.0 | 0.3 | | | | 0.0 | 2.5 | 0.0 | 0.0 | 1.8 | 0.0 |
| Cycle Q Clear(g_c), s | 8.2 | 0.0 | 0.3 | | | | 0.0 | 2.5 | 0.0 | 0.0 | 1.8 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1445 | 0 | 665 | | | | 0 | 906 | 406 | 0 | 954 | 406 |
| V/C Ratio(X) | 0.77 | 0.00 | 0.04 | | | | 0.00 | 0.40 | 0.00 | 0.00 | 0.30 | 0.00 |
| Avail Cap(c_a), veh/h | 2905 | 0 | 1336 | | | | 0 | 5377 | 2405 | 0 | 5660 | 2405 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.4 | 0.0 | 5.1 | | | | 0.0 | 9.1 | 0.0 | 0.0 | 8.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 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 | 3.8 | 0.0 | 0.1 | | | | 0.0 | 1.2 | 0.0 | 0.0 | 0.9 | 0.0 |
| LnGrp Delay(d),s/veh | 7.7 | 0.0 | 5.1 | | | | 0.0 | 9.2 | 0.0 | 0.0 | 8.9 | 0.0 |
| LnGrp LOS | A | | A | | | | | A | | | A | |
| Approach Vol, veh/h | | 1143 | | | | | | 360 | | | 283 | |
| Approach Delay, s/veh | | 7.6 | | | | | | 9.2 | | | 8.9 | |
| Approach LOS | | A | | | | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 12.9 | | 16.7 | | 12.9 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 45.0 | | * 25 | | 45.0 | | |
| Max Q Clear Time (g_c+I1), s | | 4.5 | | 10.2 | | 3.8 | | |
| Green Ext Time (p_c), s | | 2.6 | | 2.2 | | 2.6 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 8.2 |
| 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 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 167 | 53 | 321 | 141 | 84 | 93 | 1049 | 1369 | 304 | 52 | 512 | 397 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 170 | 54 | 102 | 162 | 61 | 7 | 1070 | 1397 | 298 | 53 | 522 | 156 |
| Adj No. of Lanes | 0 | 1 | 1 | 2 | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 1 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 199 | 63 | 231 | 312 | 145 | 17 | 1385 | 1568 | 328 | 125 | 725 | 308 |
| Arrive On Green | 0.15 | 0.15 | 0.15 | 0.09 | 0.09 | 0.09 | 0.40 | 0.54 | 0.54 | 0.07 | 0.19 | 0.19 |
| Sat Flow, veh/h | 1362 | 433 | 1583 | 3548 | 1641 | 188 | 3442 | 2914 | 609 | 1774 | 3725 | 1583 |
| Grp Volume(v), veh/h | 224 | 0 | 102 | 162 | 0 | 68 | 1070 | 837 | 858 | 53 | 522 | 156 |
| Grp Sat Flow(s),veh/h/ln | 1795 | 0 | 1583 | 1774 | 0 | 1830 | 1721 | 1770 | 1754 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 13.8 | 0.0 | 6.7 | 5.0 | 0.0 | 4.0 | 30.6 | 47.1 | 50.2 | 3.3 | 14.9 | 10.0 |
| Cycle Q Clear(g_c), s | 13.8 | 0.0 | 6.7 | 5.0 | 0.0 | 4.0 | 30.6 | 47.1 | 50.2 | 3.3 | 14.9 | 10.0 |
| Prop In Lane | 0.76 | | 1.00 | 1.00 | | 0.10 | 1.00 | | 0.35 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 262 | 0 | 231 | 312 | 0 | 161 | 1385 | 952 | 944 | 125 | 725 | 308 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.44 | 0.52 | 0.00 | 0.42 | 0.77 | 0.88 | 0.91 | 0.42 | 0.72 | 0.51 |
| Avail Cap(c_a), veh/h | 427 | 0 | 376 | 500 | 0 | 258 | 1476 | 952 | 944 | 219 | 725 | 308 |
| 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 | 47.3 | 0.0 | 44.3 | 49.5 | 0.0 | 49.1 | 29.4 | 23.0 | 23.7 | 50.6 | 42.8 | 40.9 |
| Incr Delay (d2), s/veh | 4.8 | 0.0 | 0.5 | 0.5 | 0.0 | 0.7 | 2.1 | 11.4 | 14.2 | 0.8 | 6.1 | 5.8 |
| 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 | 7.2 | 0.0 | 2.9 | 2.5 | 0.0 | 2.1 | 15.0 | 25.8 | 27.8 | 1.6 | 8.3 | 4.9 |
| LnGrp Delay(d),s/veh | 52.1 | 0.0 | 44.8 | 50.0 | 0.0 | 49.7 | 31.6 | 34.4 | 37.9 | 51.4 | 48.9 | 46.7 |
| LnGrp LOS | D | | D | D | | D | C | C | D | D | D | D |
| Approach Vol, veh/h | | 326 | | | 230 | | | 2765 | | | 731 | |
| Approach Delay, s/veh | | 49.8 | | | 49.9 | | | 34.4 | | | 48.6 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 12.0 | 88.8 | | 21.2 | 73.4 | 27.4 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 5.3 | * 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 14.0 | 61.1 | | 27.0 | 48.7 | * 22 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 52.2 | | 15.8 | 32.6 | 16.9 | | 7.0 |
| Green Ext Time (p_c), s | 0.0 | 7.3 | | 0.7 | 12.0 | 1.2 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 39.1 |
| HCM 2010 LOS | D |

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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 802 | 0 | 0 | 926 | 0 | 1795 | 730 | 207 | 767 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1548 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1548 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 0 | 0 | 818 | 0 | 0 | 945 | 0 | 1832 | 745 | 211 | 783 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 216 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 717 | 0 | 0 | 945 | 0 | 1832 | 529 | 211 | 783 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 4 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 28.4 | | | 68.0 | | 42.6 | 42.6 | 15.7 | 29.3 | |
| Effective Green, g (s) | | | 28.4 | | | 68.0 | | 42.6 | 42.6 | 15.7 | 29.3 | |
| Actuated g/C Ratio | | | 0.42 | | | 1.00 | | 0.63 | 0.63 | 0.23 | 0.43 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 1163 | | | 1591 | | 3185 | 969 | 408 | 2761 | |
| v/s Ratio Prot | | | 0.26 | | | | | 0.36 | | 0.12 | 0.12 | |
| v/s Ratio Perm | | | | | | c0.59 | | | 0.34 | | | |
| v/c Ratio | | | 0.62 | | | 0.59 | | 0.58 | 0.55 | 0.52 | 0.28 | |
| Uniform Delay, d1 | | | 15.5 | | | 0.0 | | 7.4 | 7.2 | 22.8 | 12.5 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.31 | 0.99 | |
| Incremental Delay, d2 | | | 0.7 | | | 1.6 | | 0.8 | 2.2 | 0.5 | 0.2 | |
| Delay (s) | | | 16.2 | | | 1.6 | | 8.2 | 9.4 | 30.5 | 12.6 | |
| Level of Service | | | B | | | A | | A | A | C | B | |
| Approach Delay (s) | | 16.2 | | | 1.6 | | | 8.5 | | | 16.4 | |
| Approach LOS | | B | | | A | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 68.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 66.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 35.1 |
| Intersection LOS | E |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 485 | 252 | 0 | 255 | 108 | 0 | 134 | 204 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 527 | 274 | 0 | 277 | 117 | 0 | 146 | 222 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 1 | 0 | 1 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 1 | 2 |
| HCM Control Delay | 48.7 | 21.2 | 20.5 |
| HCM LOS | E | C | C |

| Lane | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 40% |
| Vol Thru, % | 0% | 100% | 70% | 0% |
| Vol Right, % | 0% | 0% | 30% | 60% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 485 | 252 | 363 | 338 |
| LT Vol | 0 | 252 | 255 | 0 |
| Through Vol | 0 | 0 | 108 | 204 |
| RT Vol | 485 | 0 | 0 | 134 |
| Lane Flow Rate | 527 | 274 | 395 | 367 |
| Geometry Grp | 7 | 7 | 5 | 2 |
| Degree of Util (X) | 1 | 0.49 | 0.679 | 0.652 |
| Departure Headway (Hd) | 6.944 | 6.434 | 6.193 | 6.393 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 522 | 556 | 592 | 573 |
| Service Time | 4.726 | 4.216 | 4.164 | 4.36 |
| HCM Lane V/C Ratio | 1.01 | 0.493 | 0.667 | 0.64 |
| HCM Control Delay | 66 | 15.3 | 21.2 | 20.5 |
| HCM Lane LOS | F | C | C | C |
| HCM 95th-tile Q | 13.9 | 2.7 | 5.2 | 4.7 |

| Intersection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Int Delay, s/veh | 3.8 | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 2 | 384 | 0 | 0 | 354 | 212 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Yield | Yield | Yield |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 2 | 409 | 0 | 0 | 377 | 226 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 602 | 0 | 0 | 409 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 975 | - | - | 1150 | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Platoon blocked, % | | - | - | | - | - |
| Mov Cap-1 Maneuver | 975 | - | - | 1150 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 0 | 0 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 975 | - | - | 1150 | - | - | 269 |
| HCM Lane V/C Ratio | 0.002 | - | - | - | - | - | 0.51 |
| HCM Control Delay (s) | 8.7 | 0 | - | 0 | - | - | 31.5 |
| HCM Lane LOS | A | A | - | A | - | - | D |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - | - | 2.7 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 119 | 1 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 127 | 1 | 10 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 902 | 902 | 489 |
| Stage 1 | 489 | 489 | - |
| Stage 2 | 413 | 413 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 259 | 277 | 579 |
| Stage 1 | 561 | 549 | - |
| Stage 2 | 616 | 594 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 258 | 276 | 579 |
| Mov Cap-2 Maneuver | 258 | 276 | - |
| Stage 1 | 559 | 549 | - |
| Stage 2 | 614 | 592 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 31.5 |
| HCM LOS | D |

| Minor Lane/Major Mvmt |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 308 | 252 | 62 | 142 | 121 | 238 | 80 | 1061 | 315 | 318 | 443 | 235 |
| 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 | | 0.99 | 1.00 | | 0.99 | 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 | 1845 | 1856 | 1900 | 1863 | 1863 | 1863 | 1810 | 1810 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 335 | 274 | 49 | 154 | 132 | 18 | 87 | 1153 | 272 | 346 | 482 | 93 |
| Adj No. of Lanes | 2 | 2 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 429 | 481 | 85 | 231 | 361 | 159 | 111 | 2556 | 641 | 436 | 2403 | 738 |
| Arrive On Green | 0.13 | 0.16 | 0.16 | 0.07 | 0.10 | 0.10 | 0.06 | 0.41 | 0.41 | 0.13 | 0.47 | 0.47 |
| Sat Flow, veh/h | 3408 | 2992 | 528 | 3442 | 3539 | 1560 | 1723 | 6225 | 1562 | 3442 | 5085 | 1563 |
| Grp Volume(v), veh/h | 335 | 160 | 163 | 154 | 132 | 18 | 87 | 1153 | 272 | 346 | 482 | 93 |
| Grp Sat Flow(s),veh/h/ln | 1704 | 1763 | 1757 | 1721 | 1770 | 1560 | 1723 | 1556 | 1562 | 1721 | 1695 | 1563 |
| Q Serve(g_s), s | 9.1 | 8.0 | 8.2 | 4.2 | 3.3 | 1.0 | 4.8 | 12.8 | 11.9 | 9.3 | 5.3 | 3.2 |
| Cycle Q Clear(g_c), s | 9.1 | 8.0 | 8.2 | 4.2 | 3.3 | 1.0 | 4.8 | 12.8 | 11.9 | 9.3 | 5.3 | 3.2 |
| Prop In Lane | 1.00 | | 0.30 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 429 | 283 | 282 | 231 | 361 | 159 | 111 | 2556 | 641 | 436 | 2403 | 738 |
| V/C Ratio(X) | 0.78 | 0.56 | 0.58 | 0.67 | 0.37 | 0.11 | 0.78 | 0.45 | 0.42 | 0.79 | 0.20 | 0.13 |
| Avail Cap(c_a), veh/h | 855 | 685 | 683 | 683 | 1560 | 688 | 288 | 2556 | 641 | 719 | 2403 | 738 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.6 | 37.1 | 37.2 | 43.6 | 40.1 | 39.0 | 44.1 | 20.4 | 20.1 | 40.6 | 14.7 | 14.2 |
| Incr Delay (d2), s/veh | 3.1 | 1.8 | 1.9 | 3.3 | 0.6 | 0.3 | 11.1 | 0.6 | 2.0 | 3.3 | 0.2 | 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 | 4.5 | 4.0 | 4.1 | 2.1 | 1.7 | 0.4 | 2.6 | 5.6 | 5.5 | 4.6 | 2.5 | 1.5 |
| LnGrp Delay(d),s/veh | 43.7 | 38.8 | 39.0 | 46.9 | 40.7 | 39.4 | 55.2 | 21.0 | 22.2 | 43.9 | 14.9 | 14.5 |
| LnGrp LOS | D | D | D | D | D | D | E | C | C | D | B | B |
| Approach Vol, veh/h | | 658 | | | 304 | | | 1512 | | | 921 | |
| Approach Delay, s/veh | | 41.4 | | | 43.8 | | | 23.2 | | | 25.8 | |
| Approach LOS | | D | | | D | | | C | | | 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 | 17.1 | 45.0 | 12.4 | 21.2 | 11.2 | 50.9 | 18.0 | 15.6 |
| Change Period (Y+Rc), s | 5.0 | 5.7 | 6.0 | * 5.8 | 5.0 | 5.7 | 6.0 | 5.8 |
| Max Green Setting (Gmax), s | 20.0 | 39.3 | 19.0 | * 37 | 16.0 | 43.3 | 24.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 11.3 | 14.8 | 6.2 | 10.2 | 6.8 | 7.3 | 11.1 | 5.3 |
| Green Ext Time (p_c), s | 0.8 | 14.5 | 0.3 | 2.6 | 0.1 | 17.9 | 0.9 | 2.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 29.2 |
| HCM 2010 LOS | C |

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 57 | 628 | 414 | 7 | 325 | 15 | 315 | 46 | 20 | 17 | 17 | 29 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 61 | 675 | 188 | 8 | 349 | 5 | 374 | 0 | 3 | 18 | 18 | -1 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 76 | 2458 | 765 | 8 | 2263 | 696 | 519 | 0 | 232 | 35 | 36 | 31 |
| Arrive On Green | 0.04 | 0.48 | 0.48 | 0.00 | 0.44 | 0.44 | 0.15 | 0.00 | 0.15 | 0.02 | 0.02 | 0.00 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 61 | 675 | 188 | 8 | 349 | 5 | 374 | 0 | 3 | 18 | 18 | -1 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 2.0 | 4.6 | 4.0 | 0.3 | 2.4 | 0.1 | 5.8 | 0.0 | 0.1 | 0.6 | 0.6 | 0.0 |
| Cycle Q Clear(g_c), s | 2.0 | 4.6 | 4.0 | 0.3 | 2.4 | 0.1 | 5.8 | 0.0 | 0.1 | 0.6 | 0.6 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 76 | 2458 | 765 | 8 | 2263 | 696 | 519 | 0 | 232 | 35 | 36 | 31 |
| V/C Ratio(X) | 0.80 | 0.27 | 0.25 | 0.96 | 0.15 | 0.01 | 0.72 | 0.00 | 0.01 | 0.52 | 0.49 | -0.03 |
| Avail Cap(c_a), veh/h | 767 | 3431 | 1068 | 767 | 3519 | 1082 | 1535 | 0 | 685 | 767 | 806 | 685 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 27.4 | 8.9 | 8.8 | 28.8 | 9.6 | 8.9 | 23.5 | 0.0 | 21.1 | 28.1 | 28.1 | 0.0 |
| Incr Delay (d2), s/veh | 6.9 | 0.2 | 0.6 | 76.8 | 0.1 | 0.0 | 0.7 | 0.0 | 0.0 | 4.4 | 3.8 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 2.2 | 1.9 | 0.3 | 1.1 | 0.0 | 2.9 | 0.0 | 0.0 | 0.3 | 0.3 | 0.0 |
| LnGrp Delay(d),s/veh | 34.4 | 9.1 | 9.4 | 105.5 | 9.7 | 8.9 | 24.3 | 0.0 | 21.1 | 32.5 | 31.9 | 0.0 |
| LnGrp LOS | C | A | A | F | A | A | C | | C | C | C | |
| Approach Vol, veh/h | | 924 | | | 362 | | | 377 | | | 35 | |
| Approach Delay, s/veh | | 10.8 | | | 11.8 | | | 24.2 | | | 33.1 | |
| 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 | 7.0 | 32.2 | | 5.6 | 4.8 | 34.4 | | 13.0 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 40.0 | | 25.0 | 25.0 | * 39 | | 25.0 |
| Max Q Clear Time (g_c+I1), s | 4.0 | 4.4 | | 2.6 | 2.3 | 6.6 | | 7.8 |
| Green Ext Time (p_c), s | 0.0 | 21.4 | | 0.0 | 0.0 | 20.1 | | 0.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 14.5 |
| HCM 2010 LOS | | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 104 | 511 | 51 | 23 | 188 | 7 | 126 | 28 | 54 | 1 | 16 | 31 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 106 | 521 | 20 | 23 | 192 | 2 | 129 | 29 | 12 | 1 | 16 | 3 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 141 | 1898 | 591 | 49 | 1634 | 509 | 245 | 323 | 275 | 4 | 57 | 11 |
| Arrive On Green | 0.08 | 0.37 | 0.37 | 0.03 | 0.32 | 0.32 | 0.14 | 0.17 | 0.17 | 0.00 | 0.04 | 0.04 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1526 | 286 |
| Grp Volume(v), veh/h | 106 | 521 | 20 | 23 | 192 | 2 | 129 | 29 | 12 | 1 | 0 | 19 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1812 |
| Q Serve(g_s), s | 2.8 | 3.4 | 0.4 | 0.6 | 1.3 | 0.0 | 3.2 | 0.6 | 0.3 | 0.0 | 0.0 | 0.5 |
| Cycle Q Clear(g_c), s | 2.8 | 3.4 | 0.4 | 0.6 | 1.3 | 0.0 | 3.2 | 0.6 | 0.3 | 0.0 | 0.0 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 141 | 1898 | 591 | 49 | 1634 | 509 | 245 | 323 | 275 | 4 | 0 | 68 |
| V/C Ratio(X) | 0.75 | 0.27 | 0.03 | 0.47 | 0.12 | 0.00 | 0.53 | 0.09 | 0.04 | 0.26 | 0.00 | 0.28 |
| Avail Cap(c_a), veh/h | 939 | 7323 | 2280 | 939 | 7431 | 2314 | 939 | 1578 | 1341 | 939 | 0 | 1535 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.3 | 10.3 | 9.4 | 22.6 | 11.3 | 10.9 | 18.9 | 16.4 | 16.3 | 23.5 | 0.0 | 22.1 |
| Incr Delay (d2), s/veh | 3.0 | 0.2 | 0.1 | 2.6 | 0.1 | 0.0 | 1.7 | 0.1 | 0.1 | 31.1 | 0.0 | 2.2 |
| 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 | 1.5 | 1.6 | 0.2 | 0.3 | 0.6 | 0.0 | 1.7 | 0.3 | 0.1 | 0.0 | 0.0 | 0.3 |
| LnGrp Delay(d),s/veh | 24.3 | 10.5 | 9.5 | 25.2 | 11.4 | 10.9 | 20.7 | 16.5 | 16.3 | 54.7 | 0.0 | 24.3 |
| LnGrp LOS | C | B | A | C | B | B | C | B | B | D | | C |
| Approach Vol, veh/h | | 647 | | | 217 | | | 170 | | | 20 | |
| Approach Delay, s/veh | | 12.8 | | | 12.8 | | | 19.6 | | | 25.9 | |
| Approach LOS | | B | | | B | | | B | | | 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 | 5.8 | 24.1 | 11.0 | 6.3 | 8.3 | 21.7 | 4.6 | 12.7 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | * 68 | 25.0 | 40.0 | 25.0 | 69.0 | 25.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 2.6 | 5.4 | 5.2 | 2.5 | 4.8 | 3.3 | 2.0 | 2.6 |
| Green Ext Time (p_c), s | 0.0 | 12.3 | 0.3 | 0.3 | 0.1 | 12.3 | 0.0 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.1 |
| HCM 2010 LOS | B |

Notes

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

# Existing Plus Project Conditions

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 50 | 50 | 260 | 280 | 120 | 40 | 1130 | 170 | 90 | 790 | 20 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 22 | 56 | 0 | 289 | 311 | 0 | 44 | 1256 | 0 | 100 | 878 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 42 | 334 | 104 | 379 | 832 | 259 | 81 | 2697 | 840 | 166 | 2822 | 879 |
| Arrive On Green | 0.01 | 0.07 | 0.00 | 0.11 | 0.16 | 0.00 | 0.02 | 0.53 | 0.00 | 0.05 | 0.55 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 22 | 56 | 0 | 289 | 311 | 0 | 44 | 1256 | 0 | 100 | 878 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 0.5 | 0.8 | 0.0 | 6.5 | 4.3 | 0.0 | 1.0 | 12.3 | 0.0 | 2.3 | 7.4 | 0.0 |
| Cycle Q Clear(g_c), s | 0.5 | 0.8 | 0.0 | 6.5 | 4.3 | 0.0 | 1.0 | 12.3 | 0.0 | 2.3 | 7.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 42 | 334 | 104 | 379 | 832 | 259 | 81 | 2697 | 840 | 166 | 2822 | 879 |
| V/C Ratio(X) | 0.53 | 0.17 | 0.00 | 0.76 | 0.37 | 0.00 | 0.54 | 0.47 | 0.00 | 0.60 | 0.31 | 0.00 |
| Avail Cap(c_a), veh/h | 652 | 1779 | 554 | 652 | 1779 | 554 | 652 | 2697 | 840 | 652 | 2822 | 879 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 39.2 | 35.2 | 0.0 | 34.5 | 29.7 | 0.0 | 38.5 | 11.7 | 0.0 | 37.2 | 9.6 | 0.0 |
| Incr Delay (d2), s/veh | 3.7 | 0.4 | 0.0 | 1.2 | 0.5 | 0.0 | 2.1 | 0.6 | 0.0 | 1.3 | 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 | 0.3 | 0.4 | 0.0 | 3.2 | 2.1 | 0.0 | 0.5 | 5.8 | 0.0 | 1.1 | 3.5 | 0.0 |
| LnGrp Delay(d),s/veh | 42.9 | 35.6 | 0.0 | 35.7 | 30.2 | 0.0 | 40.6 | 12.3 | 0.0 | 38.5 | 9.8 | 0.0 |
| LnGrp LOS | D | D | | D | C | | D | B | | D | A | |
| Approach Vol, veh/h | | 78 | | | 600 | | | 1300 | | | 978 | |
| Approach Delay, s/veh | | 37.7 | | | 32.8 | | | 13.2 | | | 12.8 | |
| Approach LOS | | D | | | 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 | 8.3 | 87.8 | 5.5 | 18.4 | 6.4 | 89.8 | 13.3 | 10.5 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 15.1 | 42.3 | 15.1 | 27.9 | 15.1 | 42.3 | 15.1 | 27.9 |
| Max Q Clear Time (g_c+I1), s | 4.3 | 14.3 | 2.5 | 6.3 | 3.0 | 9.4 | 8.5 | 2.8 |
| Green Ext Time (p_c), s | 0.0 | 26.0 | 0.0 | 3.4 | 0.0 | 30.2 | 0.3 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.7 |
| HCM 2010 LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.2 |
| Intersection LOS | C |

| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 80 | 20 | 110 | 0 | 10 | 40 | 20 | 0 | 110 | 140 | 10 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 91 | 23 | 125 | 0 | 11 | 45 | 23 | 0 | 125 | 159 | 11 |
| Number of Lanes | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 3 | 3 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 3 | 3 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 3 | 3 | 1 |
| HCM Control Delay | 11.4 | 12.3 | 12.6 |
| HCM LOS | B | B | B |

| Lane | NBLn1 | NBLn2 | NBLn3 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 100% | 60% | 0% | 14% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 82% | 0% | 40% | 0% | 57% | 0% | 100% | 33% |
| Vol Right, % | 0% | 0% | 18% | 0% | 0% | 100% | 29% | 0% | 0% | 67% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 110 | 93 | 57 | 50 | 50 | 110 | 70 | 30 | 247 | 373 |
| LT Vol | 0 | 93 | 47 | 0 | 20 | 0 | 40 | 0 | 247 | 123 |
| Through Vol | 0 | 0 | 10 | 0 | 0 | 110 | 20 | 0 | 0 | 250 |
| RT Vol | 110 | 0 | 0 | 50 | 30 | 0 | 10 | 30 | 0 | 0 |
| Lane Flow Rate | 125 | 106 | 64 | 56 | 57 | 125 | 80 | 34 | 280 | 424 |
| Geometry Grp | 8 | 8 | 8 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.276 | 0.219 | 0.131 | 0.121 | 0.12 | 0.227 | 0.175 | 0.067 | 0.51 | 0.715 |
| Departure Headway (Hd) | 7.938 | 7.43 | 7.304 | 7.848 | 7.648 | 6.638 | 7.927 | 7.153 | 6.647 | 6.172 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 455 | 486 | 493 | 459 | 471 | 544 | 455 | 504 | 547 | 590 |
| Service Time | 5.645 | 5.136 | 5.011 | 5.548 | 5.348 | 4.338 | 5.639 | 4.853 | 4.347 | 3.872 |
| HCM Lane V/C Ratio | 0.275 | 0.218 | 0.13 | 0.122 | 0.121 | 0.23 | 0.176 | 0.067 | 0.512 | 0.719 |
| HCM Control Delay | 13.6 | 12.2 | 11.1 | 11.6 | 11.4 | 11.3 | 12.3 | 10.4 | 16.1 | 22.8 |
| HCM Lane LOS | B | B | B | B | B | B | B | B | C | C |
| HCM 95th-tile Q | 1.1 | 0.8 | 0.4 | 0.4 | 0.4 | 0.9 | 0.6 | 0.2 | 2.9 | 5.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | |
| Intersection LOS | |

| Movement | SBU | SBL | SBT | SBR |
|---|---|---|---|---|
| Vol, veh/h | 0 | 30 | 370 | 250 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 34 | 420 | 284 |
| Number of Lanes | 0 | 1 | 2 | 0 |

| Approach | SB |
|---|---|
| Opposing Approach | NB |
| Opposing Lanes | 3 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 1 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 19.7 |
| HCM LOS | C |

| Lane |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 70 | 210 | 70 | 90 | 480 | 30 | 20 | 10 | 10 | 60 | 50 | 290 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 75 | 226 | 20 | 97 | 516 | 0 | 16 | 19 | 0 | 65 | 54 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 143 | 2072 | 644 | 182 | 2130 | 663 | 47 | 49 | 42 | 240 | 130 | 110 |
| Arrive On Green | 0.04 | 0.41 | 0.41 | 0.05 | 0.42 | 0.00 | 0.03 | 0.03 | 0.00 | 0.07 | 0.07 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1581 | 3442 | 5085 | 1583 | 1774 | 1863 | 1583 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 75 | 226 | 20 | 97 | 516 | 0 | 16 | 19 | 0 | 65 | 54 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1581 | 1721 | 1695 | 1583 | 1774 | 1863 | 1583 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 0.9 | 1.2 | 0.3 | 1.2 | 2.8 | 0.0 | 0.4 | 0.4 | 0.0 | 0.8 | 1.2 | 0.0 |
| Cycle Q Clear(g_c), s | 0.9 | 1.2 | 0.3 | 1.2 | 2.8 | 0.0 | 0.4 | 0.4 | 0.0 | 0.8 | 1.2 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 143 | 2072 | 644 | 182 | 2130 | 663 | 47 | 49 | 42 | 240 | 130 | 110 |
| V/C Ratio(X) | 0.53 | 0.11 | 0.03 | 0.53 | 0.24 | 0.00 | 0.34 | 0.38 | 0.00 | 0.27 | 0.42 | 0.00 |
| Avail Cap(c_a), veh/h | 2008 | 8069 | 2509 | 2008 | 8069 | 2512 | 1035 | 1087 | 924 | 3212 | 1739 | 1478 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.1 | 7.9 | 7.6 | 19.8 | 8.1 | 0.0 | 20.5 | 20.5 | 0.0 | 18.9 | 19.1 | 0.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.1 | 0.1 | 0.9 | 0.2 | 0.0 | 1.6 | 1.8 | 0.0 | 0.2 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.6 | 0.1 | 0.6 | 1.3 | 0.0 | 0.2 | 0.2 | 0.0 | 0.4 | 0.6 | 0.0 |
| LnGrp Delay(d),s/veh | 21.2 | 7.9 | 7.7 | 20.7 | 8.2 | 0.0 | 22.1 | 22.3 | 0.0 | 19.1 | 19.9 | 0.0 |
| LnGrp LOS | C | A | A | C | A | | C | C | | B | B | |
| Approach Vol, veh/h | | 321 | | | 613 | | | 35 | | | 119 | |
| Approach Delay, s/veh | | 11.0 | | | 10.2 | | | 22.2 | | | 19.5 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 6.8 | 23.0 | | 5.6 | 6.3 | 23.5 | | 7.5 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 68.0 | | 25.0 | 25.0 | 68.0 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 3.2 | | 2.4 | 2.9 | 4.8 | | 3.2 |
| Green Ext Time (p_c), s | 0.1 | 13.0 | | 0.0 | 0.1 | 13.0 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.8 |
| HCM 2010 LOS | B |

| Notes |
|---|
| User approved pedestrian interval to be less than phase max green. |
| User approved volume balancing among the lanes for turning movement. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 40 | 50 | 250 | 500 | 210 | 90 | 610 | 1290 | 240 | 60 | 1000 | 40 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 42 | 53 | 16 | 526 | 221 | 0 | 642 | 1358 | 0 | 63 | 1053 | 0 |
| Adj No. of Lanes | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 78 | 214 | 96 | 622 | 1102 | 343 | 752 | 2487 | 774 | 113 | 1543 | 480 |
| Arrive On Green | 0.02 | 0.06 | 0.06 | 0.18 | 0.22 | 0.00 | 0.07 | 0.16 | 0.00 | 0.03 | 0.30 | 0.00 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 42 | 53 | 16 | 526 | 221 | 0 | 642 | 1358 | 0 | 63 | 1053 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 1.0 | 1.2 | 0.8 | 12.0 | 2.9 | 0.0 | 15.1 | 20.2 | 0.0 | 1.5 | 14.9 | 0.0 |
| Cycle Q Clear(g_c), s | 1.0 | 1.2 | 0.8 | 12.0 | 2.9 | 0.0 | 15.1 | 20.2 | 0.0 | 1.5 | 14.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 78 | 214 | 96 | 622 | 1102 | 343 | 752 | 2487 | 774 | 113 | 1543 | 480 |
| V/C Ratio(X) | 0.54 | 0.25 | 0.17 | 0.85 | 0.20 | 0.00 | 0.85 | 0.55 | 0.00 | 0.56 | 0.68 | 0.00 |
| Avail Cap(c_a), veh/h | 884 | 944 | 422 | 893 | 1356 | 422 | 985 | 2487 | 774 | 985 | 2099 | 654 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.60 | 0.60 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 39.7 | 36.8 | 36.6 | 32.6 | 26.3 | 0.0 | 36.8 | 26.1 | 0.0 | 39.1 | 25.1 | 0.0 |
| Incr Delay (d2), s/veh | 2.1 | 1.5 | 2.0 | 3.7 | 0.3 | 0.0 | 2.9 | 0.5 | 0.0 | 1.6 | 1.2 | 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 | 0.5 | 0.6 | 0.4 | 6.1 | 1.4 | 0.0 | 7.5 | 9.6 | 0.0 | 0.7 | 7.2 | 0.0 |
| LnGrp Delay(d),s/veh | 41.8 | 38.3 | 38.6 | 36.3 | 26.6 | 0.0 | 39.7 | 26.6 | 0.0 | 40.7 | 26.3 | 0.0 |
| LnGrp LOS | D | D | D | D | C | | D | C | | D | C | |
| Approach Vol, veh/h | | 111 | | | 747 | | | 2000 | | | 1116 | |
| Approach Delay, s/veh | | 39.7 | | | 33.4 | | | 30.8 | | | 27.2 | |
| Approach LOS | | D | | | C | | | C | | | 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 | 7.2 | 83.3 | 6.4 | 23.1 | 60.3 | 30.2 | 19.2 | 10.3 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 23.5 | 33.9 | 21.1 | 21.9 | 23.5 | 33.9 | 21.1 | 21.9 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 22.2 | 3.0 | 4.9 | 17.1 | 16.9 | 14.0 | 3.2 |
| Green Ext Time (p_c), s | 0.1 | 11.3 | 0.0 | 2.9 | 0.8 | 8.0 | 0.7 | 3.1 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 30.5 |
| HCM 2010 LOS | | | C |

Notes

User approved ignoring U-Turning movement.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.8 |
| Intersection LOS | A |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 100 | 110 | 0 | 210 | 20 | 0 | 20 | 330 |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 127 | 139 | 0 | 266 | 25 | 0 | 25 | 418 |
| Number of Lanes | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 2 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 3 | 3 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 3 | 0 | 3 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 3 | 3 |
| HCM Control Delay | 10.1 | 11.1 | 8.8 |
| HCM LOS | B | B | A |

| Lane | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 100% | 100% | 100% | 78% | 0% | 0% | 0% |
| Vol Right, % | 0% | 0% | 0% | 0% | 0% | 22% | 0% | 100% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 100 | 55 | 55 | 0 | 140 | 90 | 20 | 165 | 165 |
| LT Vol | 0 | 55 | 55 | 0 | 140 | 70 | 0 | 0 | 0 |
| Through Vol | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 165 | 165 |
| RT Vol | 100 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| Lane Flow Rate | 127 | 70 | 70 | 0 | 177 | 114 | 25 | 209 | 209 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 |
| Degree of Util (X) | 0.239 | 0.122 | 0.088 | 0 | 0.306 | 0.192 | 0.045 | 0.303 | 0.202 |
| Departure Headway (Hd) | 6.799 | 6.294 | 4.541 | 6.217 | 6.217 | 6.059 | 6.553 | 5.348 | 3.607 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 530 | 572 | 791 | 0 | 579 | 595 | 550 | 677 | 1000 |
| Service Time | 4.517 | 4.012 | 2.259 | 3.932 | 3.932 | 3.775 | 4.253 | 3.048 | 1.307 |
| HCM Lane V/C Ratio | 0.24 | 0.122 | 0.088 | 0 | 0.306 | 0.192 | 0.045 | 0.309 | 0.209 |
| HCM Control Delay | 11.6 | 9.9 | 7.7 | 8.9 | 11.7 | 10.2 | 9.6 | 10.4 | 7.2 |
| HCM Lane LOS | B | A | A | N | B | B | A | B | A |
| HCM 95th-tile Q | 0.9 | 0.4 | 0.3 | 0 | 1.3 | 0.7 | 0.1 | 1.3 | 0.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 460 | 0 | 1680 | 150 | 210 | 720 | 890 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.94 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4530 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4530 | 1362 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 495 | 0 | 1806 | 161 | 226 | 774 | 957 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 52 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 447 | 0 | 1806 | 109 | 226 | 1253 | 478 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 37.2 | | 62.2 | 62.2 | 37.2 | 120.0 | 120.0 |
| Effective Green, g (s) | | | | | | 37.2 | | 62.2 | 62.2 | 37.2 | 120.0 | 120.0 |
| Actuated g/C Ratio | | | | | | 0.31 | | 0.52 | 0.52 | 0.31 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 499 | | 2635 | 820 | 548 | 4530 | 1362 |
| v/s Ratio Prot | | | | | | c0.28 | | c0.36 | | 0.13 | 0.28 | |
| v/s Ratio Perm | | | | | | | | | 0.07 | | | 0.35 |
| v/c Ratio | | | | | | 0.90 | | 0.69 | 0.13 | 0.41 | 0.28 | 0.35 |
| Uniform Delay, d1 | | | | | | 39.6 | | 21.6 | 15.0 | 32.8 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 1.00 | 1.00 | 0.64 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 18.1 | | 1.2 | 0.2 | 0.1 | 0.1 | 0.5 |
| Delay (s) | | | | | | 57.6 | | 22.8 | 15.2 | 21.2 | 0.1 | 0.5 |
| Level of Service | | | | | | E | | C | B | C | A | A |
| Approach Delay (s) | | 0.0 | | | 57.6 | | | 22.1 | | | 2.7 | |
| Approach LOS | | A | | | E | | | C | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 17.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 69.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 140 | 960 | 870 | 170 | 0 | 720 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 151 | 906 | 935 | 0 | 0 | 774 |
| Adj No. of Lanes | 2 | 2 | 2 | 1 | 0 | 3 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 1318 | 1067 | 1569 | 667 | 0 | 2142 |
| Arrive On Green | 0.38 | 0.38 | 0.42 | 0.00 | 0.00 | 0.42 |
| Sat Flow, veh/h | 3442 | 2787 | 3725 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 151 | 906 | 935 | 0 | 0 | 774 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1863 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 1.4 | 14.6 | 9.5 | 0.0 | 0.0 | 5.1 |
| Cycle Q Clear(g_c), s | 1.4 | 14.6 | 9.5 | 0.0 | 0.0 | 5.1 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 1318 | 1067 | 1569 | 667 | 0 | 2142 |
| V/C Ratio(X) | 0.11 | 0.85 | 0.60 | 0.00 | 0.00 | 0.36 |
| Avail Cap(c_a), veh/h | 2105 | 1705 | 3798 | 1614 | 0 | 5184 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 9.8 | 13.8 | 11.0 | 0.0 | 0.0 | 9.7 |
| Incr Delay (d2), s/veh | 0.0 | 1.3 | 0.1 | 0.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 5.7 | 4.8 | 0.0 | 0.0 | 2.4 |
| LnGrp Delay(d),s/veh | 9.8 | 15.1 | 11.1 | 0.0 | 0.0 | 9.7 |
| LnGrp LOS | A | B | B | | | A |
| Approach Vol, veh/h | 1057 | | 935 | | | 774 |
| Approach Delay, s/veh | 14.4 | | 11.1 | | | 9.7 |
| Approach LOS | B | | B | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 26.0 | | | | 26.0 | | 23.1 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 50.0 | | | | 50.0 | | 30.0 |
| Max Q Clear Time (g_c+I1), s | | 11.5 | | | | 7.1 | | 16.6 |
| Green Ext Time (p_c), s | | 9.2 | | | | 9.3 | | 2.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 12.0 |
| HCM 2010 LOS | | B |

## Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 670 | 0 | 120 | 0 | 0 | 0 | 0 | 370 | 100 | 0 | 290 | 570 |
| 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 | 744 | 0 | 42 | | | | 0 | 411 | 0 | 0 | 322 | 0 |
| Adj No. of Lanes | 2 | 0 | 1 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1106 | 0 | 509 | | | | 0 | 1058 | 473 | 0 | 1113 | 473 |
| Arrive On Green | 0.32 | 0.00 | 0.32 | | | | 0.00 | 0.30 | 0.00 | 0.00 | 0.30 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 1583 | | | | 0 | 3632 | 1583 | 0 | 3725 | 1583 |
| Grp Volume(v), veh/h | 744 | 0 | 42 | | | | 0 | 411 | 0 | 0 | 322 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1583 | | | | 0 | 1770 | 1583 | 0 | 1863 | 1583 |
| Q Serve(g_s), s | 4.7 | 0.0 | 0.5 | | | | 0.0 | 2.3 | 0.0 | 0.0 | 1.7 | 0.0 |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 0.5 | | | | 0.0 | 2.3 | 0.0 | 0.0 | 1.7 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1106 | 0 | 509 | | | | 0 | 1058 | 473 | 0 | 1113 | 473 |
| V/C Ratio(X) | 0.67 | 0.00 | 0.08 | | | | 0.00 | 0.39 | 0.00 | 0.00 | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 3404 | 0 | 1566 | | | | 0 | 6300 | 2818 | 0 | 6632 | 2818 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.4 | 0.0 | 6.0 | | | | 0.0 | 7.0 | 0.0 | 0.0 | 6.8 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 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 | 2.2 | 0.0 | 0.2 | | | | 0.0 | 1.2 | 0.0 | 0.0 | 0.9 | 0.0 |
| LnGrp Delay(d),s/veh | 7.7 | 0.0 | 6.0 | | | | 0.0 | 7.1 | 0.0 | 0.0 | 6.9 | 0.0 |
| LnGrp LOS | A | | A | | | | | A | | | A | |
| Approach Vol, veh/h | | 786 | | | | | | 411 | | | 322 | |
| Approach Delay, s/veh | | 7.6 | | | | | | 7.1 | | | 6.9 | |
| Approach LOS | | A | | | | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 12.9 | | 12.4 | | 12.9 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 45.0 | | * 25 | | 45.0 | | |
| Max Q Clear Time (g_c+I1), s | | 4.3 | | 6.7 | | 3.7 | | |
| Green Ext Time (p_c), s | | 3.0 | | 1.4 | | 3.0 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 7.3 |
| 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 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 160 | 70 | 730 | 100 | 120 | 50 | 520 | 510 | 110 | 50 | 840 | 970 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 172 | 173 | 312 | 87 | 158 | 24 | 559 | 548 | 105 | 54 | 1007 | 486 |
| Adj No. of Lanes | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 2 | 0 | 1 | 2 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 202 | 203 | 353 | 155 | 277 | 41 | 773 | 1375 | 263 | 124 | 1110 | 472 |
| Arrive On Green | 0.22 | 0.22 | 0.22 | 0.09 | 0.09 | 0.09 | 0.22 | 0.46 | 0.46 | 0.07 | 0.30 | 0.30 |
| Sat Flow, veh/h | 906 | 911 | 1583 | 1774 | 3169 | 473 | 3442 | 2965 | 566 | 1774 | 3725 | 1583 |
| Grp Volume(v), veh/h | 345 | 0 | 312 | 87 | 92 | 90 | 559 | 326 | 327 | 54 | 1007 | 486 |
| Grp Sat Flow(s),veh/h/ln | 1817 | 0 | 1583 | 1774 | 1863 | 1779 | 1721 | 1770 | 1761 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 20.9 | 0.0 | 21.8 | 5.4 | 5.4 | 5.6 | 17.2 | 13.9 | 14.0 | 3.3 | 29.8 | 34.1 |
| Cycle Q Clear(g_c), s | 20.9 | 0.0 | 21.8 | 5.4 | 5.4 | 5.6 | 17.2 | 13.9 | 14.0 | 3.3 | 29.8 | 34.1 |
| Prop In Lane | 0.50 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 0.32 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 405 | 0 | 353 | 155 | 163 | 155 | 773 | 821 | 817 | 124 | 1110 | 472 |
| V/C Ratio(X) | 0.85 | 0.00 | 0.89 | 0.56 | 0.56 | 0.58 | 0.72 | 0.40 | 0.40 | 0.44 | 0.91 | 1.03 |
| Avail Cap(c_a), veh/h | 603 | 0 | 526 | 248 | 260 | 249 | 773 | 821 | 817 | 155 | 1110 | 472 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.7 | 0.0 | 43.1 | 50.1 | 50.2 | 50.2 | 41.1 | 20.2 | 20.2 | 51.1 | 38.7 | 40.2 |
| Incr Delay (d2), s/veh | 5.1 | 0.0 | 8.5 | 1.2 | 1.1 | 1.3 | 2.9 | 1.4 | 1.5 | 0.9 | 12.3 | 49.5 |
| 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 | 11.0 | 0.0 | 10.4 | 2.7 | 2.8 | 2.8 | 8.5 | 7.1 | 7.1 | 1.7 | 17.1 | 21.3 |
| LnGrp Delay(d),s/veh | 47.8 | 0.0 | 51.6 | 51.3 | 51.3 | 51.5 | 44.0 | 21.6 | 21.7 | 52.0 | 51.0 | 89.7 |
| LnGrp LOS | D | | D | D | D | D | D | C | C | D | D | F |
| Approach Vol, veh/h | | 657 | | | 269 | | | 1212 | | | 1547 | |
| Approach Delay, s/veh | | 49.6 | | | 51.4 | | | 32.0 | | | 63.2 | |
| Approach LOS | | D | | | D | | | 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 | 12.0 | 78.9 | | 30.1 | 51.5 | 39.4 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 5.3 | * 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 10.0 | 53.1 | | 38.0 | 24.7 | * 34 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 16.0 | | 23.8 | 19.2 | 36.1 | | 7.6 |
| Green Ext Time (p_c), s | 0.0 | 5.0 | | 1.7 | 2.4 | 0.0 | | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 49.6 |
| HCM 2010 LOS | D |

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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 1030 | 0 | 0 | 340 | 0 | 800 | 260 | 270 | 1400 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1544 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1544 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 1108 | 0 | 0 | 366 | 0 | 860 | 280 | 290 | 1505 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 79 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 1082 | 0 | 0 | 366 | 0 | 860 | 201 | 290 | 1505 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 5 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 52.4 | | | 135.0 | | 96.9 | 96.9 | 28.4 | 72.3 | |
| Effective Green, g (s) | | | 52.4 | | | 135.0 | | 96.9 | 96.9 | 28.4 | 72.3 | |
| Actuated g/C Ratio | | | 0.39 | | | 1.00 | | 0.72 | 0.72 | 0.21 | 0.54 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 1081 | | | 1591 | | 3649 | 1108 | 372 | 3431 | |
| v/s Ratio Prot | | | c0.39 | | | | | 0.17 | | c0.16 | c0.23 | |
| v/s Ratio Perm | | | | | | 0.23 | | | 0.13 | | | |
| v/c Ratio | | | 1.00 | | | 0.23 | | 0.24 | 0.18 | 0.78 | 0.44 | |
| Uniform Delay, d1 | | | 41.3 | | | 0.0 | | 6.5 | 6.2 | 50.3 | 19.0 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.08 | 0.55 | |
| Incremental Delay, d2 | | | 27.7 | | | 0.3 | | 0.2 | 0.4 | 0.9 | 0.0 | |
| Delay (s) | | | 69.0 | | | 0.3 | | 6.6 | 6.5 | 55.3 | 10.6 | |
| Level of Service | | | E | | | A | | A | A | E | B | |
| Approach Delay (s) | | 69.0 | | | 0.3 | | | 6.6 | | | 17.8 | |
| Approach LOS | | E | | | A | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 26.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 135.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 64.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 38.4 |
| Intersection LOS | E |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 210 | 190 | 0 | 410 | 70 | 0 | 80 | 290 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 256 | 232 | 0 | 500 | 85 | 0 | 98 | 354 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 2 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 1 | 0 | 1 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 1 | 2 |
| HCM Control Delay | 17.3 | 63.1 | 29 |
| HCM LOS | C | F | D |

| Lane | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 22% |
| Vol Thru, % | 0% | 100% | 85% | 0% |
| Vol Right, % | 0% | 0% | 15% | 78% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 210 | 190 | 480 | 370 |
| LT Vol | 0 | 190 | 410 | 0 |
| Through Vol | 0 | 0 | 70 | 290 |
| RT Vol | 210 | 0 | 0 | 80 |
| Lane Flow Rate | 256 | 232 | 585 | 451 |
| Geometry Grp | 7 | 7 | 5 | 2 |
| Degree of Util (X) | 0.54 | 0.456 | 1 | 0.791 |
| Departure Headway (Hd) | 7.597 | 7.084 | 6.398 | 6.308 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 476 | 510 | 574 | 578 |
| Service Time | 5.299 | 4.798 | 4.398 | 4.301 |
| HCM Lane V/C Ratio | 0.538 | 0.455 | 1.019 | 0.78 |
| HCM Control Delay | 18.9 | 15.6 | 63.1 | 29 |
| HCM Lane LOS | C | C | F | D |
| HCM 95th-tile Q | 3.2 | 2.4 | 14.5 | 7.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 25 | 240 | 5 | 5 | 425 | 330 | 5 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Yield | Yield | Yield |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 27 | 255 | 5 | 5 | 452 | 351 | 5 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 805 | 0 | 0 | 261 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 819 | - | - | 1303 | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Platoon blocked, % | | - | - | | - | - |
| Mov Cap-1 Maneuver | 818 | - | - | 1301 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 0.9 | 0.1 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 818 | - | - | 1301 | - | - | 283 |
| HCM Lane V/C Ratio | 0.033 | - | - | 0.004 | - | - | 0.526 |
| HCM Control Delay (s) | 9.5 | 0 | - | 7.8 | 0 | - | 31 |
| HCM Lane LOS | A | A | - | A | A | - | D |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - | - | 2.8 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 90 | 0 | 50 |
| Conflicting Peds, #/hr | 0 | 0 | 2 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 96 | 0 | 53 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 951 | 954 | 632 |
| Stage 1 | 640 | 640 | - |
| Stage 2 | 311 | 314 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 240 | 259 | 480 |
| Stage 1 | 464 | 470 | - |
| Stage 2 | 699 | 656 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 231 | 247 | 478 |
| Mov Cap-2 Maneuver | 231 | 247 | - |
| Stage 1 | 445 | 466 | - |
| Stage 2 | 671 | 630 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 31 |
| HCM LOS | D |

| Minor Lane/Major Mvmt |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 260 | 130 | 80 | 230 | 210 | 200 | 50 | 440 | 120 | 120 | 1090 | 410 |
| 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 | | 0.99 | 1.00 | | 0.99 | 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 | 1845 | 1849 | 1900 | 1863 | 1863 | 1863 | 1810 | 1810 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 283 | 141 | 8 | 250 | 228 | 15 | 54 | 478 | 66 | 130 | 1185 | 208 |
| Adj No. of Lanes | 2 | 2 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 379 | 465 | 26 | 340 | 443 | 196 | 69 | 2841 | 713 | 206 | 2422 | 744 |
| Arrive On Green | 0.11 | 0.14 | 0.14 | 0.10 | 0.13 | 0.13 | 0.04 | 0.46 | 0.46 | 0.06 | 0.48 | 0.48 |
| Sat Flow, veh/h | 3408 | 3379 | 190 | 3442 | 3539 | 1564 | 1723 | 6225 | 1563 | 3442 | 5085 | 1563 |
| Grp Volume(v), veh/h | 283 | 73 | 76 | 250 | 228 | 15 | 54 | 478 | 66 | 130 | 1185 | 208 |
| Grp Sat Flow(s),veh/h/ln | 1704 | 1756 | 1813 | 1721 | 1770 | 1564 | 1723 | 1556 | 1563 | 1721 | 1695 | 1563 |
| Q Serve(g_s), s | 7.3 | 3.4 | 3.4 | 6.4 | 5.5 | 0.8 | 2.8 | 4.1 | 2.2 | 3.4 | 14.5 | 7.3 |
| Cycle Q Clear(g_c), s | 7.3 | 3.4 | 3.4 | 6.4 | 5.5 | 0.8 | 2.8 | 4.1 | 2.2 | 3.4 | 14.5 | 7.3 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 379 | 241 | 249 | 340 | 443 | 196 | 69 | 2841 | 713 | 206 | 2422 | 744 |
| V/C Ratio(X) | 0.75 | 0.30 | 0.31 | 0.74 | 0.51 | 0.08 | 0.78 | 0.17 | 0.09 | 0.63 | 0.49 | 0.28 |
| Avail Cap(c_a), veh/h | 900 | 719 | 742 | 719 | 1643 | 726 | 303 | 2841 | 713 | 757 | 2422 | 744 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 35.3 | 35.3 | 39.8 | 37.2 | 35.1 | 43.3 | 14.6 | 14.0 | 41.8 | 16.3 | 14.4 |
| Incr Delay (d2), s/veh | 3.0 | 0.7 | 0.7 | 3.1 | 0.9 | 0.2 | 17.3 | 0.1 | 0.3 | 3.2 | 0.7 | 0.9 |
| 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 | 3.6 | 1.7 | 1.8 | 3.2 | 2.7 | 0.3 | 1.7 | 1.8 | 1.0 | 1.7 | 6.9 | 3.3 |
| LnGrp Delay(d),s/veh | 42.1 | 36.0 | 36.0 | 42.9 | 38.1 | 35.3 | 60.6 | 14.7 | 14.3 | 44.9 | 17.0 | 15.3 |
| LnGrp LOS | D | D | D | D | D | D | E | B | B | D | B | B |
| Approach Vol, veh/h | | 432 | | | 493 | | | 598 | | | 1523 | |
| Approach Delay, s/veh | | 40.0 | | | 40.5 | | | 18.8 | | | 19.1 | |
| Approach LOS | | D | | | D | | | 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 | 10.4 | 47.2 | 15.0 | 18.3 | 8.6 | 49.0 | 16.1 | 17.2 |
| Change Period (Y+Rc), s | 5.0 | 5.7 | 6.0 | * 5.8 | 5.0 | 5.7 | 6.0 | 5.8 |
| Max Green Setting (Gmax), s | 20.0 | 39.3 | 19.0 | * 37 | 16.0 | 43.3 | 24.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 5.4 | 6.1 | 8.4 | 5.4 | 4.8 | 16.5 | 9.3 | 7.5 |
| Green Ext Time (p_c), s | 0.3 | 16.2 | 0.6 | 2.2 | 0.1 | 14.5 | 0.8 | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.5 |
| HCM 2010 LOS | C |

**Notes**

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 220 | 100 | 10 | 670 | 20 | 80 | 10 | 10 | 10 | 10 | 50 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 33 | 242 | 52 | 11 | 736 | 10 | 96 | 0 | 0 | 11 | 11 | 0 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 38 | 2643 | 823 | 12 | 2567 | 789 | 181 | 0 | 81 | 22 | 23 | 19 |
| Arrive On Green | 0.02 | 0.52 | 0.52 | 0.01 | 0.50 | 0.50 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 33 | 242 | 52 | 11 | 736 | 10 | 96 | 0 | 0 | 11 | 11 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 0.9 | 1.2 | 0.8 | 0.3 | 4.1 | 0.2 | 1.3 | 0.0 | 0.0 | 0.3 | 0.3 | 0.0 |
| Cycle Q Clear(g_c), s | 0.9 | 1.2 | 0.8 | 0.3 | 4.1 | 0.2 | 1.3 | 0.0 | 0.0 | 0.3 | 0.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 38 | 2643 | 823 | 12 | 2567 | 789 | 181 | 0 | 81 | 22 | 23 | 19 |
| V/C Ratio(X) | 0.86 | 0.09 | 0.06 | 0.95 | 0.29 | 0.01 | 0.53 | 0.00 | 0.00 | 0.51 | 0.48 | 0.00 |
| Avail Cap(c_a), veh/h | 910 | 4068 | 1267 | 910 | 4172 | 1283 | 1820 | 0 | 812 | 910 | 955 | 812 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 23.8 | 5.9 | 5.8 | 24.2 | 7.0 | 6.0 | 22.6 | 0.0 | 0.0 | 23.9 | 23.9 | 0.0 |
| Incr Delay (d2), s/veh | 18.5 | 0.1 | 0.1 | 62.1 | 0.3 | 0.0 | 0.9 | 0.0 | 0.0 | 6.6 | 5.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.6 | 0.4 | 0.3 | 2.0 | 0.1 | 0.6 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 |
| LnGrp Delay(d),s/veh | 42.2 | 6.0 | 5.9 | 86.3 | 7.3 | 6.0 | 23.4 | 0.0 | 0.0 | 30.5 | 29.6 | 0.0 |
| LnGrp LOS | D | A | A | F | A | A | C | | | C | C | |
| Approach Vol, veh/h | | 327 | | | 757 | | | 96 | | | 22 | |
| Approach Delay, s/veh | | 9.6 | | | 8.4 | | | 23.4 | | | 30.1 | |
| Approach LOS | | A | | | A | | | 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 | 5.5 | 31.1 | | 5.1 | 4.8 | 31.8 | | 7.0 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 40.0 | | 25.0 | 25.0 | * 39 | | 25.0 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 6.1 | | 2.3 | 2.3 | 3.2 | | 3.3 |
| Green Ext Time (p_c), s | 0.0 | 18.5 | | 0.0 | 0.0 | 19.1 | | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.3 |
| 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. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 60 | 150 | 30 | 40 | 530 | 20 | 80 | 10 | 10 | 40 | 20 | 90 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 68 | 170 | 9 | 45 | 602 | 5 | 91 | 11 | 1 | 45 | 23 | 8 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 108 | 1965 | 612 | 82 | 1891 | 589 | 203 | 179 | 152 | 132 | 74 | 26 |
| Arrive On Green | 0.06 | 0.39 | 0.39 | 0.05 | 0.37 | 0.37 | 0.11 | 0.10 | 0.10 | 0.07 | 0.06 | 0.06 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1322 | 460 |
| Grp Volume(v), veh/h | 68 | 170 | 9 | 45 | 602 | 5 | 91 | 11 | 1 | 45 | 0 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1782 |
| Q Serve(g_s), s | 1.9 | 1.1 | 0.2 | 1.3 | 4.2 | 0.1 | 2.4 | 0.3 | 0.0 | 1.2 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | 1.9 | 1.1 | 0.2 | 1.3 | 4.2 | 0.1 | 2.4 | 0.3 | 0.0 | 1.2 | 0.0 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.26 |
| Lane Grp Cap(c), veh/h | 108 | 1965 | 612 | 82 | 1891 | 589 | 203 | 179 | 152 | 132 | 0 | 100 |
| V/C Ratio(X) | 0.63 | 0.09 | 0.01 | 0.55 | 0.32 | 0.01 | 0.45 | 0.06 | 0.01 | 0.34 | 0.00 | 0.31 |
| Avail Cap(c_a), veh/h | 880 | 6863 | 2137 | 880 | 6964 | 2168 | 880 | 1479 | 1257 | 880 | 0 | 1414 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.1 | 9.8 | 9.5 | 23.5 | 11.3 | 10.0 | 20.8 | 20.7 | 20.6 | 22.2 | 0.0 | 22.9 |
| Incr Delay (d2), s/veh | 2.2 | 0.1 | 0.0 | 2.1 | 0.2 | 0.0 | 1.5 | 0.1 | 0.0 | 1.5 | 0.0 | 1.8 |
| 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 | 1.0 | 0.5 | 0.1 | 0.7 | 2.0 | 0.0 | 1.3 | 0.1 | 0.0 | 0.6 | 0.0 | 0.5 |
| LnGrp Delay(d),s/veh | 25.3 | 9.9 | 9.6 | 25.6 | 11.5 | 10.0 | 22.4 | 20.9 | 20.6 | 23.7 | 0.0 | 24.6 |
| LnGrp LOS | C | A | A | C | B | A | C | C | C | C | | C |
| Approach Vol, veh/h | | 247 | | | 652 | | | 103 | | | 76 | |
| Approach Delay, s/veh | | 14.1 | | | 12.4 | | | 22.2 | | | 24.1 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 6.8 | 26.0 | 10.3 | 7.3 | 7.6 | 25.2 | 8.2 | 9.3 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | * 68 | 25.0 | 40.0 | 25.0 | 69.0 | 25.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 3.1 | 4.4 | 2.8 | 3.9 | 6.2 | 3.2 | 2.3 |
| Green Ext Time (p_c), s | 0.0 | 12.5 | 0.2 | 0.2 | 0.1 | 12.5 | 0.1 | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.6 |
| HCM 2010 LOS | B |

Notes

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

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.8 |
| Intersection LOS | B |

| Movement | WBU | WBL | WBR | NBU | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 10 | 210 | 0 | 260 | 20 | 0 | 70 | 340 |
| Peak Hour Factor | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 228 | 0 | 283 | 22 | 0 | 76 | 370 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | WB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 2 | 1 |
| Conflicting Approach Left | NB | | WB |
| Conflicting Lanes Left | 1 | 0 | 2 |
| Conflicting Approach Right | SB | WB | |
| Conflicting Lanes Right | 2 | 2 | 0 |
| HCM Control Delay | 11.8 | 13.7 | 14.9 |
| HCM LOS | B | B | B |

| Lane | NBLn1 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 100% | 0% |
| Vol Thru, % | 93% | 0% | 0% | 0% | 100% |
| Vol Right, % | 7% | 0% | 100% | 0% | 0% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 280 | 10 | 210 | 70 | 340 |
| LT Vol | 260 | 0 | 0 | 0 | 340 |
| Through Vol | 20 | 0 | 210 | 0 | 0 |
| RT Vol | 0 | 10 | 0 | 70 | 0 |
| Lane Flow Rate | 304 | 11 | 228 | 76 | 370 |
| Geometry Grp | 4 | 7 | 7 | 7 | 7 |
| Degree of Util (X) | 0.477 | 0.021 | 0.367 | 0.13 | 0.58 |
| Departure Headway (Hd) | 5.644 | 7.003 | 5.785 | 6.155 | 5.649 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 639 | 511 | 621 | 584 | 639 |
| Service Time | 3.674 | 4.742 | 3.523 | 3.882 | 3.376 |
| HCM Lane V/C Ratio | 0.476 | 0.022 | 0.367 | 0.13 | 0.579 |
| HCM Control Delay | 13.7 | 9.9 | 11.9 | 9.8 | 15.9 |
| HCM Lane LOS | B | A | B | A | C |
| HCM 95th-tile Q | 2.6 | 0.1 | 1.7 | 0.4 | 3.7 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 3.9 |
| Intersection LOS | A |

| Approach | EB | NB | SB |
|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 81 | 43 | 60 |
| Demand Flow Rate, veh/h | 82 | 44 | 61 |
| Vehicles Circulating, veh/h | 39 | 66 | 16 |
| Vehicles Exiting, veh/h | 38 | 55 | 94 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 5 | 5 | 5 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 4.0 | 3.8 | 3.7 |
| Approach LOS | A | A | A |

| Lane | Left | Left | Left |
|---|---|---|---|
| Designated Moves | LR | LT | TR |
| Assumed Moves | LR | LT | TR |
| RT Channelized | | | |
| Lane Util | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 82 | 44 | 61 |
| Cap Entry Lane, veh/h | 1087 | 1058 | 1112 |
| Entry HV Adj Factor | 0.988 | 0.988 | 0.987 |
| Flow Entry, veh/h | 81 | 43 | 60 |
| Cap Entry, veh/h | 1073 | 1044 | 1097 |
| V/C Ratio | 0.076 | 0.042 | 0.055 |
| Control Delay, s/veh | 4.0 | 3.8 | 3.7 |
| LOS | A | A | A |
| 95th %tile Queue, veh | 0 | 0 | 0 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.5 |
| Intersection LOS | B |

| Movement | WBU | WBL | WBR | NBU | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 10 | 130 | 0 | 345 | 10 | 0 | 60 | 130 |
| Peak Hour Factor | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 141 | 0 | 375 | 11 | 0 | 65 | 141 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | WB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 2 | 1 |
| Conflicting Approach Left | NB | | WB |
| Conflicting Lanes Left | 1 | 0 | 2 |
| Conflicting Approach Right | SB | WB | |
| Conflicting Lanes Right | 2 | 2 | 0 |
| HCM Control Delay | 9.4 | 13.6 | 9.3 |
| HCM LOS | A | B | A |

| Lane | NBLn1 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 100% | 0% |
| Vol Thru, % | 97% | 0% | 0% | 0% | 100% |
| Vol Right, % | 3% | 0% | 100% | 0% | 0% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 355 | 10 | 130 | 60 | 130 |
| LT Vol | 345 | 0 | 0 | 0 | 130 |
| Through Vol | 10 | 0 | 130 | 0 | 0 |
| RT Vol | 0 | 10 | 0 | 60 | 0 |
| Lane Flow Rate | 386 | 11 | 141 | 65 | 141 |
| Geometry Grp | 4 | 7 | 7 | 7 | 7 |
| Degree of Util (X) | 0.533 | 0.02 | 0.207 | 0.105 | 0.207 |
| Departure Headway (Hd) | 4.97 | 6.48 | 5.268 | 5.788 | 5.284 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 722 | 550 | 677 | 616 | 675 |
| Service Time | 3.025 | 4.246 | 3.033 | 3.554 | 3.049 |
| HCM Lane V/C Ratio | 0.535 | 0.02 | 0.208 | 0.106 | 0.209 |
| HCM Control Delay | 13.6 | 9.4 | 9.4 | 9.2 | 9.4 |
| HCM Lane LOS | B | A | A | A | A |
| HCM 95th-tile Q | 3.2 | 0.1 | 0.8 | 0.4 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 4.8 |
| Intersection LOS | A |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 98 | 196 | 65 | 55 |
| Demand Flow Rate, veh/h | 100 | 199 | 66 | 56 |
| Vehicles Circulating, veh/h | 200 | 33 | 123 | 188 |
| Vehicles Exiting, veh/h | 44 | 156 | 177 | 44 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 5 | 5 | 5 | 5 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 5.0 | 5.0 | 4.3 | 4.5 |
| Approach LOS | A | A | A | A |

| Lane | Left | Left | Left | Left |
|---|---|---|---|---|
| Designated Moves | LTR | LTR | LTR | LTR |
| Assumed Moves | LTR | LTR | LTR | LTR |
| RT Channelized | | | | |
| Lane Util | 1.000 | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 100 | 199 | 66 | 56 |
| Cap Entry Lane, veh/h | 925 | 1093 | 999 | 936 |
| Entry HV Adj Factor | 0.985 | 0.983 | 0.982 | 0.978 |
| Flow Entry, veh/h | 98 | 196 | 65 | 55 |
| Cap Entry, veh/h | 910 | 1074 | 980 | 915 |
| V/C Ratio | 0.108 | 0.182 | 0.066 | 0.060 |
| Control Delay, s/veh | 5.0 | 5.0 | 4.3 | 4.5 |
| LOS | A | A | A | A |
| 95th %tile Queue, veh | 0 | 1 | 0 | 0 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.1 |
| Intersection LOS | A |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 20 | 120 | 0 | 140 | 10 | 0 | 10 | 40 |
| Peak Hour Factor | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 130 | 0 | 152 | 11 | 0 | 11 | 43 |
| Number of Lanes | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 1 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 1 | 0 | 1 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 1 | 1 |
| HCM Control Delay | 8.2 | 8.1 | 7.5 |
| HCM LOS | A | A | A |

| Lane | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|
| Vol Left, % | 14% | 0% | 20% |
| Vol Thru, % | 86% | 93% | 0% |
| Vol Right, % | 0% | 7% | 80% |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 140 | 150 | 50 |
| LT Vol | 120 | 140 | 0 |
| Through Vol | 0 | 10 | 40 |
| RT Vol | 20 | 0 | 10 |
| Lane Flow Rate | 152 | 163 | 54 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.177 | 0.186 | 0.063 |
| Departure Headway (Hd) | 4.181 | 4.104 | 4.178 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 851 | 866 | 863 |
| Service Time | 2.247 | 2.17 | 2.178 |
| HCM Lane V/C Ratio | 0.179 | 0.188 | 0.063 |
| HCM Control Delay | 8.2 | 8.1 | 7.5 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.6 | 0.7 | 0.2 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 10 | 320 | 750 | 130 | 160 | 10 |
| Number | 7 | 4 | 8 | 18 | 1 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1863 | 1863 | 1900 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 348 | 815 | 132 | 174 | 8 |
| Adj No. of Lanes | 0 | 1 | 1 | 0 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 0 |
| Cap, veh/h | 89 | 1181 | 1018 | 165 | 227 | 10 |
| Arrive On Green | 0.65 | 0.65 | 0.65 | 0.65 | 0.14 | 0.14 |
| Sat Flow, veh/h | 15 | 1814 | 1564 | 253 | 1677 | 77 |
| Grp Volume(v), veh/h | 359 | 0 | 0 | 947 | 183 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1829 | 0 | 0 | 1817 | 1764 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 17.8 | 4.7 | 0.0 |
| Cycle Q Clear(g_c), s | 3.9 | 0.0 | 0.0 | 17.8 | 4.7 | 0.0 |
| Prop In Lane | 0.03 | | | 0.14 | 0.95 | 0.04 |
| Lane Grp Cap(c), veh/h | 1270 | 0 | 0 | 1183 | 238 | 0 |
| V/C Ratio(X) | 0.28 | 0.00 | 0.00 | 0.80 | 0.77 | 0.00 |
| Avail Cap(c_a), veh/h | 1683 | 0 | 0 | 1613 | 698 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 3.5 | 0.0 | 0.0 | 5.9 | 19.5 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 2.1 | 5.2 | 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 | 2.0 | 0.0 | 0.0 | 9.4 | 2.6 | 0.0 |
| LnGrp Delay(d),s/veh | 3.6 | 0.0 | 0.0 | 8.1 | 24.7 | 0.0 |
| LnGrp LOS | A | | | A | C | |
| Approach Vol, veh/h | | 359 | 947 | | 183 | |
| Approach Delay, s/veh | | 3.6 | 8.1 | | 24.7 | |
| Approach LOS | | A | A | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | | | 35.9 | | 10.8 | | 35.9 |
| Change Period (Y+Rc), s | | | | 5.5 | | 4.5 | | 5.5 |
| Max Green Setting (Gmax), s | | | | 41.5 | | 18.5 | | 41.5 |
| Max Q Clear Time (g_c+I1), s | | | | 5.9 | | 6.7 | | 19.8 |
| Green Ext Time (p_c), s | | | | 13.4 | | 0.0 | | 10.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 9.0 |
| HCM 2010 LOS | | A |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 100 | 330 | 60 | 220 | 170 | 110 | 150 | 1330 | 430 | 170 | 1340 | 50 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 104 | 344 | 0 | 229 | 177 | 0 | 156 | 1385 | 0 | 177 | 1396 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 162 | 683 | 213 | 304 | 893 | 278 | 217 | 2690 | 838 | 238 | 2722 | 848 |
| Arrive On Green | 0.05 | 0.13 | 0.00 | 0.09 | 0.18 | 0.00 | 0.06 | 0.53 | 0.00 | 0.07 | 0.54 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 104 | 344 | 0 | 229 | 177 | 0 | 156 | 1385 | 0 | 177 | 1396 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 3.3 | 6.9 | 0.0 | 7.1 | 3.3 | 0.0 | 4.9 | 19.3 | 0.0 | 5.5 | 19.2 | 0.0 |
| Cycle Q Clear(g_c), s | 3.3 | 6.9 | 0.0 | 7.1 | 3.3 | 0.0 | 4.9 | 19.3 | 0.0 | 5.5 | 19.2 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 162 | 683 | 213 | 304 | 893 | 278 | 217 | 2690 | 838 | 238 | 2722 | 848 |
| V/C Ratio(X) | 0.64 | 0.50 | 0.00 | 0.75 | 0.20 | 0.00 | 0.72 | 0.51 | 0.00 | 0.74 | 0.51 | 0.00 |
| Avail Cap(c_a), veh/h | 689 | 1798 | 560 | 689 | 1798 | 560 | 689 | 2690 | 838 | 689 | 2722 | 848 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 51.2 | 44.0 | 0.0 | 48.7 | 38.5 | 0.0 | 50.3 | 16.7 | 0.0 | 50.0 | 16.3 | 0.0 |
| Incr Delay (d2), s/veh | 1.6 | 1.0 | 0.0 | 3.8 | 0.2 | 0.0 | 1.7 | 0.7 | 0.0 | 1.7 | 0.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 3.3 | 0.0 | 3.5 | 1.5 | 0.0 | 2.4 | 9.2 | 0.0 | 2.7 | 9.1 | 0.0 |
| LnGrp Delay(d),s/veh | 52.8 | 45.0 | 0.0 | 52.5 | 38.7 | 0.0 | 52.0 | 17.4 | 0.0 | 51.7 | 17.0 | 0.0 |
| LnGrp LOS | D | D | | D | D | | D | B | | D | B | |
| Approach Vol, veh/h | | 448 | | | 406 | | | 1541 | | | 1573 | |
| Approach Delay, s/veh | | 46.8 | | | 46.5 | | | 20.9 | | | 20.9 | |
| Approach LOS | | D | | | D | | | C | | | 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 | 12.1 | 113.7 | 9.6 | 24.5 | 11.4 | 114.4 | 14.2 | 20.0 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 21.9 | 57.9 | 21.9 | 38.7 | 21.9 | 57.9 | 21.9 | 38.7 |
| Max Q Clear Time (g_c+I1), s | 7.5 | 21.3 | 5.3 | 5.3 | 6.9 | 21.2 | 9.1 | 8.9 |
| Green Ext Time (p_c), s | 0.1 | 35.7 | 0.1 | 5.7 | 0.1 | 35.8 | 0.6 | 5.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 26.4 |
| HCM 2010 LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.2 |
| Intersection LOS | B |

| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 110 | 30 | 40 | 0 | 10 | 20 | 20 | 0 | 30 | 330 | 10 |
| Peak Hour Factor | 0.88 | 0.91 | 0.91 | 0.91 | 0.88 | 0.91 | 0.91 | 0.91 | 0.88 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 121 | 33 | 44 | 0 | 11 | 22 | 22 | 0 | 33 | 363 | 11 |
| Number of Lanes | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 |

| Approach | EB | WB | NB |
|---|---|---|---|
| Opposing Approach | WB | EB | SB |
| Opposing Lanes | 1 | 3 | 3 |
| Conflicting Approach Left | SB | NB | EB |
| Conflicting Lanes Left | 3 | 3 | 3 |
| Conflicting Approach Right | NB | SB | WB |
| Conflicting Lanes Right | 3 | 3 | 1 |
| HCM Control Delay | 10.3 | 10.4 | 12 |
| HCM LOS | B | B | B |

| Lane | NBLn1 | NBLn2 | NBLn3 | EBLn1 | EBLn2 | EBLn3 | WBLn1 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 100% | 58% | 0% | 20% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 92% | 0% | 42% | 0% | 40% | 0% | 100% | 33% |
| Vol Right, % | 0% | 0% | 8% | 0% | 0% | 100% | 40% | 0% | 0% | 67% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 30 | 220 | 120 | 69 | 71 | 40 | 50 | 20 | 100 | 150 |
| LT Vol | 0 | 220 | 110 | 0 | 30 | 0 | 20 | 0 | 100 | 50 |
| Through Vol | 0 | 0 | 10 | 0 | 0 | 40 | 20 | 0 | 0 | 100 |
| RT Vol | 30 | 0 | 0 | 69 | 41 | 0 | 10 | 20 | 0 | 0 |
| Lane Flow Rate | 33 | 242 | 132 | 76 | 78 | 44 | 55 | 22 | 110 | 165 |
| Geometry Grp | 8 | 8 | 8 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| Degree of Util (X) | 0.061 | 0.411 | 0.222 | 0.146 | 0.145 | 0.07 | 0.104 | 0.042 | 0.194 | 0.27 |
| Departure Headway (Hd) | 6.626 | 6.122 | 6.063 | 6.914 | 6.701 | 5.711 | 6.8 | 6.865 | 6.36 | 5.889 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 540 | 587 | 592 | 519 | 535 | 626 | 526 | 521 | 564 | 608 |
| Service Time | 4.369 | 3.865 | 3.806 | 4.661 | 4.448 | 3.458 | 4.557 | 4.614 | 4.109 | 3.637 |
| HCM Lane V/C Ratio | 0.061 | 0.412 | 0.223 | 0.146 | 0.146 | 0.07 | 0.105 | 0.042 | 0.195 | 0.271 |
| HCM Control Delay | 9.8 | 13.1 | 10.5 | 10.8 | 10.6 | 8.9 | 10.4 | 9.9 | 10.6 | 10.8 |
| HCM Lane LOS | A | B | B | B | B | A | B | A | B | B |
| HCM 95th-tile Q | 0.2 | 2 | 0.8 | 0.5 | 0.5 | 0.2 | 0.3 | 0.1 | 0.7 | 1.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | |
| Intersection LOS | |

| Movement | SBU | SBL | SBT | SBR |
|---|---|---|---|---|
| Vol, veh/h | 0 | 20 | 150 | 100 |
| Peak Hour Factor | 0.88 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 165 | 110 |
| Number of Lanes | 0 | 1 | 2 | 0 |

| Approach | SB |
|---|---|
| Opposing Approach | NB |
| Opposing Lanes | 3 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 1 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 3 |
| HCM Control Delay | 10.7 |
| HCM LOS | B |

| Lane |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 460 | 750 | 50 | 30 | 290 | 60 | 100 | 80 | 70 | 90 | 30 | 180 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 511 | 833 | 23 | 33 | 322 | 0 | 100 | 104 | 4 | 100 | 33 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 625 | 2865 | 891 | 63 | 2034 | 633 | 164 | 172 | 145 | 219 | 118 | 101 |
| Arrive On Green | 0.18 | 0.56 | 0.56 | 0.02 | 0.40 | 0.00 | 0.09 | 0.09 | 0.09 | 0.06 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1582 | 3442 | 5085 | 1583 | 1774 | 1863 | 1573 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 511 | 833 | 23 | 33 | 322 | 0 | 100 | 104 | 4 | 100 | 33 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1582 | 1721 | 1695 | 1583 | 1774 | 1863 | 1573 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 10.3 | 6.2 | 0.5 | 0.7 | 2.9 | 0.0 | 3.9 | 3.9 | 0.2 | 2.0 | 1.2 | 0.0 |
| Cycle Q Clear(g_c), s | 10.3 | 6.2 | 0.5 | 0.7 | 2.9 | 0.0 | 3.9 | 3.9 | 0.2 | 2.0 | 1.2 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 625 | 2865 | 891 | 63 | 2034 | 633 | 164 | 172 | 145 | 219 | 118 | 101 |
| V/C Ratio(X) | 0.82 | 0.29 | 0.03 | 0.53 | 0.16 | 0.00 | 0.61 | 0.61 | 0.03 | 0.46 | 0.28 | 0.00 |
| Avail Cap(c_a), veh/h | 1190 | 4781 | 1487 | 1190 | 4781 | 1489 | 613 | 644 | 544 | 1904 | 1030 | 876 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 28.4 | 8.2 | 7.0 | 35.2 | 13.9 | 0.0 | 31.6 | 31.6 | 29.9 | 32.7 | 32.3 | 0.0 |
| Incr Delay (d2), s/veh | 1.0 | 0.1 | 0.0 | 2.5 | 0.1 | 0.0 | 1.4 | 1.3 | 0.0 | 0.6 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.0 | 2.9 | 0.2 | 0.3 | 1.4 | 0.0 | 2.0 | 2.1 | 0.1 | 1.0 | 0.6 | 0.0 |
| LnGrp Delay(d),s/veh | 29.5 | 8.4 | 7.0 | 37.7 | 14.0 | 0.0 | 33.0 | 32.8 | 29.9 | 33.2 | 32.8 | 0.0 |
| LnGrp LOS | C | A | A | D | B | | C | C | C | C | C | |
| Approach Vol, veh/h | | 1367 | | | 355 | | | 208 | | | 133 | |
| Approach Delay, s/veh | | 16.2 | | | 16.2 | | | 32.8 | | | 33.1 | |
| 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 | 5.8 | 46.2 | | 11.2 | 17.6 | 34.4 | | 9.1 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 68.0 | | 25.0 | 25.0 | 68.0 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 2.7 | 8.2 | | 5.9 | 12.3 | 4.9 | | 4.0 |
| Green Ext Time (p_c), s | 0.0 | 23.6 | | 0.5 | 0.8 | 24.0 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.0 |
| HCM 2010 LOS | B |

## Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 170 | 340 | 645 | 420 | 130 | 140 | 610 | 1540 | 610 | 190 | 1350 | 170 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 177 | 354 | 345 | 438 | 135 | 0 | 635 | 1604 | 0 | 198 | 1406 | 0 |
| Adj No. of Lanes | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 231 | 749 | 335 | 496 | 1461 | 455 | 706 | 2185 | 680 | 253 | 1516 | 472 |
| Arrive On Green | 0.07 | 0.21 | 0.21 | 0.14 | 0.29 | 0.00 | 0.07 | 0.14 | 0.00 | 0.07 | 0.30 | 0.00 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 177 | 354 | 345 | 438 | 135 | 0 | 635 | 1604 | 0 | 198 | 1406 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 7.0 | 12.1 | 29.1 | 17.0 | 2.7 | 0.0 | 25.2 | 41.6 | 0.0 | 7.8 | 36.9 | 0.0 |
| Cycle Q Clear(g_c), s | 7.0 | 12.1 | 29.1 | 17.0 | 2.7 | 0.0 | 25.2 | 41.6 | 0.0 | 7.8 | 36.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 231 | 749 | 335 | 496 | 1461 | 455 | 706 | 2185 | 680 | 253 | 1516 | 472 |
| V/C Ratio(X) | 0.77 | 0.47 | 1.03 | 0.88 | 0.09 | 0.00 | 0.90 | 0.73 | 0.00 | 0.78 | 0.93 | 0.00 |
| Avail Cap(c_a), veh/h | 748 | 749 | 335 | 756 | 1461 | 455 | 948 | 2185 | 680 | 948 | 1608 | 501 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.38 | 0.38 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 63.1 | 47.5 | 54.2 | 57.8 | 35.9 | 0.0 | 62.7 | 51.5 | 0.0 | 62.7 | 46.8 | 0.0 |
| Incr Delay (d2), s/veh | 2.0 | 1.2 | 57.1 | 5.6 | 0.1 | 0.0 | 3.2 | 0.9 | 0.0 | 2.0 | 10.1 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.4 | 6.0 | 18.0 | 8.5 | 1.3 | 0.0 | 12.3 | 19.7 | 0.0 | 3.8 | 18.7 | 0.0 |
| LnGrp Delay(d),s/veh | 65.1 | 48.7 | 111.3 | 63.4 | 36.0 | 0.0 | 66.0 | 52.4 | 0.0 | 64.7 | 56.9 | 0.0 |
| LnGrp LOS | E | D | F | E | D | | E | D | | E | E | |
| Approach Vol, veh/h | | 876 | | | 573 | | | 2239 | | | 1604 | |
| Approach Delay, s/veh | | 76.7 | | | 56.9 | | | 56.2 | | | 57.9 | |
| Approach LOS | | E | | | E | | | E | | | E | |

| 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 | 14.6 | 86.9 | 13.7 | 44.8 | 55.1 | 46.3 | 24.1 | 34.4 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 37.9 | 43.5 | 29.9 | 29.1 | 37.9 | 43.5 | 29.9 | 29.1 |
| Max Q Clear Time (g_c+I1), s | 9.8 | 43.6 | 9.0 | 4.7 | 27.2 | 38.9 | 19.0 | 31.1 |
| Green Ext Time (p_c), s | 0.3 | 0.0 | 0.3 | 9.4 | 1.0 | 2.1 | 0.6 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 60.2 |
| HCM 2010 LOS | E |

**Notes**

User approved ignoring U-Turning movement.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.9 |
| Intersection LOS | B |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 370 | 120 | 0 | 60 | 10 | 0 | 10 | 140 |
| Peak Hour Factor | 0.79 | 0.86 | 0.86 | 0.79 | 0.86 | 0.86 | 0.79 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 430 | 140 | 0 | 70 | 12 | 0 | 12 | 163 |
| Number of Lanes | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 2 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 3 | 3 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 3 | 0 | 3 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 3 | 3 |
| HCM Control Delay | 16.4 | 9.2 | 7.9 |
| HCM LOS | C | A | A |

| Lane | EBLn1 | EBLn2 | EBLn3 | WBLn1 | WBLn2 | WBLn3 | SBLn1 | SBLn2 | SBLn3 |
|---|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% |
| Vol Thru, % | 0% | 100% | 100% | 100% | 100% | 67% | 0% | 0% | 0% |
| Vol Right, % | 0% | 0% | 0% | 0% | 0% | 33% | 0% | 100% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 370 | 60 | 60 | 0 | 40 | 30 | 10 | 70 | 70 |
| LT Vol | 0 | 60 | 60 | 0 | 40 | 20 | 0 | 0 | 0 |
| Through Vol | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 70 | 70 |
| RT Vol | 370 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| Lane Flow Rate | 430 | 70 | 70 | 0 | 47 | 35 | 12 | 81 | 81 |
| Geometry Grp | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 |
| Degree of Util (X) | 0.672 | 0.099 | 0.066 | 0 | 0.079 | 0.057 | 0.021 | 0.122 | 0.083 |
| Departure Headway (Hd) | 5.626 | 5.125 | 3.386 | 6.079 | 6.079 | 5.844 | 6.594 | 5.392 | 3.656 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 637 | 693 | 1042 | 0 | 584 | 607 | 542 | 662 | 972 |
| Service Time | 3.399 | 2.897 | 1.158 | 3.868 | 3.868 | 3.634 | 4.349 | 3.147 | 1.409 |
| HCM Lane V/C Ratio | 0.675 | 0.101 | 0.067 | 0 | 0.08 | 0.058 | 0.022 | 0.122 | 0.083 |
| HCM Control Delay | 19.3 | 8.5 | 6.4 | 8.9 | 9.4 | 9 | 9.5 | 8.9 | 6.7 |
| HCM Lane LOS | C | A | A | N | A | A | A | A | A |
| HCM 95th-tile Q | 5.1 | 0.3 | 0.2 | 0 | 0.3 | 0.2 | 0.1 | 0.4 | 0.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 490 | 0 | 2270 | 110 | 300 | 1465 | 730 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.98 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4707 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4707 | 1362 |
| Peak-hour factor, 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 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 510 | 0 | 2365 | 115 | 312 | 1526 | 760 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 22 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 475 | 0 | 2365 | 93 | 312 | 1769 | 517 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 52.4 | | 87.0 | 87.0 | 52.4 | 160.0 | 160.0 |
| Effective Green, g (s) | | | | | | 52.4 | | 87.0 | 87.0 | 52.4 | 160.0 | 160.0 |
| Actuated g/C Ratio | | | | | | 0.33 | | 0.54 | 0.54 | 0.33 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 527 | | 2764 | 860 | 579 | 4707 | 1362 |
| v/s Ratio Prot | | | | | | c0.29 | | c0.47 | | 0.18 | 0.38 | |
| v/s Ratio Perm | | | | | | | | | 0.06 | | | 0.38 |
| v/c Ratio | | | | | | 0.90 | | 0.86 | 0.11 | 0.54 | 0.38 | 0.38 |
| Uniform Delay, d1 | | | | | | 51.3 | | 31.1 | 17.7 | 43.9 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 1.00 | 1.00 | 0.62 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 18.2 | | 3.7 | 0.3 | 0.2 | 0.1 | 0.3 |
| Delay (s) | | | | | | 69.5 | | 34.8 | 17.9 | 27.4 | 0.1 | 0.3 |
| Level of Service | | | | | | E | | C | B | C | A | A |
| Approach Delay (s) | | 0.0 | | | 69.5 | | | 34.0 | | | 3.4 | |
| Approach LOS | | A | | | E | | | C | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 160.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 82.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 70 | 1000 | 1380 | 200 | 0 | 1465 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 73 | 1003 | 1438 | 0 | 0 | 1526 |
| Adj No. of Lanes | 2 | 2 | 2 | 1 | 0 | 3 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 1253 | 1015 | 1935 | 822 | 0 | 2641 |
| Arrive On Green | 0.36 | 0.36 | 0.52 | 0.00 | 0.00 | 0.52 |
| Sat Flow, veh/h | 3442 | 2787 | 3725 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 73 | 1003 | 1438 | 0 | 0 | 1526 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1863 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 1.1 | 29.5 | 24.9 | 0.0 | 0.0 | 17.0 |
| Cycle Q Clear(g_c), s | 1.1 | 29.5 | 24.9 | 0.0 | 0.0 | 17.0 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 1253 | 1015 | 1935 | 822 | 0 | 2641 |
| V/C Ratio(X) | 0.06 | 0.99 | 0.74 | 0.00 | 0.00 | 0.58 |
| Avail Cap(c_a), veh/h | 1253 | 1015 | 2261 | 961 | 0 | 3086 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.0 | 26.0 | 15.5 | 0.0 | 0.0 | 13.6 |
| Incr Delay (d2), s/veh | 0.0 | 25.3 | 0.9 | 0.0 | 0.0 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 14.9 | 13.0 | 0.0 | 0.0 | 7.9 |
| LnGrp Delay(d),s/veh | 17.0 | 51.4 | 16.4 | 0.0 | 0.0 | 13.7 |
| LnGrp LOS | B | D | B | | | B |
| Approach Vol, veh/h | 1076 | | 1438 | | | 1526 |
| Approach Delay, s/veh | 49.0 | | 16.4 | | | 13.7 |
| Approach LOS | D | | B | | | B |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 48.1 | | | | 48.1 | | 34.3 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 50.0 | | | | 50.0 | | 30.0 |
| Max Q Clear Time (g_c+I1), s | | 26.9 | | | | 19.0 | | 31.5 |
| Green Ext Time (p_c), s | | 15.9 | | | | 19.3 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 24.1 |
| HCM 2010 LOS | | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 1100 | 0 | 185 | 0 | 0 | 0 | 0 | 480 | 200 | 0 | 335 | 1200 |
| 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 | 1111 | 0 | 96 | | | | 0 | 485 | 0 | 0 | 338 | 0 |
| Adj No. of Lanes | 2 | 0 | 1 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1427 | 0 | 657 | | | | 0 | 996 | 446 | 0 | 1048 | 446 |
| Arrive On Green | 0.41 | 0.00 | 0.41 | | | | 0.00 | 0.28 | 0.00 | 0.00 | 0.28 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 1583 | | | | 0 | 3632 | 1583 | 0 | 3725 | 1583 |
| Grp Volume(v), veh/h | 1111 | 0 | 96 | | | | 0 | 485 | 0 | 0 | 338 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1583 | | | | 0 | 1770 | 1583 | 0 | 1863 | 1583 |
| Q Serve(g_s), s | 8.8 | 0.0 | 1.2 | | | | 0.0 | 3.6 | 0.0 | 0.0 | 2.3 | 0.0 |
| Cycle Q Clear(g_c), s | 8.8 | 0.0 | 1.2 | | | | 0.0 | 3.6 | 0.0 | 0.0 | 2.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1427 | 0 | 657 | | | | 0 | 996 | 446 | 0 | 1048 | 446 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.15 | | | | 0.00 | 0.49 | 0.00 | 0.00 | 0.32 | 0.00 |
| Avail Cap(c_a), veh/h | 2723 | 0 | 1253 | | | | 0 | 5041 | 2255 | 0 | 5307 | 2255 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 8.0 | 0.0 | 5.8 | | | | 0.0 | 9.5 | 0.0 | 0.0 | 9.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 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 | 4.1 | 0.0 | 0.5 | | | | 0.0 | 1.8 | 0.0 | 0.0 | 1.1 | 0.0 |
| LnGrp Delay(d),s/veh | 8.3 | 0.0 | 5.8 | | | | 0.0 | 9.6 | 0.0 | 0.0 | 9.0 | 0.0 |
| LnGrp LOS | A | | A | | | | | A | | | A | |
| Approach Vol, veh/h | | 1207 | | | | | | 485 | | | 338 | |
| Approach Delay, s/veh | | 8.1 | | | | | | 9.6 | | | 9.0 | |
| Approach LOS | | A | | | | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 14.2 | | 17.4 | | 14.2 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 45.0 | | * 25 | | 45.0 | | |
| Max Q Clear Time (g_c+I1), s | | 5.6 | | 10.8 | | 4.3 | | |
| Green Ext Time (p_c), s | | 3.4 | | 2.3 | | 3.4 | | |

| 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 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 170 | 60 | 330 | 150 | 90 | 100 | 1050 | 1370 | 310 | 60 | 530 | 400 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 173 | 61 | 104 | 173 | 65 | 8 | 1071 | 1398 | 304 | 61 | 541 | 154 |
| Adj No. of Lanes | 0 | 1 | 1 | 2 | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 1 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 201 | 71 | 239 | 310 | 142 | 18 | 1376 | 1552 | 331 | 124 | 720 | 306 |
| Arrive On Green | 0.15 | 0.15 | 0.15 | 0.09 | 0.09 | 0.09 | 0.40 | 0.53 | 0.53 | 0.07 | 0.19 | 0.19 |
| Sat Flow, veh/h | 1328 | 468 | 1583 | 3548 | 1627 | 200 | 3442 | 2903 | 619 | 1774 | 3725 | 1583 |
| Grp Volume(v), veh/h | 234 | 0 | 104 | 173 | 0 | 73 | 1071 | 841 | 861 | 61 | 541 | 154 |
| Grp Sat Flow(s),veh/h/ln | 1796 | 0 | 1583 | 1774 | 0 | 1827 | 1721 | 1770 | 1752 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 14.5 | 0.0 | 6.8 | 5.3 | 0.0 | 4.3 | 31.0 | 48.1 | 51.4 | 3.8 | 15.7 | 9.9 |
| Cycle Q Clear(g_c), s | 14.5 | 0.0 | 6.8 | 5.3 | 0.0 | 4.3 | 31.0 | 48.1 | 51.4 | 3.8 | 15.7 | 9.9 |
| Prop In Lane | 0.74 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.35 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 272 | 0 | 239 | 310 | 0 | 160 | 1376 | 946 | 937 | 124 | 720 | 306 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.43 | 0.56 | 0.00 | 0.46 | 0.78 | 0.89 | 0.92 | 0.49 | 0.75 | 0.50 |
| Avail Cap(c_a), veh/h | 424 | 0 | 374 | 497 | 0 | 256 | 1467 | 946 | 937 | 217 | 720 | 306 |
| 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 | 47.3 | 0.0 | 44.1 | 50.0 | 0.0 | 49.6 | 29.9 | 23.6 | 24.3 | 51.2 | 43.5 | 41.2 |
| Incr Delay (d2), s/veh | 6.5 | 0.0 | 0.5 | 0.6 | 0.0 | 0.8 | 2.3 | 12.2 | 15.4 | 1.1 | 7.1 | 5.8 |
| 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 | 7.7 | 0.0 | 3.0 | 2.6 | 0.0 | 2.2 | 15.2 | 26.6 | 28.6 | 1.9 | 8.7 | 4.9 |
| LnGrp Delay(d),s/veh | 53.8 | 0.0 | 44.5 | 50.6 | 0.0 | 50.3 | 32.1 | 35.8 | 39.7 | 52.3 | 50.6 | 47.0 |
| LnGrp LOS | D | | D | D | | D | C | D | D | D | D | D |
| Approach Vol, veh/h | | 338 | | | 246 | | | 2773 | | | 756 | |
| Approach Delay, s/veh | | 51.0 | | | 50.5 | | | 35.6 | | | 50.0 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 12.0 | 88.1 | | 21.9 | 72.7 | 27.4 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 5.3 | * 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 14.0 | 61.1 | | 27.0 | 48.7 | * 22 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | 5.8 | 53.4 | | 16.5 | 33.0 | 17.7 | | 7.3 |
| Green Ext Time (p_c), s | 0.0 | 6.5 | | 0.8 | 11.8 | 1.1 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 40.4 |
| HCM 2010 LOS | D |

**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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 820 | 0 | 0 | 930 | 0 | 1800 | 740 | 210 | 800 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1546 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1546 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 0 | 0 | 837 | 0 | 0 | 949 | 0 | 1837 | 755 | 214 | 816 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 263 | 0 | 0 | 0 | 0 | 0 | 256 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 574 | 0 | 0 | 949 | 0 | 1837 | 499 | 214 | 816 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 4 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 23.1 | | | 100.6 | | 45.2 | 45.2 | 18.0 | 67.2 | |
| Effective Green, g (s) | | | 23.1 | | | 100.6 | | 45.2 | 45.2 | 18.0 | 67.2 | |
| Actuated g/C Ratio | | | 0.23 | | | 1.00 | | 0.45 | 0.45 | 0.18 | 0.67 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 639 | | | 1591 | | 2284 | 694 | 316 | 4280 | |
| v/s Ratio Prot | | | c0.21 | | | | | c0.36 | | 0.12 | 0.13 | |
| v/s Ratio Perm | | | | | | c0.60 | | | 0.32 | | | |
| v/c Ratio | | | 0.90 | | | 0.60 | | 0.80 | 0.72 | 0.68 | 0.19 | |
| Uniform Delay, d1 | | | 37.6 | | | 0.0 | | 23.9 | 22.5 | 38.6 | 6.4 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 14.9 | | | 1.7 | | 3.1 | 6.3 | 5.1 | 0.1 | |
| Delay (s) | | | 52.5 | | | 1.7 | | 27.0 | 28.9 | 43.7 | 6.5 | |
| Level of Service | | | D | | | A | | C | C | D | A | |
| Approach Delay (s) | | 52.5 | | | 1.7 | | | 27.6 | | | 14.2 | |
| Approach LOS | | D | | | A | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 24.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 100.6 | Sum of lost time (s) | 14.3 |
| Intersection Capacity Utilization | 66.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 35.8 |
| Intersection LOS | E |

| Movement | EBU | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NBU | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 490 | 260 | 0 | 0 | 0 | 260 | 110 | 0 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.92 | 0.92 | 0.96 | 0.82 | 0.96 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 533 | 283 | 0 | 0 | 0 | 283 | 120 | 0 | 0 | 0 | 0 |
| Number of Lanes | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| Approach | EB | WB |
|---|---|---|
| Opposing Approach | WB | EB |
| Opposing Lanes | 1 | 2 |
| Conflicting Approach Left | SB | |
| Conflicting Lanes Left | 1 | 0 |
| Conflicting Approach Right | | SB |
| Conflicting Lanes Right | 0 | 1 |
| HCM Control Delay | 48.9 | 22.5 |
| HCM LOS | E | C |

| Lane | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 0% | 40% |
| Vol Thru, % | 0% | 100% | 70% | 0% |
| Vol Right, % | 0% | 0% | 30% | 60% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 490 | 260 | 370 | 350 |
| LT Vol | 0 | 260 | 260 | 0 |
| Through Vol | 0 | 0 | 110 | 210 |
| RT Vol | 490 | 0 | 0 | 140 |
| Lane Flow Rate | 533 | 283 | 402 | 380 |
| Geometry Grp | 7 | 7 | 5 | 2 |
| Degree of Util (X) | 1 | 0.512 | 0.7 | 0.68 |
| Departure Headway (Hd) | 7.029 | 6.518 | 6.268 | 6.438 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 511 | 548 | 583 | 571 |
| Service Time | 4.818 | 4.307 | 4.23 | 4.389 |
| HCM Lane V/C Ratio | 1.043 | 0.516 | 0.69 | 0.665 |
| HCM Control Delay | 66.4 | 16 | 22.5 | 21.9 |
| HCM Lane LOS | F | C | C | C |
| HCM 95th-tile Q | 13.8 | 2.9 | 5.6 | 5.2 |

| Intersection | | | | |
|---|---|---|---|---|
| Intersection Delay, s/veh | | | | |
| Intersection LOS | | | | |

| Movement | SBU | SBL | SBT | SBR |
|---|---|---|---|---|
| Vol, veh/h | 0 | 140 | 0 | 210 |
| Peak Hour Factor | 0.82 | 0.92 | 0.96 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 152 | 0 | 228 |
| Number of Lanes | 0 | 1 | 0 | 0 |

| Approach | SB |
|---|---|
| Opposing Approach | |
| Opposing Lanes | 0 |
| Conflicting Approach Left | WB |
| Conflicting Lanes Left | 1 |
| Conflicting Approach Right | EB |
| Conflicting Lanes Right | 2 |
| HCM Control Delay | 21.9 |
| HCM LOS | C |

| Lane |
|---|

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 390 | 0 | 0 | 350 | 310 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Yield | Yield | Yield |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 415 | 0 | 0 | 372 | 330 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 702 | 0 | 0 | 415 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 895 | - | - | 1144 | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Platoon blocked, % | | - | - | | - | - |
| Mov Cap-1 Maneuver | 895 | - | - | 1144 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 0.2 | 0 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 895 | - | - | 1144 | - | - | 239 |
| HCM Lane V/C Ratio | 0.012 | - | - | - | - | - | 0.601 |
| HCM Control Delay (s) | 9.1 | 0 | - | 0 | - | - | 40.4 |
| HCM Lane LOS | A | A | - | A | - | - | E |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - | - | 3.5 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 120 | 5 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 128 | 5 | 11 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 973 | 973 | 537 |
| Stage 1 | 537 | 537 | - |
| Stage 2 | 436 | 436 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 231 | 252 | 544 |
| Stage 1 | 528 | 523 | - |
| Stage 2 | 599 | 580 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 228 | 248 | 544 |
| Mov Cap-2 Maneuver | 228 | 248 | - |
| Stage 1 | 520 | 523 | - |
| Stage 2 | 589 | 571 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 40.4 |
| HCM LOS | E |

| Minor Lane/Major Mvmt |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 340 | 270 | 80 | 150 | 150 | 240 | 100 | 1070 | 320 | 320 | 450 | 280 |
| 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 | | 0.99 | 1.00 | | 0.99 | 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 | 1845 | 1854 | 1900 | 1863 | 1863 | 1863 | 1810 | 1810 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 370 | 293 | 62 | 163 | 163 | 25 | 109 | 1163 | 277 | 348 | 489 | 106 |
| Adj No. of Lanes | 2 | 2 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 3 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 462 | 519 | 108 | 239 | 399 | 176 | 137 | 2476 | 621 | 435 | 2260 | 694 |
| Arrive On Green | 0.14 | 0.18 | 0.18 | 0.07 | 0.11 | 0.11 | 0.08 | 0.40 | 0.40 | 0.13 | 0.44 | 0.44 |
| Sat Flow, veh/h | 3408 | 2899 | 604 | 3442 | 3539 | 1562 | 1723 | 6225 | 1562 | 3442 | 5085 | 1562 |
| Grp Volume(v), veh/h | 370 | 176 | 179 | 163 | 163 | 25 | 109 | 1163 | 277 | 348 | 489 | 106 |
| Grp Sat Flow(s),veh/h/ln | 1704 | 1762 | 1742 | 1721 | 1770 | 1562 | 1723 | 1556 | 1562 | 1721 | 1695 | 1562 |
| Q Serve(g_s), s | 10.4 | 9.0 | 9.3 | 4.6 | 4.2 | 1.4 | 6.1 | 13.7 | 12.8 | 9.7 | 5.8 | 4.0 |
| Cycle Q Clear(g_c), s | 10.4 | 9.0 | 9.3 | 4.6 | 4.2 | 1.4 | 6.1 | 13.7 | 12.8 | 9.7 | 5.8 | 4.0 |
| Prop In Lane | 1.00 | | 0.35 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 462 | 315 | 312 | 239 | 399 | 176 | 137 | 2476 | 621 | 435 | 2260 | 694 |
| V/C Ratio(X) | 0.80 | 0.56 | 0.57 | 0.68 | 0.41 | 0.14 | 0.79 | 0.47 | 0.45 | 0.80 | 0.22 | 0.15 |
| Avail Cap(c_a), veh/h | 828 | 663 | 656 | 662 | 1511 | 667 | 279 | 2476 | 621 | 697 | 2260 | 694 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.4 | 37.0 | 37.1 | 44.9 | 40.8 | 39.5 | 44.7 | 22.0 | 21.8 | 42.0 | 16.9 | 16.4 |
| Incr Delay (d2), s/veh | 3.3 | 1.6 | 1.7 | 3.4 | 0.7 | 0.4 | 9.9 | 0.6 | 2.3 | 3.5 | 0.2 | 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 | 5.1 | 4.5 | 4.6 | 2.3 | 2.1 | 0.6 | 3.3 | 6.0 | 5.9 | 4.8 | 2.8 | 1.8 |
| LnGrp Delay(d),s/veh | 44.7 | 38.6 | 38.8 | 48.3 | 41.4 | 39.9 | 54.6 | 22.7 | 24.1 | 45.4 | 17.1 | 16.8 |
| LnGrp LOS | D | D | D | D | D | D | D | C | C | D | B | B |
| Approach Vol, veh/h | | 725 | | | 351 | | | 1549 | | | 943 | |
| Approach Delay, s/veh | | 41.7 | | | 44.5 | | | 25.2 | | | 27.5 | |
| Approach LOS | | D | | | D | | | C | | | 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 | 17.5 | 45.0 | 12.9 | 23.5 | 12.9 | 49.6 | 19.4 | 17.0 |
| Change Period (Y+Rc), s | 5.0 | 5.7 | 6.0 | * 5.8 | 5.0 | 5.7 | 6.0 | 5.8 |
| Max Green Setting (Gmax), s | 20.0 | 39.3 | 19.0 | * 37 | 16.0 | 43.3 | 24.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 11.7 | 15.7 | 6.6 | 11.3 | 8.1 | 7.8 | 12.4 | 6.2 |
| Green Ext Time (p_c), s | 0.8 | 14.4 | 0.4 | 3.0 | 0.1 | 18.1 | 1.0 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 31.1 |
| HCM 2010 LOS | C |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 60 | 650 | 430 | 10 | 340 | 20 | 320 | 50 | 30 | 20 | 20 | 30 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 65 | 699 | 193 | 11 | 366 | 7 | 383 | 0 | 4 | 22 | 22 | 0 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 82 | 2473 | 770 | 12 | 2271 | 698 | 525 | 0 | 234 | 43 | 45 | 38 |
| Arrive On Green | 0.05 | 0.49 | 0.49 | 0.01 | 0.45 | 0.45 | 0.15 | 0.00 | 0.15 | 0.02 | 0.02 | 0.00 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 65 | 699 | 193 | 11 | 366 | 7 | 383 | 0 | 4 | 22 | 22 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 2.2 | 4.9 | 4.3 | 0.4 | 2.6 | 0.1 | 6.2 | 0.0 | 0.1 | 0.7 | 0.7 | 0.0 |
| Cycle Q Clear(g_c), s | 2.2 | 4.9 | 4.3 | 0.4 | 2.6 | 0.1 | 6.2 | 0.0 | 0.1 | 0.7 | 0.7 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 82 | 2473 | 770 | 12 | 2271 | 698 | 525 | 0 | 234 | 43 | 45 | 38 |
| V/C Ratio(X) | 0.79 | 0.28 | 0.25 | 0.94 | 0.16 | 0.01 | 0.73 | 0.00 | 0.02 | 0.51 | 0.49 | 0.00 |
| Avail Cap(c_a), veh/h | 743 | 3322 | 1034 | 743 | 3408 | 1048 | 1486 | 0 | 663 | 743 | 780 | 663 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 28.2 | 9.1 | 9.0 | 29.6 | 9.8 | 9.2 | 24.3 | 0.0 | 21.7 | 28.8 | 28.8 | 0.0 |
| Incr Delay (d2), s/veh | 6.3 | 0.2 | 0.6 | 58.9 | 0.1 | 0.0 | 0.7 | 0.0 | 0.0 | 3.5 | 3.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 2.3 | 2.0 | 0.4 | 1.2 | 0.1 | 3.0 | 0.0 | 0.1 | 0.4 | 0.4 | 0.0 |
| LnGrp Delay(d),s/veh | 34.5 | 9.4 | 9.6 | 88.6 | 10.0 | 9.2 | 25.0 | 0.0 | 21.7 | 32.2 | 31.8 | 0.0 |
| LnGrp LOS | C | A | A | F | A | A | C | | C | C | C | |
| Approach Vol, veh/h | | 957 | | | 384 | | | 387 | | | 44 | |
| Approach Delay, s/veh | | 11.1 | | | 12.2 | | | 25.0 | | | 32.0 | |
| 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 | 7.3 | 33.2 | | 5.9 | 4.9 | 35.5 | | 13.3 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | 40.0 | | 25.0 | 25.0 | * 39 | | 25.0 |
| Max Q Clear Time (g_c+I1), s | 4.2 | 4.6 | | 2.7 | 2.4 | 6.9 | | 8.2 |
| Green Ext Time (p_c), s | 0.0 | 22.1 | | 0.1 | 0.0 | 20.7 | | 0.7 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 14.9 |
| 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. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 530 | 60 | 30 | 200 | 10 | 130 | 30 | 60 | 10 | 20 | 40 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 112 | 541 | 22 | 31 | 204 | 3 | 133 | 31 | 17 | 10 | 20 | 6 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 146 | 1916 | 597 | 62 | 1677 | 522 | 241 | 304 | 259 | 37 | 67 | 20 |
| Arrive On Green | 0.08 | 0.38 | 0.38 | 0.04 | 0.33 | 0.33 | 0.14 | 0.16 | 0.16 | 0.02 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1377 | 413 |
| Grp Volume(v), veh/h | 112 | 541 | 22 | 31 | 204 | 3 | 133 | 31 | 17 | 10 | 0 | 26 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1790 |
| Q Serve(g_s), s | 3.1 | 3.7 | 0.4 | 0.8 | 1.4 | 0.1 | 3.5 | 0.7 | 0.4 | 0.3 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | 3.1 | 3.7 | 0.4 | 0.8 | 1.4 | 0.1 | 3.5 | 0.7 | 0.4 | 0.3 | 0.0 | 0.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 146 | 1916 | 597 | 62 | 1677 | 522 | 241 | 304 | 259 | 37 | 0 | 87 |
| V/C Ratio(X) | 0.77 | 0.28 | 0.04 | 0.50 | 0.12 | 0.01 | 0.55 | 0.10 | 0.07 | 0.27 | 0.00 | 0.30 |
| Avail Cap(c_a), veh/h | 896 | 6983 | 2174 | 896 | 7086 | 2206 | 896 | 1505 | 1279 | 896 | 0 | 1446 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.3 | 10.8 | 9.7 | 23.5 | 11.6 | 11.1 | 20.0 | 17.6 | 17.5 | 23.9 | 0.0 | 22.7 |
| Incr Delay (d2), s/veh | 3.2 | 0.2 | 0.1 | 2.3 | 0.1 | 0.0 | 2.0 | 0.1 | 0.1 | 3.9 | 0.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 1.7 | 0.2 | 0.5 | 0.7 | 0.0 | 1.8 | 0.4 | 0.2 | 0.2 | 0.0 | 0.4 |
| LnGrp Delay(d),s/veh | 25.5 | 11.0 | 9.8 | 25.7 | 11.7 | 11.2 | 22.0 | 17.8 | 17.6 | 27.8 | 0.0 | 24.6 |
| LnGrp LOS | C | B | A | C | B | B | C | B | B | C | | C |
| Approach Vol, veh/h | | 675 | | | 238 | | | 181 | | | 36 | |
| Approach Delay, s/veh | | 13.3 | | | 13.5 | | | 20.8 | | | 25.5 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 6.2 | 25.2 | 11.2 | 6.9 | 8.6 | 22.8 | 5.5 | 12.6 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 25.0 | * 68 | 25.0 | 40.0 | 25.0 | 69.0 | 25.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 2.8 | 5.7 | 5.5 | 2.7 | 5.1 | 3.4 | 2.3 | 2.7 |
| Green Ext Time (p_c), s | 0.0 | 13.0 | 0.3 | 0.4 | 0.1 | 13.1 | 0.0 | 0.4 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 15.0 |
| HCM 2010 LOS | | | B |

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

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 26.9 |
| Intersection LOS | D |

| Movement | WBU | WBL | WBR | NBU | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 15 | 200 | 0 | 480 | 40 | 0 | 185 | 335 |
| Peak Hour Factor | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 16 | 217 | 0 | 522 | 43 | 0 | 201 | 364 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | WB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 2 | 1 |
| Conflicting Approach Left | NB | | WB |
| Conflicting Lanes Left | 1 | 0 | 2 |
| Conflicting Approach Right | SB | WB | |
| Conflicting Lanes Right | 2 | 2 | 0 |
| HCM Control Delay | 13.5 | 42.9 | 16.4 |
| HCM LOS | B | E | C |

| Lane | NBLn1 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 100% | 0% |
| Vol Thru, % | 92% | 0% | 0% | 0% | 100% |
| Vol Right, % | 8% | 0% | 100% | 0% | 0% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 520 | 15 | 200 | 185 | 335 |
| LT Vol | 480 | 0 | 0 | 0 | 335 |
| Through Vol | 40 | 0 | 200 | 0 | 0 |
| RT Vol | 0 | 15 | 0 | 185 | 0 |
| Lane Flow Rate | 565 | 16 | 217 | 201 | 364 |
| Geometry Grp | 4 | 7 | 7 | 7 | 7 |
| Degree of Util (X) | 0.917 | 0.036 | 0.399 | 0.369 | 0.616 |
| Departure Headway (Hd) | 5.841 | 7.843 | 6.614 | 6.6 | 6.091 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 622 | 455 | 541 | 543 | 590 |
| Service Time | 3.887 | 5.61 | 4.379 | 4.356 | 3.847 |
| HCM Lane V/C Ratio | 0.908 | 0.035 | 0.401 | 0.37 | 0.617 |
| HCM Control Delay | 42.9 | 10.9 | 13.7 | 13.2 | 18.2 |
| HCM Lane LOS | E | B | B | B | C |
| HCM 95th-tile Q | 11.7 | 0.1 | 1.9 | 1.7 | 4.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 3.9 |
| Intersection LOS | A |

| Approach | EB | NB | SB |
|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 44 | 54 | 98 |
| Demand Flow Rate, veh/h | 45 | 55 | 100 |
| Vehicles Circulating, veh/h | 34 | 34 | 11 |
| Vehicles Exiting, veh/h | 77 | 45 | 78 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 5 | 5 | 5 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 3.7 | 3.8 | 4.0 |
| Approach LOS | A | A | A |

| Lane | Left | Left | Left |
|---|---|---|---|
| Designated Moves | LR | LT | TR |
| Assumed Moves | LR | LT | TR |
| RT Channelized | | | |
| Lane Util | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 45 | 55 | 100 |
| Cap Entry Lane, veh/h | 1092 | 1092 | 1118 |
| Entry HV Adj Factor | 0.978 | 0.984 | 0.983 |
| Flow Entry, veh/h | 44 | 54 | 98 |
| Cap Entry, veh/h | 1067 | 1074 | 1098 |
| V/C Ratio | 0.041 | 0.050 | 0.090 |
| Control Delay, s/veh | 3.7 | 3.8 | 4.0 |
| LOS | A | A | A |
| 95th %tile Queue, veh | 0 | 0 | 0 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.6 |
| Intersection LOS | B |

| Movement | WBU | WBL | WBR | NBU | NBT | NBR | SBU | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 20 | 70 | 0 | 310 | 10 | 0 | 110 | 115 |
| Peak Hour Factor | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 76 | 0 | 337 | 11 | 0 | 120 | 125 |
| Number of Lanes | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | WB | NB | SB |
|---|---|---|---|
| Opposing Approach | | SB | NB |
| Opposing Lanes | 0 | 2 | 1 |
| Conflicting Approach Left | NB | | WB |
| Conflicting Lanes Left | 1 | 0 | 2 |
| Conflicting Approach Right | SB | WB | |
| Conflicting Lanes Right | 2 | 2 | 0 |
| HCM Control Delay | 8.9 | 12.1 | 9.2 |
| HCM LOS | A | B | A |

| Lane | NBLn1 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 0% | 100% | 0% | 100% | 0% |
| Vol Thru, % | 97% | 0% | 0% | 0% | 100% |
| Vol Right, % | 3% | 0% | 100% | 0% | 0% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 320 | 20 | 70 | 110 | 115 |
| LT Vol | 310 | 0 | 0 | 0 | 115 |
| Through Vol | 10 | 0 | 70 | 0 | 0 |
| RT Vol | 0 | 20 | 0 | 110 | 0 |
| Lane Flow Rate | 348 | 22 | 76 | 120 | 125 |
| Geometry Grp | 4 | 7 | 7 | 7 | 7 |
| Degree of Util (X) | 0.469 | 0.039 | 0.111 | 0.186 | 0.177 |
| Departure Headway (Hd) | 4.859 | 6.452 | 5.24 | 5.588 | 5.085 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 741 | 554 | 681 | 641 | 704 |
| Service Time | 2.896 | 4.205 | 2.993 | 3.329 | 2.825 |
| HCM Lane V/C Ratio | 0.47 | 0.04 | 0.112 | 0.187 | 0.178 |
| HCM Control Delay | 12.1 | 9.5 | 8.7 | 9.6 | 8.9 |
| HCM Lane LOS | B | A | A | A | A |
| HCM 95th-tile Q | 2.5 | 0.1 | 0.4 | 0.7 | 0.6 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 4.5 |
| Intersection LOS | A |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 87 | 152 | 98 | 44 |
| Demand Flow Rate, veh/h | 88 | 156 | 100 | 44 |
| Vehicles Circulating, veh/h | 111 | 33 | 99 | 133 |
| Vehicles Exiting, veh/h | 66 | 166 | 100 | 56 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 5 | 5 | 5 | 5 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 4.4 | 4.7 | 4.5 | 4.1 |
| Approach LOS | A | A | A | A |

| Lane | Left | Left | Left | Left |
|---|---|---|---|---|
| Designated Moves | LTR | LTR | LTR | LTR |
| Assumed Moves | LTR | LTR | LTR | LTR |
| RT Channelized | | | | |
| Lane Util | 1.000 | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 88 | 156 | 100 | 44 |
| Cap Entry Lane, veh/h | 1011 | 1093 | 1023 | 989 |
| Entry HV Adj Factor | 0.985 | 0.975 | 0.978 | 0.995 |
| Flow Entry, veh/h | 87 | 152 | 98 | 44 |
| Cap Entry, veh/h | 996 | 1065 | 1000 | 984 |
| V/C Ratio | 0.087 | 0.143 | 0.098 | 0.045 |
| Control Delay, s/veh | 4.4 | 4.7 | 4.5 | 4.1 |
| LOS | A | A | A | A |
| 95th %tile Queue, veh | 0 | 0 | 0 | 0 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8 |
| Intersection LOS | A |

| Movement | EBU | EBL | EBT | WBU | WBT | WBR | SBU | SBL | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 0 | 40 | 110 | 0 | 120 | 10 | 0 | 10 | 20 |
| Peak Hour Factor | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 | 0.96 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 43 | 120 | 0 | 130 | 11 | 0 | 11 | 22 |
| Number of Lanes | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | SB |
|---|---|---|---|
| Opposing Approach | WB | EB | |
| Opposing Lanes | 1 | 1 | 0 |
| Conflicting Approach Left | SB | | WB |
| Conflicting Lanes Left | 1 | 0 | 1 |
| Conflicting Approach Right | | SB | EB |
| Conflicting Lanes Right | 0 | 1 | 1 |
| HCM Control Delay | 8.2 | 7.9 | 7.4 |
| HCM LOS | A | A | A |

| Lane | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|
| Vol Left, % | 27% | 0% | 33% |
| Vol Thru, % | 73% | 92% | 0% |
| Vol Right, % | 0% | 8% | 67% |
| Sign Control | Stop | Stop | Stop |
| Traffic Vol by Lane | 150 | 130 | 30 |
| LT Vol | 110 | 120 | 0 |
| Through Vol | 0 | 10 | 20 |
| RT Vol | 40 | 0 | 10 |
| Lane Flow Rate | 163 | 141 | 33 |
| Geometry Grp | 1 | 1 | 1 |
| Degree of Util (X) | 0.188 | 0.16 | 0.039 |
| Departure Headway (Hd) | 4.151 | 4.067 | 4.258 |
| Convergence, Y/N | Yes | Yes | Yes |
| Cap | 859 | 875 | 846 |
| Service Time | 2.2 | 2.124 | 2.258 |
| HCM Lane V/C Ratio | 0.19 | 0.161 | 0.039 |
| HCM Control Delay | 8.2 | 7.9 | 7.4 |
| HCM Lane LOS | A | A | A |
| HCM 95th-tile Q | 0.7 | 0.6 | 0.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 10 | 500 | 650 | 160 | 120 | 10 |
| Number | 7 | 4 | 8 | 18 | 1 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1863 | 1863 | 1900 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 543 | 707 | 163 | 130 | 6 |
| Adj No. of Lanes | 0 | 1 | 1 | 0 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 0 |
| Cap, veh/h | 93 | 1208 | 965 | 223 | 176 | 8 |
| Arrive On Green | 0.66 | 0.66 | 0.66 | 0.66 | 0.10 | 0.10 |
| Sat Flow, veh/h | 10 | 1833 | 1464 | 338 | 1673 | 77 |
| Grp Volume(v), veh/h | 554 | 0 | 0 | 870 | 137 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1843 | 0 | 0 | 1802 | 1763 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 13.5 | 3.2 | 0.0 |
| Cycle Q Clear(g_c), s | 6.1 | 0.0 | 0.0 | 13.5 | 3.2 | 0.0 |
| Prop In Lane | 0.02 | | | 0.19 | 0.95 | 0.04 |
| Lane Grp Cap(c), veh/h | 1302 | 0 | 0 | 1188 | 185 | 0 |
| V/C Ratio(X) | 0.43 | 0.00 | 0.00 | 0.73 | 0.74 | 0.00 |
| Avail Cap(c_a), veh/h | 1875 | 0 | 0 | 1763 | 769 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 3.5 | 0.0 | 0.0 | 4.8 | 18.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 0.9 | 5.7 | 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 | 3.2 | 0.0 | 0.0 | 6.8 | 1.9 | 0.0 |
| LnGrp Delay(d),s/veh | 3.7 | 0.0 | 0.0 | 5.7 | 24.1 | 0.0 |
| LnGrp LOS | A | | | A | C | |
| Approach Vol, veh/h | | 554 | 870 | | 137 | |
| Approach Delay, s/veh | | 3.7 | 5.7 | | 24.1 | |
| Approach LOS | | A | A | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | | | 33.5 | | 9.0 | | 33.5 |
| Change Period (Y+Rc), s | | | | 5.5 | | 4.5 | | 5.5 |
| Max Green Setting (Gmax), s | | | | 41.5 | | 18.5 | | 41.5 |
| Max Q Clear Time (g_c+I1), s | | | | 8.1 | | 5.2 | | 15.5 |
| Green Ext Time (p_c), s | | | | 14.0 | | 0.0 | | 12.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.6 |
| HCM 2010 LOS | A |

Notes

User approved volume balancing among the lanes for turning movement.

# **Cumulative No Project Conditions**

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 80 | 60 | 310 | 360 | 240 | 20 | 1520 | 190 | 280 | 1490 | 20 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 22 | 87 | 0 | 337 | 391 | 0 | 22 | 1652 | 0 | 304 | 1620 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 41 | 391 | 122 | 403 | 925 | 288 | 40 | 2659 | 828 | 364 | 3101 | 965 |
| Arrive On Green | 0.01 | 0.08 | 0.00 | 0.12 | 0.18 | 0.00 | 0.01 | 0.52 | 0.00 | 0.11 | 0.61 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 22 | 87 | 0 | 337 | 391 | 0 | 22 | 1652 | 0 | 304 | 1620 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 0.7 | 1.8 | 0.0 | 10.6 | 7.5 | 0.0 | 0.7 | 25.3 | 0.0 | 9.6 | 20.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.7 | 1.8 | 0.0 | 10.6 | 7.5 | 0.0 | 0.7 | 25.3 | 0.0 | 9.6 | 20.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 41 | 391 | 122 | 403 | 925 | 288 | 40 | 2659 | 828 | 364 | 3101 | 965 |
| V/C Ratio(X) | 0.53 | 0.22 | 0.00 | 0.84 | 0.42 | 0.00 | 0.55 | 0.62 | 0.00 | 0.84 | 0.52 | 0.00 |
| Avail Cap(c_a), veh/h | 112 | 1428 | 445 | 577 | 2115 | 658 | 87 | 2659 | 828 | 514 | 3101 | 965 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 54.2 | 47.9 | 0.0 | 47.7 | 40.0 | 0.0 | 54.3 | 18.6 | 0.0 | 48.4 | 12.3 | 0.0 |
| Incr Delay (d2), s/veh | 3.9 | 0.5 | 0.0 | 5.0 | 0.5 | 0.0 | 4.4 | 1.1 | 0.0 | 5.8 | 0.6 | 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 | 0.4 | 0.8 | 0.0 | 5.3 | 3.6 | 0.0 | 0.4 | 12.0 | 0.0 | 4.9 | 9.5 | 0.0 |
| LnGrp Delay(d),s/veh | 58.1 | 48.3 | 0.0 | 52.7 | 40.5 | 0.0 | 58.6 | 19.7 | 0.0 | 54.2 | 13.0 | 0.0 |
| LnGrp LOS | E | D | | D | D | | E | B | | D | B | |
| Approach Vol, veh/h | | 109 | | | 728 | | | 1674 | | | 1924 | |
| Approach Delay, s/veh | | 50.3 | | | 46.2 | | | 20.2 | | | 19.5 | |
| Approach LOS | | D | | | D | | | 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 | 16.2 | 92.6 | 5.8 | 25.4 | 36.2 | 72.6 | 17.4 | 13.8 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 5.3 | * 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 16.5 | 54.4 | 3.6 | 45.9 | 2.8 | * 67 | 18.5 | 31.0 |
| Max Q Clear Time (g_c+I1), s | 11.6 | 27.3 | 2.7 | 9.5 | 2.7 | 22.1 | 12.6 | 3.8 |
| Green Ext Time (p_c), s | 0.1 | 23.2 | 0.0 | 5.3 | 0.0 | 35.2 | 0.3 | 5.0 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 24.9 |
| HCM 2010 LOS | | | C |

| Notes |
|---|
| User approved pedestrian interval to be less than phase max green. |
| * HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 20 | 180 | 60 | 40 | 20 | 290 | 690 | 10 | 30 | 870 | 270 |
| 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 98 | 22 | 59 | 65 | 43 | 14 | 315 | 750 | 9 | 33 | 946 | 216 |
| Adj No. of Lanes | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 199 | 404 | 343 | 0 | 112 | 37 | 377 | 2728 | 33 | 52 | 1421 | 323 |
| Arrive On Green | 0.06 | 0.22 | 0.22 | 0.00 | 0.08 | 0.08 | 0.21 | 0.53 | 0.53 | 0.03 | 0.34 | 0.34 |
| Sat Flow, veh/h | 3442 | 1863 | 1579 | 0 | 1343 | 437 | 1774 | 5179 | 62 | 1774 | 4141 | 943 |
| Grp Volume(v), veh/h | 98 | 22 | 59 | 0 | 0 | 57 | 315 | 491 | 268 | 33 | 774 | 388 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1579 | 0 | 0 | 1780 | 1774 | 1695 | 1851 | 1774 | 1695 | 1693 |
| Q Serve(g_s), s | 1.5 | 0.5 | 1.6 | 0.0 | 0.0 | 1.6 | 9.0 | 4.2 | 4.2 | 1.0 | 10.3 | 10.3 |
| Cycle Q Clear(g_c), s | 1.5 | 0.5 | 1.6 | 0.0 | 0.0 | 1.6 | 9.0 | 4.2 | 4.2 | 1.0 | 10.3 | 10.3 |
| Prop In Lane | 1.00 | | 1.00 | 0.00 | | 0.25 | 1.00 | | 0.03 | 1.00 | | 0.56 |
| Lane Grp Cap(c), veh/h | 199 | 404 | 343 | 0 | 0 | 149 | 377 | 1785 | 975 | 52 | 1163 | 581 |
| V/C Ratio(X) | 0.49 | 0.05 | 0.17 | 0.00 | 0.00 | 0.38 | 0.84 | 0.27 | 0.28 | 0.64 | 0.67 | 0.67 |
| Avail Cap(c_a), veh/h | 261 | 705 | 598 | 0 | 0 | 674 | 504 | 1926 | 1051 | 168 | 1284 | 641 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.1 | 16.4 | 16.8 | 0.0 | 0.0 | 22.9 | 19.9 | 6.9 | 6.9 | 25.4 | 14.8 | 14.8 |
| Incr Delay (d2), s/veh | 1.9 | 0.1 | 0.2 | 0.0 | 0.0 | 1.6 | 8.9 | 0.1 | 0.2 | 12.5 | 1.2 | 2.3 |
| 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 | 0.3 | 0.7 | 0.0 | 0.0 | 0.9 | 5.3 | 2.0 | 2.2 | 0.6 | 4.9 | 5.1 |
| LnGrp Delay(d),s/veh | 26.0 | 16.4 | 17.1 | 0.0 | 0.0 | 24.5 | 28.8 | 7.0 | 7.1 | 37.8 | 15.9 | 17.1 |
| LnGrp LOS | C | B | B | | | C | C | A | A | D | B | B |
| Approach Vol, veh/h | | 179 | | | 57 | | | 1074 | | | 1195 | |
| Approach Delay, s/veh | | 21.9 | | | 24.5 | | | 13.4 | | | 16.9 | |
| 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 | 5.5 | 31.8 | 0.0 | 15.5 | 15.2 | 22.1 | 7.1 | 8.4 |
| 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 | 5.0 | 30.0 | 4.0 | 20.0 | 15.0 | 20.0 | 4.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 3.0 | 6.2 | 0.0 | 3.6 | 11.0 | 12.3 | 3.5 | 3.6 |
| Green Ext Time (p_c), s | 0.0 | 13.2 | 0.0 | 0.4 | 0.4 | 5.8 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 550 | 190 | 90 | 600 | 30 | 90 | 10 | 10 | 60 | 50 | 350 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 129 | 591 | 73 | 97 | 645 | 0 | 105 | 0 | 0 | 65 | 54 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 0 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 222 | 2113 | 657 | 174 | 2041 | 636 | 228 | 0 | 102 | 235 | 127 | 108 |
| Arrive On Green | 0.06 | 0.42 | 0.42 | 0.05 | 0.40 | 0.00 | 0.06 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1581 | 3442 | 5085 | 1583 | 3548 | 0 | 1583 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 129 | 591 | 73 | 97 | 645 | 0 | 105 | 0 | 0 | 65 | 54 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1581 | 1721 | 1695 | 1583 | 1774 | 0 | 1583 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 1.7 | 3.6 | 1.3 | 1.3 | 4.1 | 0.0 | 1.4 | 0.0 | 0.0 | 0.8 | 1.3 | 0.0 |
| Cycle Q Clear(g_c), s | 1.7 | 3.6 | 1.3 | 1.3 | 4.1 | 0.0 | 1.4 | 0.0 | 0.0 | 0.8 | 1.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 222 | 2113 | 657 | 174 | 2041 | 636 | 228 | 0 | 102 | 235 | 127 | 108 |
| V/C Ratio(X) | 0.58 | 0.28 | 0.11 | 0.56 | 0.32 | 0.00 | 0.46 | 0.00 | 0.00 | 0.28 | 0.42 | 0.00 |
| Avail Cap(c_a), veh/h | 356 | 2545 | 791 | 385 | 2588 | 806 | 2473 | 0 | 1103 | 2471 | 1338 | 1137 |
| 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 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 21.5 | 9.2 | 8.5 | 22.0 | 9.7 | 0.0 | 21.4 | 0.0 | 0.0 | 20.9 | 21.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.2 | 0.2 | 1.0 | 0.2 | 0.0 | 0.5 | 0.0 | 0.0 | 0.2 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 1.7 | 0.6 | 0.6 | 2.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.4 | 0.7 | 0.0 |
| LnGrp Delay(d),s/veh | 22.4 | 9.3 | 8.7 | 23.0 | 9.9 | 0.0 | 21.9 | 0.0 | 0.0 | 21.2 | 22.0 | 0.0 |
| LnGrp LOS | C | A | A | C | A | | C | | | C | C | |
| Approach Vol, veh/h | | 793 | | | 742 | | | 105 | | | 119 | |
| Approach Delay, s/veh | | 11.4 | | | 11.6 | | | 21.9 | | | 21.6 | |
| 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 | 6.9 | 25.2 | | 7.5 | 7.6 | 24.5 | | 7.7 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 5.3 | 23.7 | | 33.0 | 4.9 | 24.1 | | 34.0 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 5.6 | | 3.4 | 3.7 | 6.1 | | 3.3 |
| Green Ext Time (p_c), s | 0.0 | 12.8 | | 0.2 | 0.0 | 12.8 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.8 |
| HCM 2010 LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 190 | 330 | 570 | 510 | 410 | 780 | 1320 | 240 | 270 | 1240 | 60 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 95 | 200 | 22 | 600 | 537 | 0 | 821 | 1389 | 0 | 284 | 1305 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 144 | 554 | 172 | 653 | 1297 | 404 | 893 | 2285 | 711 | 341 | 1469 | 457 |
| Arrive On Green | 0.04 | 0.11 | 0.11 | 0.19 | 0.26 | 0.00 | 0.09 | 0.15 | 0.00 | 0.10 | 0.29 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 95 | 200 | 22 | 600 | 537 | 0 | 821 | 1389 | 0 | 284 | 1305 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 3.4 | 4.6 | 1.6 | 21.4 | 11.1 | 0.0 | 29.9 | 32.3 | 0.0 | 10.3 | 31.0 | 0.0 |
| Cycle Q Clear(g_c), s | 3.4 | 4.6 | 1.6 | 21.4 | 11.1 | 0.0 | 29.9 | 32.3 | 0.0 | 10.3 | 31.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 144 | 554 | 172 | 653 | 1297 | 404 | 893 | 2285 | 711 | 341 | 1469 | 457 |
| V/C Ratio(X) | 0.66 | 0.36 | 0.13 | 0.92 | 0.41 | 0.00 | 0.92 | 0.61 | 0.00 | 0.83 | 0.89 | 0.00 |
| Avail Cap(c_a), veh/h | 223 | 844 | 263 | 701 | 1540 | 479 | 985 | 2285 | 711 | 492 | 1516 | 472 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.45 | 0.45 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 59.7 | 52.3 | 50.9 | 50.4 | 39.2 | 0.0 | 56.5 | 43.4 | 0.0 | 56.0 | 43.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.9 | 1.0 | 0.8 | 15.9 | 0.6 | 0.0 | 6.1 | 0.5 | 0.0 | 5.5 | 7.3 | 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 | 1.7 | 2.2 | 0.7 | 11.8 | 5.3 | 0.0 | 15.1 | 15.3 | 0.0 | 5.1 | 15.5 | 0.0 |
| LnGrp Delay(d),s/veh | 61.7 | 53.3 | 51.7 | 66.3 | 39.9 | 0.0 | 62.7 | 44.0 | 0.0 | 61.4 | 50.3 | 0.0 |
| LnGrp LOS | E | D | D | E | D | | E | D | | E | D | |
| Approach Vol, veh/h | | 317 | | | 1137 | | | 2210 | | | 1589 | |
| Approach Delay, s/veh | | 55.7 | | | 53.8 | | | 50.9 | | | 52.3 | |
| Approach LOS | | E | | | D | | | D | | | 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 | 17.0 | 75.6 | 9.8 | 37.6 | 50.8 | 41.8 | 28.3 | 19.1 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 18.1 | 55.8 | 8.2 | 38.3 | 36.2 | 37.7 | 25.5 | 21.0 |
| Max Q Clear Time (g_c+I1), s | 12.3 | 34.3 | 5.4 | 13.1 | 31.9 | 33.0 | 23.4 | 6.6 |
| Green Ext Time (p_c), s | 0.3 | 20.8 | 0.0 | 10.0 | 0.9 | 3.5 | 0.3 | 7.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 52.3 |
| HCM 2010 LOS | | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 460 | 370 | 120 | 760 | 250 | 960 | 580 | 60 | 300 | 810 | 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 | | 0.98 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 94 | 479 | 267 | 125 | 792 | 235 | 1000 | 604 | 18 | 312 | 844 | 14 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 68 | 521 | 289 | 111 | 701 | 208 | 710 | 1604 | 498 | 464 | 900 | 279 |
| Arrive On Green | 0.04 | 0.24 | 0.24 | 0.06 | 0.26 | 0.26 | 0.40 | 0.32 | 0.32 | 0.26 | 0.18 | 0.18 |
| Sat Flow, veh/h | 1774 | 2196 | 1218 | 1774 | 2681 | 795 | 1774 | 5085 | 1580 | 1774 | 5085 | 1578 |
| Grp Volume(v), veh/h | 94 | 386 | 360 | 125 | 523 | 504 | 1000 | 604 | 18 | 312 | 844 | 14 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1644 | 1774 | 1770 | 1707 | 1774 | 1695 | 1580 | 1774 | 1695 | 1578 |
| Q Serve(g_s), s | 5.0 | 27.6 | 27.8 | 8.1 | 34.0 | 34.0 | 52.0 | 12.0 | 0.8 | 20.5 | 21.3 | 1.0 |
| Cycle Q Clear(g_c), s | 5.0 | 27.6 | 27.8 | 8.1 | 34.0 | 34.0 | 52.0 | 12.0 | 0.8 | 20.5 | 21.3 | 1.0 |
| Prop In Lane | 1.00 | | 0.74 | 1.00 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 68 | 420 | 390 | 111 | 463 | 447 | 710 | 1604 | 498 | 464 | 900 | 279 |
| V/C Ratio(X) | 1.38 | 0.92 | 0.92 | 1.13 | 1.13 | 1.13 | 1.41 | 0.38 | 0.04 | 0.67 | 0.94 | 0.05 |
| Avail Cap(c_a), veh/h | 68 | 436 | 405 | 111 | 463 | 447 | 710 | 1604 | 498 | 464 | 900 | 279 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 62.5 | 48.3 | 48.4 | 60.9 | 48.0 | 48.0 | 39.0 | 34.6 | 20.7 | 43.0 | 52.8 | 44.4 |
| Incr Delay (d2), s/veh | 238.5 | 23.8 | 26.2 | 123.6 | 82.2 | 83.0 | 192.5 | 0.7 | 0.1 | 7.6 | 18.3 | 0.3 |
| 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 | 7.0 | 16.3 | 15.5 | 7.8 | 27.2 | 26.3 | 63.4 | 5.7 | 0.5 | 11.0 | 11.5 | 0.4 |
| LnGrp Delay(d),s/veh | 301.0 | 72.1 | 74.6 | 184.6 | 130.2 | 131.0 | 231.5 | 35.2 | 20.8 | 50.6 | 71.1 | 44.8 |
| LnGrp LOS | F | E | E | F | F | F | F | D | C | D | E | D |
| Approach Vol, veh/h | | 840 | | | 1152 | | | 1622 | | | 1170 | |
| Approach Delay, s/veh | | 98.8 | | | 136.5 | | | 156.1 | | | 65.3 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| 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 | 38.0 | 45.0 | 12.1 | 34.9 | 56.0 | 27.0 | 9.0 | 38.0 |
| 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 | 34.0 | 41.0 | 7.0 | 32.0 | 52.0 | 23.0 | 5.0 | 34.0 |
| Max Q Clear Time (g_c+I1), s | 22.5 | 14.0 | 10.1 | 29.8 | 54.0 | 23.3 | 7.0 | 36.0 |
| Green Ext Time (p_c), s | 0.7 | 10.9 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 119.1 |
| HCM 2010 LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 570 | 0 | 1770 | 200 | 500 | 970 | 890 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.95 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4579 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4579 | 1362 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 613 | 0 | 1903 | 215 | 538 | 1043 | 957 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 56 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 576 | 0 | 1903 | 159 | 538 | 1522 | 478 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 53.2 | | 66.2 | 66.2 | 53.2 | 140.0 | 140.0 |
| Effective Green, g (s) | | | | | | 53.2 | | 66.2 | 66.2 | 53.2 | 140.0 | 140.0 |
| Actuated g/C Ratio | | | | | | 0.38 | | 0.47 | 0.47 | 0.38 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 612 | | 2404 | 748 | 672 | 4579 | 1362 |
| v/s Ratio Prot | | | | | | c0.36 | | c0.37 | | 0.30 | 0.33 | |
| v/s Ratio Perm | | | | | | | | | 0.10 | | | c0.35 |
| v/c Ratio | | | | | | 0.94 | | 0.79 | 0.21 | 0.80 | 0.33 | 0.35 |
| Uniform Delay, d1 | | | | | | 41.9 | | 31.1 | 21.6 | 38.7 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 0.93 | 1.05 | 0.31 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 22.7 | | 2.0 | 0.4 | 4.5 | 0.1 | 0.5 |
| Delay (s) | | | | | | 64.6 | | 30.9 | 23.0 | 16.4 | 0.1 | 0.5 |
| Level of Service | | | | | | E | | C | C | B | A | A |
| Approach Delay (s) | | 0.0 | | | 64.6 | | | 30.1 | | | 3.6 | |
| Approach LOS | | A | | | E | | | C | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 78.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 410 | 470 | 1500 | 220 | 0 | 970 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 441 | 487 | 1613 | 0 | 0 | 1043 |
| Adj No. of Lanes | 2 | 2 | 3 | 1 | 0 | 3 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 787 | 637 | 3072 | 957 | 0 | 3072 |
| Arrive On Green | 0.23 | 0.23 | 1.00 | 0.00 | 0.00 | 0.60 |
| Sat Flow, veh/h | 3442 | 2787 | 5253 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 441 | 487 | 1613 | 0 | 0 | 1043 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1695 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 6.5 | 9.4 | 0.0 | 0.0 | 0.0 | 5.9 |
| Cycle Q Clear(g_c), s | 6.5 | 9.4 | 0.0 | 0.0 | 0.0 | 5.9 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 787 | 637 | 3072 | 957 | 0 | 3072 |
| V/C Ratio(X) | 0.56 | 0.76 | 0.52 | 0.00 | 0.00 | 0.34 |
| Avail Cap(c_a), veh/h | 1540 | 1247 | 3072 | 957 | 0 | 3072 |
| HCM Platoon Ratio | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.84 | 0.00 | 0.00 | 0.95 |
| Uniform Delay (d), s/veh | 19.6 | 20.7 | 0.0 | 0.0 | 0.0 | 5.7 |
| Incr Delay (d2), s/veh | 0.2 | 0.7 | 0.5 | 0.0 | 0.0 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 3.6 | 0.2 | 0.0 | 0.0 | 2.8 |
| LnGrp Delay(d),s/veh | 19.8 | 21.4 | 0.5 | 0.0 | 0.0 | 5.9 |
| LnGrp LOS | B | C | A | | | A |
| Approach Vol, veh/h | 928 | | 1613 | | | 1043 |
| Approach Delay, s/veh | 20.7 | | 0.5 | | | 5.9 |
| Approach LOS | C | | A | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 52.6 | | | | 52.6 | | 17.4 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 34.7 | | | | 34.7 | | 25.7 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | | 7.9 | | 11.4 |
| Green Ext Time (p_c), s | | 17.0 | | | | 15.3 | | 1.8 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 7.3 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 710 | 0 | 630 | 0 | 0 | 0 | 0 | 1010 | 470 | 0 | 1260 | 120 |
| 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 | 772 | 0 | 658 | | | | 0 | 1098 | 0 | 0 | 1370 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1037 | 0 | 839 | | | | 0 | 2707 | 843 | 0 | 2707 | 843 |
| Arrive On Green | 0.30 | 0.00 | 0.30 | | | | 0.00 | 0.53 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 772 | 0 | 658 | | | | 0 | 1098 | 0 | 0 | 1370 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 11.7 | 0.0 | 12.5 | | | | 0.0 | 7.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.7 | 0.0 | 12.5 | | | | 0.0 | 7.4 | 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 | 1037 | 0 | 839 | | | | 0 | 2707 | 843 | 0 | 2707 | 843 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.78 | | | | 0.00 | 0.41 | 0.00 | 0.00 | 0.51 | 0.00 |
| Avail Cap(c_a), veh/h | 1772 | 0 | 1435 | | | | 0 | 2707 | 843 | 0 | 2707 | 843 |
| 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 | 0.93 | 0.00 |
| Uniform Delay (d), s/veh | 18.2 | 0.0 | 18.4 | | | | 0.0 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 0.6 | | | | 0.0 | 0.5 | 0.0 | 0.0 | 0.6 | 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 |
| %ile BackOfQ(50%),veh/ln | 5.5 | 0.0 | 4.8 | | | | 0.0 | 3.6 | 0.0 | 0.0 | 0.2 | 0.0 |
| LnGrp Delay(d),s/veh | 18.6 | 0.0 | 19.1 | | | | 0.0 | 8.5 | 0.0 | 0.0 | 0.6 | 0.0 |
| LnGrp LOS | B | | B | | | | | A | | | A | |
| Approach Vol, veh/h | | 1430 | | | | | | 1098 | | | 1370 | |
| Approach Delay, s/veh | | 18.8 | | | | | | 8.5 | | | 0.6 | |
| 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 | | 48.3 | | 21.7 | | 48.3 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 30.7 | | * 30 | | 30.7 | | |
| Max Q Clear Time (g_c+I1), s | | 9.4 | | 14.5 | | 2.0 | | |
| Green Ext Time (p_c), s | | 12.2 | | 2.9 | | 14.4 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 9.5 |
| HCM 2010 LOS | | | A |

Notes

User approved pedestrian interval to be less than phase max green.

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 200 | 40 | 710 | 50 | 80 | 150 | 280 | 910 | 110 | 150 | 1330 | 570 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 215 | 277 | 414 | 47 | 96 | 0 | 301 | 978 | 106 | 161 | 1430 | 319 |
| Adj No. of Lanes | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 226 | 291 | 449 | 128 | 268 | 0 | 265 | 1919 | 207 | 184 | 2400 | 680 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.07 | 0.07 | 0.00 | 0.08 | 0.41 | 0.41 | 0.10 | 0.43 | 0.43 |
| Sat Flow, veh/h | 797 | 1026 | 1583 | 1774 | 3725 | 0 | 3442 | 4659 | 504 | 1774 | 5588 | 1583 |
| Grp Volume(v), veh/h | 492 | 0 | 414 | 47 | 96 | 0 | 301 | 711 | 373 | 161 | 1430 | 319 |
| Grp Sat Flow(s),veh/h/ln | 1823 | 0 | 1583 | 1774 | 1863 | 0 | 1721 | 1695 | 1772 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 36.8 | 0.0 | 35.3 | 3.5 | 3.4 | 0.0 | 10.7 | 21.7 | 21.8 | 12.4 | 27.3 | 20.0 |
| Cycle Q Clear(g_c), s | 36.8 | 0.0 | 35.3 | 3.5 | 3.4 | 0.0 | 10.7 | 21.7 | 21.8 | 12.4 | 27.3 | 20.0 |
| Prop In Lane | 0.44 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.28 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 517 | 0 | 449 | 128 | 268 | 0 | 265 | 1396 | 730 | 184 | 2400 | 680 |
| V/C Ratio(X) | 0.95 | 0.00 | 0.92 | 0.37 | 0.36 | 0.00 | 1.14 | 0.51 | 0.51 | 0.87 | 0.60 | 0.47 |
| Avail Cap(c_a), veh/h | 530 | 0 | 460 | 128 | 268 | 0 | 265 | 1396 | 730 | 204 | 2400 | 680 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.9 | 0.0 | 48.3 | 61.5 | 61.4 | 0.0 | 64.2 | 30.4 | 30.4 | 61.4 | 30.4 | 28.3 |
| Incr Delay (d2), s/veh | 26.8 | 0.0 | 23.3 | 0.7 | 0.3 | 0.0 | 97.1 | 1.3 | 2.5 | 27.6 | 1.1 | 2.3 |
| 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 | 22.4 | 0.0 | 18.3 | 1.7 | 1.8 | 0.0 | 8.6 | 10.4 | 11.2 | 7.5 | 14.3 | 9.2 |
| LnGrp Delay(d),s/veh | 75.7 | 0.0 | 71.6 | 62.1 | 61.7 | 0.0 | 161.2 | 31.8 | 33.0 | 89.0 | 31.5 | 30.6 |
| LnGrp LOS | E | | E | E | E | | F | C | C | F | C | C |
| Approach Vol, veh/h | | 906 | | | 143 | | | 1385 | | | 1910 | |
| Approach Delay, s/veh | | 73.8 | | | 61.9 | | | 60.2 | | | 36.2 | |
| Approach LOS | | E | | | E | | | 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 | 18.5 | 63.5 | | 44.0 | 17.0 | 65.0 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 5.3 | * 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 16.0 | 55.7 | | 40.4 | 10.7 | * 60 | | 10.0 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 23.8 | | 38.8 | 12.7 | 29.3 | | 5.5 |
| Green Ext Time (p_c), s | 0.0 | 8.3 | | 0.6 | 0.0 | 8.2 | | 0.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 52.6 |
| HCM 2010 LOS | | D |

**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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 590 | 0 | 0 | 230 | 0 | 1070 | 470 | 110 | 1980 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1544 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1544 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 634 | 0 | 0 | 247 | 0 | 1151 | 505 | 118 | 2129 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 618 | 0 | 0 | 247 | 0 | 1151 | 425 | 118 | 2129 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 5 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 35.7 | | | 140.0 | | 114.1 | 114.1 | 16.2 | 94.0 | |
| Effective Green, g (s) | | | 35.7 | | | 140.0 | | 114.1 | 114.1 | 16.2 | 94.0 | |
| Actuated g/C Ratio | | | 0.26 | | | 1.00 | | 0.81 | 0.81 | 0.12 | 0.67 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 710 | | | 1591 | | 4144 | 1258 | 204 | 4302 | |
| v/s Ratio Prot | | | c0.22 | | | | | 0.23 | | 0.07 | c0.33 | |
| v/s Ratio Perm | | | | | | 0.16 | | | 0.28 | | | |
| v/c Ratio | | | 0.87 | | | 0.16 | | 0.28 | 0.34 | 0.58 | 0.49 | |
| Uniform Delay, d1 | | | 49.9 | | | 0.0 | | 3.1 | 3.3 | 58.7 | 11.3 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.07 | 0.39 | |
| Incremental Delay, d2 | | | 11.0 | | | 0.2 | | 0.2 | 0.7 | 1.8 | 0.2 | |
| Delay (s) | | | 61.0 | | | 0.2 | | 3.3 | 4.0 | 64.5 | 4.6 | |
| Level of Service | | | E | | | A | | A | A | E | A | |
| Approach Delay (s) | | 61.0 | | | 0.2 | | | 3.5 | | | 7.8 | |
| Approach LOS | | E | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 57.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 600 | 840 | 0 | 0 | 960 | 20 | 10 | 20 | 10 | 130 | 0 | 400 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 625 | 875 | 0 | 0 | 1000 | 5 | 10 | 21 | 1 | 135 | 0 | 47 |
| Adj No. of Lanes | 2 | 2 | 1 | 1 | 3 | 1 | 0 | 2 | 1 | 2 | 0 | 2 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 772 | 2213 | 990 | 3 | 1683 | 523 | 83 | 190 | 120 | 311 | 0 | 276 |
| Arrive On Green | 0.22 | 0.63 | 0.00 | 0.00 | 0.33 | 0.33 | 0.08 | 0.08 | 0.08 | 0.09 | 0.00 | 0.09 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 1774 | 5085 | 1580 | 1089 | 2489 | 1571 | 3548 | 0 | 3145 |
| Grp Volume(v), veh/h | 625 | 875 | 0 | 0 | 1000 | 5 | 17 | 14 | 1 | 135 | 0 | 47 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1774 | 1695 | 1580 | 1808 | 1770 | 1571 | 1774 | 0 | 1573 |
| Q Serve(g_s), s | 9.8 | 7.0 | 0.0 | 0.0 | 9.3 | 0.1 | 0.5 | 0.4 | 0.0 | 2.1 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | 9.8 | 7.0 | 0.0 | 0.0 | 9.3 | 0.1 | 0.5 | 0.4 | 0.0 | 2.1 | 0.0 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.60 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 772 | 2213 | 990 | 3 | 1683 | 523 | 138 | 135 | 120 | 311 | 0 | 276 |
| V/C Ratio(X) | 0.81 | 0.40 | 0.00 | 0.00 | 0.59 | 0.01 | 0.12 | 0.11 | 0.01 | 0.43 | 0.00 | 0.17 |
| Avail Cap(c_a), veh/h | 966 | 2213 | 990 | 125 | 2052 | 638 | 825 | 807 | 717 | 1805 | 0 | 1600 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.0 | 5.3 | 0.0 | 0.0 | 15.9 | 12.8 | 24.5 | 24.5 | 24.3 | 24.7 | 0.0 | 24.1 |
| Incr Delay (d2), s/veh | 4.2 | 0.1 | 0.0 | 0.0 | 0.3 | 0.0 | 0.4 | 0.3 | 0.0 | 1.0 | 0.0 | 0.3 |
| 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 | 5.1 | 3.4 | 0.0 | 0.0 | 4.4 | 0.1 | 0.3 | 0.2 | 0.0 | 1.1 | 0.0 | 0.4 |
| LnGrp Delay(d),s/veh | 25.2 | 5.4 | 0.0 | 0.0 | 16.2 | 12.8 | 24.9 | 24.9 | 24.4 | 25.6 | 0.0 | 24.4 |
| LnGrp LOS | C | A | | | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 1500 | | | 1005 | | | 32 | | | 182 | |
| Approach Delay, s/veh | | 13.7 | | | 16.2 | | | 24.9 | | | 25.3 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | 3 | 4 | | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 8.4 | 0.0 | 39.6 | | 9.0 | 16.8 | 22.9 |
| Change Period (Y+Rc), s | | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Max Green Setting (Gmax), s | | 26.0 | 4.0 | 35.0 | | 29.0 | 16.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | | 2.5 | 0.0 | 9.0 | | 4.1 | 11.8 | 11.3 |
| Green Ext Time (p_c), s | | 0.1 | 0.0 | 13.5 | | 0.6 | 1.0 | 7.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.5 |
| HCM 2010 LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 940 | 10 | 10 | 840 | 480 | 10 | 20 | 10 | 450 | 10 | 130 |
| 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 32 | 1000 | 10 | 11 | 894 | 133 | 11 | 21 | 4 | 479 | 11 | 68 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 3 | 1 | 0 | 1 | 0 | 2 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 51 | 1444 | 14 | 20 | 1957 | 608 | 0 | 136 | 26 | 630 | 79 | 487 |
| Arrive On Green | 0.03 | 0.40 | 0.40 | 0.01 | 0.38 | 0.38 | 0.00 | 0.09 | 0.09 | 0.18 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1774 | 3590 | 36 | 1774 | 5085 | 1579 | 0 | 1520 | 289 | 3442 | 225 | 1390 |
| Grp Volume(v), veh/h | 32 | 493 | 517 | 11 | 894 | 133 | 0 | 0 | 25 | 479 | 0 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1856 | 1774 | 1695 | 1579 | 0 | 0 | 1809 | 1721 | 0 | 1615 |
| Q Serve(g_s), s | 0.9 | 11.7 | 11.7 | 0.3 | 6.7 | 2.9 | 0.0 | 0.0 | 0.6 | 6.7 | 0.0 | 1.7 |
| Cycle Q Clear(g_c), s | 0.9 | 11.7 | 11.7 | 0.3 | 6.7 | 2.9 | 0.0 | 0.0 | 0.6 | 6.7 | 0.0 | 1.7 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 0.00 | | 0.16 | 1.00 | | 0.86 |
| Lane Grp Cap(c), veh/h | 51 | 712 | 747 | 20 | 1957 | 608 | 0 | 0 | 161 | 630 | 0 | 566 |
| V/C Ratio(X) | 0.63 | 0.69 | 0.69 | 0.55 | 0.46 | 0.22 | 0.00 | 0.00 | 0.15 | 0.76 | 0.00 | 0.14 |
| Avail Cap(c_a), veh/h | 139 | 800 | 839 | 139 | 2298 | 714 | 0 | 0 | 889 | 812 | 0 | 1047 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.5 | 12.6 | 12.6 | 25.0 | 11.7 | 10.5 | 0.0 | 0.0 | 21.4 | 19.7 | 0.0 | 11.3 |
| Incr Delay (d2), s/veh | 12.2 | 2.2 | 2.1 | 21.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.4 | 3.2 | 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 | 0.6 | 6.1 | 6.3 | 0.3 | 3.1 | 1.3 | 0.0 | 0.0 | 0.3 | 3.5 | 0.0 | 0.8 |
| LnGrp Delay(d),s/veh | 36.6 | 14.8 | 14.7 | 46.3 | 11.8 | 10.7 | 0.0 | 0.0 | 21.8 | 22.9 | 0.0 | 11.4 |
| LnGrp LOS | D | B | B | D | B | B | | | C | C | | B |
| Approach Vol, veh/h | | 1042 | | | 1038 | | | 25 | | | 558 | |
| Approach Delay, s/veh | | 15.5 | | | 12.1 | | | 21.8 | | | 21.3 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 13.3 | 8.5 | 4.6 | 24.5 | 0.0 | 21.8 | 5.5 | 23.6 |
| 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 | 12.0 | 25.0 | 4.0 | 23.0 | 4.0 | 33.0 | 4.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 8.7 | 2.6 | 2.3 | 13.7 | 0.0 | 3.7 | 2.9 | 8.7 |
| Green Ext Time (p_c), s | 0.6 | 0.5 | 0.0 | 6.7 | 0.0 | 0.5 | 0.0 | 9.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 15.4 |
| HCM 2010 LOS | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 560 | 210 | 190 | 400 | 360 | 120 | 50 | 710 | 150 | 80 | 1430 | 450 |
| 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 | | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 609 | 228 | 117 | 435 | 391 | 14 | 54 | 772 | 56 | 87 | 1554 | 264 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 685 | 753 | 349 | 509 | 605 | 268 | 69 | 2635 | 649 | 135 | 2091 | 649 |
| Arrive On Green | 0.20 | 0.22 | 0.22 | 0.15 | 0.17 | 0.17 | 0.04 | 0.41 | 0.41 | 0.04 | 0.41 | 0.41 |
| Sat Flow, veh/h | 3442 | 3390 | 1573 | 3442 | 3539 | 1569 | 1774 | 6408 | 1578 | 3442 | 5085 | 1578 |
| Grp Volume(v), veh/h | 609 | 228 | 117 | 435 | 391 | 14 | 54 | 772 | 56 | 87 | 1554 | 264 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1573 | 1721 | 1770 | 1569 | 1774 | 1602 | 1578 | 1721 | 1695 | 1578 |
| Q Serve(g_s), s | 21.6 | 7.0 | 7.8 | 15.4 | 12.9 | 0.9 | 3.8 | 10.1 | 2.7 | 3.1 | 32.4 | 14.8 |
| Cycle Q Clear(g_c), s | 21.6 | 7.0 | 7.8 | 15.4 | 12.9 | 0.9 | 3.8 | 10.1 | 2.7 | 3.1 | 32.4 | 14.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 685 | 753 | 349 | 509 | 605 | 268 | 69 | 2635 | 649 | 135 | 2091 | 649 |
| V/C Ratio(X) | 0.89 | 0.30 | 0.34 | 0.85 | 0.65 | 0.05 | 0.78 | 0.29 | 0.09 | 0.64 | 0.74 | 0.41 |
| Avail Cap(c_a), veh/h | 825 | 1110 | 515 | 715 | 1046 | 464 | 99 | 2635 | 649 | 220 | 2091 | 649 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.8 | 40.6 | 40.9 | 52.0 | 48.4 | 43.4 | 59.6 | 24.7 | 22.5 | 59.3 | 31.3 | 26.1 |
| Incr Delay (d2), s/veh | 10.3 | 0.2 | 0.6 | 7.2 | 1.2 | 0.1 | 21.4 | 0.3 | 0.3 | 5.0 | 2.4 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.2 | 3.3 | 3.5 | 7.9 | 6.4 | 0.4 | 2.3 | 4.5 | 1.2 | 1.6 | 15.6 | 6.8 |
| LnGrp Delay(d),s/veh | 59.1 | 40.9 | 41.5 | 59.3 | 49.6 | 43.5 | 81.0 | 25.0 | 22.8 | 64.3 | 33.7 | 28.0 |
| LnGrp LOS | E | D | D | E | D | D | F | C | C | E | C | C |
| Approach Vol, veh/h | | 954 | | | 840 | | | 882 | | | 1905 | |
| Approach Delay, s/veh | | 52.6 | | | 54.5 | | | 28.3 | | | 34.3 | |
| Approach LOS | | D | | | D | | | C | | | 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 | 9.9 | 57.2 | 24.5 | 33.6 | 9.9 | 57.2 | 30.9 | 27.2 |
| Change Period (Y+Rc), s | 5.0 | 5.7 | 6.0 | * 5.8 | 5.0 | 5.7 | 6.0 | 5.8 |
| Max Green Setting (Gmax), s | 8.0 | 50.5 | 26.0 | * 41 | 7.0 | 51.5 | 30.0 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 5.1 | 12.1 | 17.4 | 9.8 | 5.8 | 34.4 | 23.6 | 14.9 |
| Green Ext Time (p_c), s | 0.0 | 27.6 | 1.1 | 5.5 | 0.0 | 14.4 | 1.4 | 5.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 40.6 |
| HCM 2010 LOS | D |

**Notes**

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 550 | 120 | 50 | 1350 | 20 | 90 | 10 | 40 | 10 | 10 | 50 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 33 | 598 | 64 | 54 | 1467 | 11 | 106 | 0 | 1 | 11 | 11 | 1 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 39 | 2793 | 870 | 67 | 2873 | 884 | 195 | 0 | 87 | 23 | 24 | 20 |
| Arrive On Green | 0.02 | 0.55 | 0.55 | 0.04 | 0.57 | 0.57 | 0.05 | 0.00 | 0.05 | 0.01 | 0.01 | 0.01 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 33 | 598 | 64 | 54 | 1467 | 11 | 106 | 0 | 1 | 11 | 11 | 1 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 1.1 | 3.5 | 1.1 | 1.7 | 10.2 | 0.2 | 1.7 | 0.0 | 0.0 | 0.4 | 0.3 | 0.0 |
| Cycle Q Clear(g_c), s | 1.1 | 3.5 | 1.1 | 1.7 | 10.2 | 0.2 | 1.7 | 0.0 | 0.0 | 0.4 | 0.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 39 | 2793 | 870 | 67 | 2873 | 884 | 195 | 0 | 87 | 23 | 24 | 20 |
| V/C Ratio(X) | 0.85 | 0.21 | 0.07 | 0.81 | 0.51 | 0.01 | 0.54 | 0.00 | 0.01 | 0.49 | 0.46 | 0.05 |
| Avail Cap(c_a), veh/h | 77 | 2793 | 870 | 297 | 3119 | 959 | 2329 | 0 | 1039 | 1195 | 1255 | 1067 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.2 | 6.7 | 6.1 | 27.6 | 7.7 | 5.5 | 26.7 | 0.0 | 25.9 | 28.4 | 28.4 | 28.2 |
| Incr Delay (d2), s/veh | 16.9 | 0.1 | 0.1 | 8.3 | 0.6 | 0.0 | 0.9 | 0.0 | 0.0 | 5.9 | 5.1 | 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 | 0.7 | 1.6 | 0.5 | 1.0 | 4.9 | 0.1 | 0.8 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 |
| LnGrp Delay(d),s/veh | 45.1 | 6.8 | 6.3 | 36.0 | 8.3 | 5.5 | 27.5 | 0.0 | 25.9 | 34.3 | 33.5 | 28.6 |
| LnGrp LOS | D | A | A | D | A | A | C | | C | C | C | C |
| Approach Vol, veh/h | | 695 | | | 1532 | | | 107 | | | 23 | |
| Approach Delay, s/veh | | 8.6 | | | 9.3 | | | 27.5 | | | 33.7 | |
| Approach LOS | | A | | | A | | | 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 | 5.8 | 39.2 | | 5.2 | 6.7 | 38.3 | | 7.7 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 2.5 | 35.5 | | 39.0 | 9.7 | * 28 | | 38.0 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 12.2 | | 2.4 | 3.7 | 5.5 | | 3.7 |
| Green Ext Time (p_c), s | 0.0 | 20.5 | | 0.0 | 0.0 | 21.6 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.1 |
| 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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 60 | 470 | 70 | 30 | 1210 | 140 | 100 | 10 | 30 | 90 | 20 | 110 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 65 | 511 | 33 | 33 | 1315 | 63 | 109 | 11 | 1 | 98 | 22 | 9 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 100 | 2233 | 695 | 63 | 2127 | 662 | 206 | 111 | 94 | 197 | 69 | 28 |
| Arrive On Green | 0.06 | 0.44 | 0.44 | 0.04 | 0.42 | 0.42 | 0.12 | 0.06 | 0.06 | 0.11 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1258 | 514 |
| Grp Volume(v), veh/h | 65 | 511 | 33 | 33 | 1315 | 63 | 109 | 11 | 1 | 98 | 0 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1772 |
| Q Serve(g_s), s | 2.0 | 3.5 | 0.7 | 1.0 | 11.4 | 1.4 | 3.3 | 0.3 | 0.0 | 2.9 | 0.0 | 0.9 |
| Cycle Q Clear(g_c), s | 2.0 | 3.5 | 0.7 | 1.0 | 11.4 | 1.4 | 3.3 | 0.3 | 0.0 | 2.9 | 0.0 | 0.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.29 |
| Lane Grp Cap(c), veh/h | 100 | 2233 | 695 | 63 | 2127 | 662 | 206 | 111 | 94 | 197 | 0 | 97 |
| V/C Ratio(X) | 0.65 | 0.23 | 0.05 | 0.52 | 0.62 | 0.10 | 0.53 | 0.10 | 0.01 | 0.50 | 0.00 | 0.32 |
| Avail Cap(c_a), veh/h | 157 | 2233 | 695 | 189 | 2253 | 702 | 252 | 1222 | 1038 | 252 | 0 | 1162 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.1 | 9.9 | 9.1 | 26.7 | 12.9 | 9.9 | 23.5 | 25.1 | 25.0 | 23.6 | 0.0 | 25.7 |
| Incr Delay (d2), s/veh | 2.6 | 0.1 | 0.1 | 2.4 | 0.8 | 0.1 | 2.1 | 0.4 | 0.0 | 1.9 | 0.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.7 | 0.3 | 0.5 | 5.5 | 0.6 | 1.7 | 0.2 | 0.0 | 1.5 | 0.0 | 0.5 |
| LnGrp Delay(d),s/veh | 28.7 | 10.0 | 9.1 | 29.2 | 13.6 | 10.1 | 25.6 | 25.5 | 25.0 | 25.5 | 0.0 | 27.6 |
| LnGrp LOS | C | B | A | C | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 609 | | | 1411 | | | 121 | | | 129 | |
| Approach Delay, s/veh | | 12.0 | | | 13.8 | | | 25.6 | | | 26.0 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 6.5 | 31.3 | 11.1 | 7.6 | 7.7 | 30.1 | 10.8 | 7.9 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 6.0 | * 24 | 8.0 | 37.0 | 5.0 | 25.0 | 8.0 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 3.0 | 5.5 | 5.3 | 2.9 | 4.0 | 13.4 | 4.9 | 2.3 |
| Green Ext Time (p_c), s | 0.0 | 16.0 | 0.1 | 0.2 | 0.0 | 10.1 | 0.1 | 0.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 14.6 |
| HCM 2010 LOS | | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 460 | 0 | 170 | 0 | 1120 | 330 | 0 | 540 | 1100 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 500 | 0 | 162 | 0 | 1217 | 0 | 0 | 587 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 869 | 0 | 703 | 0 | 1715 | 767 | 0 | 1715 | 767 |
| Arrive On Green | | | | 0.25 | 0.00 | 0.25 | 0.00 | 0.48 | 0.00 | 0.00 | 0.48 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 3632 | 1583 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | | | | 500 | 0 | 162 | 0 | 1217 | 0 | 0 | 587 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1770 | 1583 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | | | | 3.9 | 0.0 | 1.4 | 0.0 | 8.2 | 0.0 | 0.0 | 3.1 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 3.9 | 0.0 | 1.4 | 0.0 | 8.2 | 0.0 | 0.0 | 3.1 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 869 | 0 | 703 | 0 | 1715 | 767 | 0 | 1715 | 767 |
| V/C Ratio(X) | | | | 0.58 | 0.00 | 0.23 | 0.00 | 0.71 | 0.00 | 0.00 | 0.34 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 1810 | 0 | 1466 | 0 | 1861 | 833 | 0 | 1861 | 833 |
| 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 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 9.9 | 0.0 | 9.0 | 0.0 | 6.2 | 0.0 | 0.0 | 4.8 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.6 | 0.0 | 0.2 | 0.0 | 1.2 | 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 | | | | 1.9 | 0.0 | 0.6 | 0.0 | 4.2 | 0.0 | 0.0 | 1.5 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 10.6 | 0.0 | 9.2 | 0.0 | 7.3 | 0.0 | 0.0 | 5.0 | 0.0 |
| LnGrp LOS | | | | B | | A | | A | | | A | |
| Approach Vol, veh/h | | | | | 662 | | | 1217 | | | 587 | |
| Approach Delay, s/veh | | | | | 10.2 | | | 7.3 | | | 5.0 | |
| 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 | | 18.7 | | | | 18.7 | | 11.7 |
| 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 | | 10.2 | | | | 5.1 | | 5.9 |
| Green Ext Time (p_c), s | | 4.5 | | | | 7.7 | | 1.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.5 |
| HCM 2010 LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 770 | 0 | 140 | 0 | 0 | 0 | 0 | 680 | 140 | 0 | 860 | 140 |
| 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 | 837 | 0 | 95 | | | | 0 | 739 | 0 | 0 | 935 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1165 | 0 | 943 | | | | 0 | 1491 | 667 | 0 | 1491 | 667 |
| Arrive On Green | 0.34 | 0.00 | 0.34 | | | | 0.00 | 0.42 | 0.00 | 0.00 | 0.42 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 3632 | 1583 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | 837 | 0 | 95 | | | | 0 | 739 | 0 | 0 | 935 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1770 | 1583 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | 7.1 | 0.0 | 0.8 | | | | 0.0 | 5.1 | 0.0 | 0.0 | 6.9 | 0.0 |
| Cycle Q Clear(g_c), s | 7.1 | 0.0 | 0.8 | | | | 0.0 | 5.1 | 0.0 | 0.0 | 6.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1165 | 0 | 943 | | | | 0 | 1491 | 667 | 0 | 1491 | 667 |
| V/C Ratio(X) | 0.72 | 0.00 | 0.10 | | | | 0.00 | 0.50 | 0.00 | 0.00 | 0.63 | 0.00 |
| Avail Cap(c_a), veh/h | 1654 | 0 | 1339 | | | | 0 | 1701 | 761 | 0 | 1701 | 761 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 9.6 | 0.0 | 7.5 | | | | 0.0 | 7.0 | 0.0 | 0.0 | 7.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 0.0 | | | | 0.0 | 0.3 | 0.0 | 0.0 | 0.6 | 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 |
| %ile BackOfQ(50%),veh/ln | 3.4 | 0.0 | 0.3 | | | | 0.0 | 2.5 | 0.0 | 0.0 | 3.4 | 0.0 |
| LnGrp Delay(d),s/veh | 10.5 | 0.0 | 7.6 | | | | 0.0 | 7.3 | 0.0 | 0.0 | 8.2 | 0.0 |
| LnGrp LOS | B | | A | | | | | A | | | A | |
| Approach Vol, veh/h | | 932 | | | | | | 739 | | | 935 | |
| Approach Delay, s/veh | | 10.2 | | | | | | 7.3 | | | 8.2 | |
| 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 | | 18.0 | | 15.3 | | 18.0 | | |
| 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 | | 7.1 | | 9.1 | | 8.9 | | |
| Green Ext Time (p_c), s | | 6.2 | | 2.2 | | 5.1 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 8.7 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 420 | 0 | 1070 | 0 | 530 | 390 | 0 | 1110 | 190 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 457 | 0 | 1049 | 0 | 576 | 0 | 0 | 1207 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 1594 | 0 | 1291 | 0 | 2002 | 623 | 0 | 2002 | 623 |
| Arrive On Green | | | | 0.46 | 0.00 | 0.46 | 0.00 | 0.79 | 0.00 | 0.00 | 0.39 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | | | | 457 | 0 | 1049 | 0 | 576 | 0 | 0 | 1207 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | | | | 4.6 | 0.0 | 18.1 | 0.0 | 1.7 | 0.0 | 0.0 | 10.5 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 4.6 | 0.0 | 18.1 | 0.0 | 1.7 | 0.0 | 0.0 | 10.5 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 1594 | 0 | 1291 | 0 | 2002 | 623 | 0 | 2002 | 623 |
| V/C Ratio(X) | | | | 0.29 | 0.00 | 0.81 | 0.00 | 0.29 | 0.00 | 0.00 | 0.60 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 2155 | 0 | 1745 | 0 | 2002 | 623 | 0 | 2002 | 623 |
| 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 | 0.97 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 9.3 | 0.0 | 12.9 | 0.0 | 3.8 | 0.0 | 0.0 | 13.5 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.1 | 0.0 | 2.2 | 0.0 | 0.4 | 0.0 | 0.0 | 1.4 | 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 | | | | 2.2 | 0.0 | 7.2 | 0.0 | 0.8 | 0.0 | 0.0 | 5.2 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 9.4 | 0.0 | 15.1 | 0.0 | 4.1 | 0.0 | 0.0 | 14.8 | 0.0 |
| LnGrp LOS | | | | A | | B | | A | | | B | |
| Approach Vol, veh/h | | | | | 1506 | | | 576 | | | 1207 | |
| Approach Delay, s/veh | | | | | 13.4 | | | 4.1 | | | 14.8 | |
| Approach LOS | | | | | B | | | A | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 35.1 | | | | 35.1 | | 29.9 |
| Change Period (Y+Rc), s | | 4.0 | | | | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | | 22.0 | | | | 22.0 | | 35.0 |
| Max Q Clear Time (g_c+I1), s | | 3.7 | | | | 12.5 | | 20.1 |
| Green Ext Time (p_c), s | | 11.0 | | | | 6.8 | | 5.8 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 12.3 |
| HCM 2010 LOS | | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 0 | 670 | 0 | 0 | 0 | 0 | 800 | 190 | 0 | 1150 | 380 |
| 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 | 130 | 0 | 702 | | | | 0 | 870 | 0 | 0 | 1250 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1110 | 0 | 899 | | | | 0 | 2679 | 834 | 0 | 2679 | 834 |
| Arrive On Green | 0.32 | 0.00 | 0.32 | | | | 0.00 | 0.53 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 130 | 0 | 702 | | | | 0 | 870 | 0 | 0 | 1250 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 1.4 | 0.0 | 12.1 | | | | 0.0 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 1.4 | 0.0 | 12.1 | | | | 0.0 | 5.2 | 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 | 1110 | 0 | 899 | | | | 0 | 2679 | 834 | 0 | 2679 | 834 |
| V/C Ratio(X) | 0.12 | 0.00 | 0.78 | | | | 0.00 | 0.32 | 0.00 | 0.00 | 0.47 | 0.00 |
| Avail Cap(c_a), veh/h | 1878 | 0 | 1521 | | | | 0 | 2679 | 834 | 0 | 2679 | 834 |
| 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 | 0.85 | 0.00 |
| Uniform Delay (d), s/veh | 12.7 | 0.0 | 16.3 | | | | 0.0 | 7.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 1.5 | | | | 0.0 | 0.3 | 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 | 0.7 | 0.0 | 4.8 | | | | 0.0 | 2.5 | 0.0 | 0.0 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 12.7 | 0.0 | 17.8 | | | | 0.0 | 7.5 | 0.0 | 0.0 | 0.5 | 0.0 |
| LnGrp LOS | B | | B | | | | | A | | | A | |
| Approach Vol, veh/h | | 832 | | | | | | 870 | | | 1250 | |
| Approach Delay, s/veh | | 17.0 | | | | | | 7.5 | | | 0.5 | |
| 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 | | 43.9 | | 21.1 | | 43.9 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 28.0 | | 29.0 | | 28.0 | | |
| Max Q Clear Time (g_c+I1), s | | 7.2 | | 14.1 | | 2.0 | | |
| Green Ext Time (p_c), s | | 14.0 | | 3.0 | | 16.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.2 |
| HCM 2010 LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 160 | 190 | 60 | 90 | 390 | 310 | 150 | 1010 | 90 | 330 | 1370 | 190 |
| 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 | | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 174 | 207 | 13 | 98 | 424 | 199 | 163 | 1098 | 34 | 359 | 1489 | 72 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 254 | 1248 | 386 | 163 | 1115 | 345 | 243 | 1901 | 589 | 452 | 2208 | 685 |
| Arrive On Green | 0.07 | 0.25 | 0.25 | 0.05 | 0.22 | 0.22 | 0.07 | 0.37 | 0.37 | 0.13 | 0.43 | 0.43 |
| Sat Flow, veh/h | 3442 | 5085 | 1574 | 3442 | 5085 | 1573 | 3442 | 5085 | 1577 | 3442 | 5085 | 1578 |
| Grp Volume(v), veh/h | 174 | 207 | 13 | 98 | 424 | 199 | 163 | 1098 | 34 | 359 | 1489 | 72 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1574 | 1721 | 1695 | 1573 | 1721 | 1695 | 1577 | 1721 | 1695 | 1578 |
| Q Serve(g_s), s | 3.9 | 2.5 | 0.5 | 2.2 | 5.6 | 9.0 | 3.7 | 13.7 | 1.1 | 8.0 | 18.5 | 2.1 |
| Cycle Q Clear(g_c), s | 3.9 | 2.5 | 0.5 | 2.2 | 5.6 | 9.0 | 3.7 | 13.7 | 1.1 | 8.0 | 18.5 | 2.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 254 | 1248 | 386 | 163 | 1115 | 345 | 243 | 1901 | 589 | 452 | 2208 | 685 |
| V/C Ratio(X) | 0.69 | 0.17 | 0.03 | 0.60 | 0.38 | 0.58 | 0.67 | 0.58 | 0.06 | 0.79 | 0.67 | 0.11 |
| Avail Cap(c_a), veh/h | 304 | 2120 | 656 | 261 | 2056 | 636 | 348 | 2056 | 637 | 565 | 2377 | 737 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.8 | 23.5 | 22.7 | 37.0 | 26.3 | 27.6 | 35.9 | 19.8 | 15.9 | 33.4 | 17.9 | 13.3 |
| Incr Delay (d2), s/veh | 4.9 | 0.1 | 0.0 | 3.5 | 0.2 | 1.5 | 3.2 | 0.3 | 0.0 | 6.2 | 0.7 | 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 | 2.0 | 1.2 | 0.2 | 1.1 | 2.7 | 4.0 | 1.9 | 6.4 | 0.5 | 4.2 | 8.7 | 0.9 |
| LnGrp Delay(d),s/veh | 40.7 | 23.6 | 22.8 | 40.5 | 26.5 | 29.2 | 39.0 | 20.1 | 15.9 | 39.6 | 18.6 | 13.3 |
| LnGrp LOS | D | C | C | D | C | C | D | C | B | D | B | B |
| Approach Vol, veh/h | | 394 | | | 721 | | | 1295 | | | 1920 | |
| Approach Delay, s/veh | | 31.1 | | | 29.2 | | | 22.4 | | | 22.3 | |
| Approach LOS | | C | | | C | | | C | | | 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 | 14.4 | 33.6 | 7.8 | 23.4 | 9.6 | 38.4 | 9.8 | 21.4 |
| 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 | 13.0 | 32.0 | 6.0 | 33.0 | 8.0 | 37.0 | 7.0 | 32.0 |
| Max Q Clear Time (g_c+I1), s | 10.0 | 15.7 | 4.2 | 4.5 | 5.7 | 20.5 | 5.9 | 11.0 |
| Green Ext Time (p_c), s | 0.4 | 13.6 | 0.0 | 5.0 | 0.1 | 13.7 | 0.1 | 4.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 24.3 |
| HCM 2010 LOS | | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 70 | 350 | 190 | 20 | 440 | 200 | 280 | 340 | 20 | 50 | 170 | 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 76 | 380 | 60 | 22 | 478 | 57 | 304 | 370 | 7 | 54 | 185 | 13 |
| Adj No. of Lanes | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 153 | 661 | 560 | 35 | 616 | 521 | 361 | 663 | 560 | 68 | 356 | 300 |
| Arrive On Green | 0.04 | 0.36 | 0.36 | 0.02 | 0.33 | 0.33 | 0.20 | 0.36 | 0.36 | 0.04 | 0.19 | 0.19 |
| Sat Flow, veh/h | 3442 | 1863 | 1577 | 1774 | 1863 | 1576 | 1774 | 1863 | 1572 | 1774 | 1863 | 1571 |
| Grp Volume(v), veh/h | 76 | 380 | 60 | 22 | 478 | 57 | 304 | 370 | 7 | 54 | 185 | 13 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1577 | 1774 | 1863 | 1576 | 1774 | 1863 | 1572 | 1774 | 1863 | 1571 |
| Q Serve(g_s), s | 1.5 | 11.5 | 1.8 | 0.9 | 16.0 | 1.7 | 11.4 | 11.1 | 0.2 | 2.1 | 6.2 | 0.5 |
| Cycle Q Clear(g_c), s | 1.5 | 11.5 | 1.8 | 0.9 | 16.0 | 1.7 | 11.4 | 11.1 | 0.2 | 2.1 | 6.2 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 153 | 661 | 560 | 35 | 616 | 521 | 361 | 663 | 560 | 68 | 356 | 300 |
| V/C Ratio(X) | 0.50 | 0.57 | 0.11 | 0.62 | 0.78 | 0.11 | 0.84 | 0.56 | 0.01 | 0.79 | 0.52 | 0.04 |
| Avail Cap(c_a), veh/h | 198 | 912 | 772 | 128 | 939 | 795 | 639 | 1261 | 1064 | 204 | 805 | 679 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.4 | 18.1 | 15.0 | 33.8 | 20.9 | 16.1 | 26.6 | 18.0 | 14.5 | 33.1 | 25.2 | 22.9 |
| Incr Delay (d2), s/veh | 2.5 | 0.8 | 0.1 | 16.5 | 2.3 | 0.1 | 5.4 | 0.7 | 0.0 | 18.2 | 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 | 0.8 | 6.1 | 0.8 | 0.6 | 8.6 | 0.8 | 6.1 | 5.8 | 0.1 | 1.4 | 3.3 | 0.2 |
| LnGrp Delay(d),s/veh | 34.9 | 18.9 | 15.1 | 50.3 | 23.2 | 16.2 | 32.0 | 18.7 | 14.5 | 51.3 | 26.4 | 23.0 |
| LnGrp LOS | C | B | B | D | C | B | C | B | B | D | C | C |
| Approach Vol, veh/h | | 516 | | | 557 | | | 681 | | | 252 | |
| Approach Delay, s/veh | | 20.8 | | | 23.6 | | | 24.6 | | | 31.5 | |
| Approach LOS | | C | | | C | | | C | | | 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 | 6.7 | 28.7 | 5.4 | 28.7 | 18.1 | 17.3 | 7.1 | 27.0 |
| 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 | 8.0 | 47.0 | 5.0 | 34.0 | 25.0 | 30.0 | 4.0 | 35.0 |
| Max Q Clear Time (g_c+I1), s | 4.1 | 13.1 | 2.9 | 13.5 | 13.4 | 8.2 | 3.5 | 18.0 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.0 | 5.3 | 0.7 | 3.5 | 0.0 | 4.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 24.2 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 30 | 60 | 50 | 60 | 10 | 110 | 760 | 50 | 10 | 1150 | 320 |
| 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 | | 0.97 | 1.00 | | 0.97 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 76 | 94 | 3 | 54 | 65 | 2 | 120 | 826 | 49 | 11 | 1250 | 131 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 202 | 212 | 176 | 180 | 182 | 6 | 153 | 2260 | 134 | 20 | 1960 | 602 |
| Arrive On Green | 0.11 | 0.11 | 0.11 | 0.10 | 0.10 | 0.10 | 0.09 | 0.46 | 0.46 | 0.01 | 0.39 | 0.39 |
| Sat Flow, veh/h | 1774 | 1863 | 1542 | 1774 | 1796 | 55 | 1774 | 4908 | 290 | 1774 | 5085 | 1563 |
| Grp Volume(v), veh/h | 76 | 94 | 3 | 54 | 0 | 67 | 120 | 570 | 305 | 11 | 1250 | 131 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1542 | 1774 | 0 | 1851 | 1774 | 1695 | 1808 | 1774 | 1695 | 1563 |
| Q Serve(g_s), s | 2.0 | 2.4 | 0.1 | 1.4 | 0.0 | 1.7 | 3.4 | 5.6 | 5.6 | 0.3 | 10.2 | 2.9 |
| Cycle Q Clear(g_c), s | 2.0 | 2.4 | 0.1 | 1.4 | 0.0 | 1.7 | 3.4 | 5.6 | 5.6 | 0.3 | 10.2 | 2.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.03 | 1.00 | | 0.16 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 202 | 212 | 176 | 180 | 0 | 188 | 153 | 1561 | 832 | 20 | 1960 | 602 |
| V/C Ratio(X) | 0.38 | 0.44 | 0.02 | 0.30 | 0.00 | 0.36 | 0.78 | 0.36 | 0.37 | 0.55 | 0.64 | 0.22 |
| Avail Cap(c_a), veh/h | 798 | 838 | 694 | 1006 | 0 | 1050 | 173 | 1561 | 832 | 139 | 2188 | 672 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.0 | 21.1 | 20.1 | 21.3 | 0.0 | 21.4 | 22.9 | 8.9 | 9.0 | 25.1 | 12.8 | 10.5 |
| Incr Delay (d2), s/veh | 1.2 | 1.4 | 0.0 | 0.9 | 0.0 | 1.1 | 18.6 | 0.1 | 0.3 | 21.3 | 0.5 | 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 | 1.1 | 1.3 | 0.0 | 0.8 | 0.0 | 0.9 | 2.5 | 2.6 | 2.9 | 0.3 | 4.8 | 1.3 |
| LnGrp Delay(d),s/veh | 22.1 | 22.6 | 20.1 | 22.2 | 0.0 | 22.6 | 41.5 | 9.1 | 9.2 | 46.4 | 13.3 | 10.7 |
| LnGrp LOS | C | C | C | C | | C | D | A | A | D | B | B |
| Approach Vol, veh/h | | 173 | | | 121 | | | 995 | | | 1392 | |
| Approach Delay, s/veh | | 22.3 | | | 22.4 | | | 13.0 | | | 13.3 | |
| Approach LOS | | C | | | C | | | 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 | 4.6 | 27.5 | | 9.8 | 8.4 | 23.7 | | 9.2 |
| Change Period (Y+Rc), s | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | 4.0 | 23.0 | | 23.0 | 5.0 | 22.0 | | 29.0 |
| Max Q Clear Time (g_c+I1), s | 2.3 | 7.6 | | 4.4 | 5.4 | 12.2 | | 3.7 |
| Green Ext Time (p_c), s | 0.0 | 11.4 | | 0.6 | 0.0 | 7.5 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.2 |
| HCM 2010 LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 50 | 20 | 10 | 10 | 30 | 60 | 10 | 1140 | 20 | 190 | 1180 | 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 | | 0.99 | 1.00 | | 0.98 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 54 | 22 | 1 | 11 | 33 | 5 | 11 | 1239 | 8 | 207 | 1283 | 84 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 75 | 209 | 9 | 20 | 137 | 21 | 20 | 2037 | 632 | 260 | 2726 | 845 |
| Arrive On Green | 0.04 | 0.12 | 0.12 | 0.01 | 0.09 | 0.09 | 0.01 | 0.40 | 0.40 | 0.15 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1774 | 1767 | 80 | 1774 | 1577 | 239 | 1774 | 5085 | 1577 | 1774 | 5085 | 1576 |
| Grp Volume(v), veh/h | 54 | 0 | 23 | 11 | 0 | 38 | 11 | 1239 | 8 | 207 | 1283 | 84 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1847 | 1774 | 0 | 1816 | 1774 | 1695 | 1577 | 1774 | 1695 | 1576 |
| Q Serve(g_s), s | 1.5 | 0.0 | 0.6 | 0.3 | 0.0 | 1.0 | 0.3 | 9.6 | 0.2 | 5.6 | 7.7 | 1.3 |
| Cycle Q Clear(g_c), s | 1.5 | 0.0 | 0.6 | 0.3 | 0.0 | 1.0 | 0.3 | 9.6 | 0.2 | 5.6 | 7.7 | 1.3 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.13 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 75 | 0 | 218 | 20 | 0 | 158 | 20 | 2037 | 632 | 260 | 2726 | 845 |
| V/C Ratio(X) | 0.72 | 0.00 | 0.11 | 0.55 | 0.00 | 0.24 | 0.55 | 0.61 | 0.01 | 0.80 | 0.47 | 0.10 |
| Avail Cap(c_a), veh/h | 143 | 0 | 1083 | 143 | 0 | 1064 | 143 | 2158 | 669 | 358 | 2775 | 860 |
| 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 | 23.4 | 0.0 | 19.5 | 24.3 | 0.0 | 21.1 | 24.3 | 11.8 | 8.9 | 20.4 | 7.1 | 5.6 |
| Incr Delay (d2), s/veh | 12.1 | 0.0 | 0.2 | 21.1 | 0.0 | 0.8 | 21.1 | 0.5 | 0.0 | 8.3 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 0.3 | 0.3 | 0.0 | 0.5 | 0.3 | 4.4 | 0.1 | 3.3 | 3.6 | 0.6 |
| LnGrp Delay(d),s/veh | 35.5 | 0.0 | 19.7 | 45.5 | 0.0 | 21.8 | 45.5 | 12.2 | 8.9 | 28.7 | 7.3 | 5.7 |
| LnGrp LOS | D | | B | D | | C | D | B | A | C | A | A |
| Approach Vol, veh/h | | 77 | | | 49 | | | 1258 | | | 1574 | |
| Approach Delay, s/veh | | 30.8 | | | 27.1 | | | 12.5 | | | 10.0 | |
| Approach LOS | | C | | | C | | | B | | | A | |

| 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 | 11.3 | 23.8 | 4.6 | 9.8 | 4.6 | 30.5 | 6.1 | 8.3 |
| 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 | 10.0 | 21.0 | 4.0 | 29.0 | 4.0 | 27.0 | 4.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 7.6 | 11.6 | 2.3 | 2.6 | 2.3 | 9.7 | 3.5 | 3.0 |
| Green Ext Time (p_c), s | 0.1 | 8.3 | 0.0 | 0.2 | 0.0 | 14.0 | 0.0 | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 180 | 30 | 10 | 60 | 610 | 10 | 10 | 10 | 310 | 40 | 30 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 22 | 196 | 23 | 11 | 65 | 116 | 11 | 11 | 0 | 337 | 43 | 10 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 39 | 344 | 40 | 21 | 372 | 312 | 21 | 148 | 0 | 432 | 455 | 106 |
| Arrive On Green | 0.02 | 0.21 | 0.21 | 0.01 | 0.20 | 0.20 | 0.01 | 0.08 | 0.00 | 0.24 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1774 | 1634 | 192 | 1774 | 1863 | 1564 | 1774 | 1863 | 0 | 1774 | 1460 | 340 |
| Grp Volume(v), veh/h | 22 | 0 | 219 | 11 | 65 | 116 | 11 | 11 | 0 | 337 | 0 | 53 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1826 | 1774 | 1863 | 1564 | 1774 | 1863 | 0 | 1774 | 0 | 1800 |
| Q Serve(g_s), s | 0.4 | 0.0 | 3.8 | 0.2 | 1.0 | 2.3 | 0.2 | 0.2 | 0.0 | 6.2 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | 0.4 | 0.0 | 3.8 | 0.2 | 1.0 | 2.3 | 0.2 | 0.2 | 0.0 | 6.2 | 0.0 | 0.7 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 39 | 0 | 384 | 21 | 372 | 312 | 21 | 148 | 0 | 432 | 0 | 561 |
| V/C Ratio(X) | 0.56 | 0.00 | 0.57 | 0.54 | 0.17 | 0.37 | 0.54 | 0.07 | 0.00 | 0.78 | 0.00 | 0.09 |
| Avail Cap(c_a), veh/h | 202 | 0 | 883 | 202 | 900 | 756 | 202 | 900 | 0 | 807 | 0 | 1484 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.0 | 0.0 | 12.5 | 17.3 | 11.7 | 12.2 | 17.3 | 15.0 | 0.0 | 12.4 | 0.0 | 8.6 |
| Incr Delay (d2), s/veh | 12.1 | 0.0 | 1.3 | 19.9 | 0.2 | 0.7 | 19.9 | 0.2 | 0.0 | 3.1 | 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 | 0.3 | 0.0 | 2.0 | 0.2 | 0.5 | 1.0 | 0.2 | 0.1 | 0.0 | 3.4 | 0.0 | 0.4 |
| LnGrp Delay(d),s/veh | 29.2 | 0.0 | 13.8 | 37.2 | 11.9 | 12.9 | 37.2 | 15.2 | 0.0 | 15.5 | 0.0 | 8.7 |
| LnGrp LOS | C | | B | D | B | B | D | B | | B | | A |
| Approach Vol, veh/h | | 241 | | | 192 | | | 22 | | | 390 | |
| Approach Delay, s/veh | | 15.2 | | | 13.9 | | | 26.2 | | | 14.6 | |
| Approach LOS | | B | | | B | | | 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 | 12.6 | 6.8 | 4.4 | 11.4 | 4.4 | 15.0 | 4.8 | 11.0 |
| 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 | 16.0 | 17.0 | 4.0 | 17.0 | 4.0 | 29.0 | 4.0 | 17.0 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 2.2 | 2.2 | 5.8 | 2.2 | 2.7 | 2.4 | 4.3 |
| Green Ext Time (p_c), s | 0.7 | 0.2 | 0.0 | 1.4 | 0.0 | 0.3 | 0.0 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 160 | 50 | 20 | 60 | 70 | 110 | 10 | 750 | 30 | 40 | 470 | 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 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 174 | 54 | 5 | 65 | 76 | 11 | 11 | 815 | 9 | 43 | 511 | 32 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 222 | 355 | 299 | 89 | 214 | 180 | 20 | 1261 | 560 | 66 | 1352 | 601 |
| Arrive On Green | 0.13 | 0.19 | 0.19 | 0.05 | 0.12 | 0.12 | 0.01 | 0.36 | 0.36 | 0.04 | 0.38 | 0.38 |
| Sat Flow, veh/h | 1774 | 1863 | 1571 | 1774 | 1863 | 1563 | 1774 | 3539 | 1572 | 1774 | 3539 | 1573 |
| Grp Volume(v), veh/h | 174 | 54 | 5 | 65 | 76 | 11 | 11 | 815 | 9 | 43 | 511 | 32 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1571 | 1774 | 1863 | 1563 | 1774 | 1770 | 1572 | 1774 | 1770 | 1573 |
| Q Serve(g_s), s | 4.2 | 1.1 | 0.1 | 1.6 | 1.6 | 0.3 | 0.3 | 8.4 | 0.2 | 1.0 | 4.6 | 0.6 |
| Cycle Q Clear(g_c), s | 4.2 | 1.1 | 0.1 | 1.6 | 1.6 | 0.3 | 0.3 | 8.4 | 0.2 | 1.0 | 4.6 | 0.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 222 | 355 | 299 | 89 | 214 | 180 | 20 | 1261 | 560 | 66 | 1352 | 601 |
| V/C Ratio(X) | 0.78 | 0.15 | 0.02 | 0.73 | 0.35 | 0.06 | 0.54 | 0.65 | 0.02 | 0.65 | 0.38 | 0.05 |
| Avail Cap(c_a), veh/h | 325 | 1066 | 899 | 244 | 980 | 822 | 162 | 1539 | 684 | 162 | 1539 | 684 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.5 | 14.7 | 14.4 | 20.5 | 17.8 | 17.2 | 21.5 | 11.8 | 9.1 | 20.8 | 9.8 | 8.5 |
| Incr Delay (d2), s/veh | 7.4 | 0.2 | 0.0 | 11.1 | 1.0 | 0.1 | 20.6 | 0.7 | 0.0 | 10.3 | 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 | 2.5 | 0.6 | 0.1 | 1.0 | 0.9 | 0.1 | 0.2 | 4.2 | 0.1 | 0.7 | 2.2 | 0.2 |
| LnGrp Delay(d),s/veh | 25.9 | 14.9 | 14.4 | 31.5 | 18.8 | 17.4 | 42.1 | 12.4 | 9.1 | 31.1 | 9.9 | 8.6 |
| LnGrp LOS | C | B | B | C | B | B | D | B | A | C | A | A |
| Approach Vol, veh/h | | 233 | | | 152 | | | 835 | | | 586 | |
| Approach Delay, s/veh | | 23.1 | | | 24.2 | | | 12.8 | | | 11.4 | |
| 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 | 5.6 | 19.6 | 6.2 | 12.3 | 4.5 | 20.7 | 9.5 | 9.0 |
| 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 | 4.0 | 19.0 | 6.0 | 25.0 | 4.0 | 19.0 | 8.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 3.0 | 10.4 | 3.6 | 3.1 | 2.3 | 6.6 | 6.2 | 3.6 |
| Green Ext Time (p_c), s | 0.0 | 5.1 | 0.0 | 0.6 | 0.0 | 6.6 | 0.1 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.6 |
| HCM 2010 LOS | B |

# HCM 2010 Signalized Intersection Summary
## 30: Street "A" & Street "B"

10/27/2014

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 50 | 60 | 90 | 70 | 110 | 110 | 90 | 410 | 30 | 50 | 430 | 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 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 54 | 65 | 12 | 76 | 120 | 46 | 98 | 446 | 26 | 54 | 467 | 17 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 79 | 235 | 43 | 99 | 211 | 81 | 124 | 641 | 37 | 79 | 611 | 22 |
| Arrive On Green | 0.04 | 0.15 | 0.15 | 0.06 | 0.17 | 0.17 | 0.07 | 0.37 | 0.37 | 0.04 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1774 | 1526 | 282 | 1774 | 1278 | 490 | 1774 | 1742 | 102 | 1774 | 1786 | 65 |
| Grp Volume(v), veh/h | 54 | 0 | 77 | 76 | 0 | 166 | 98 | 0 | 472 | 54 | 0 | 484 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1808 | 1774 | 0 | 1767 | 1774 | 0 | 1844 | 1774 | 0 | 1851 |
| Q Serve(g_s), s | 1.3 | 0.0 | 1.6 | 1.8 | 0.0 | 3.7 | 2.3 | 0.0 | 9.2 | 1.3 | 0.0 | 9.9 |
| Cycle Q Clear(g_c), s | 1.3 | 0.0 | 1.6 | 1.8 | 0.0 | 3.7 | 2.3 | 0.0 | 9.2 | 1.3 | 0.0 | 9.9 |
| Prop In Lane | 1.00 | | 0.16 | 1.00 | | 0.28 | 1.00 | | 0.06 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 79 | 0 | 278 | 99 | 0 | 292 | 124 | 0 | 678 | 79 | 0 | 633 |
| V/C Ratio(X) | 0.69 | 0.00 | 0.28 | 0.77 | 0.00 | 0.57 | 0.79 | 0.00 | 0.70 | 0.69 | 0.00 | 0.76 |
| Avail Cap(c_a), veh/h | 168 | 0 | 726 | 168 | 0 | 710 | 252 | 0 | 828 | 168 | 0 | 743 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.9 | 0.0 | 15.8 | 19.7 | 0.0 | 16.3 | 19.4 | 0.0 | 11.4 | 19.9 | 0.0 | 12.4 |
| Incr Delay (d2), s/veh | 10.0 | 0.0 | 0.5 | 11.6 | 0.0 | 1.7 | 10.6 | 0.0 | 2.0 | 10.0 | 0.0 | 4.0 |
| 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 | 0.8 | 0.0 | 0.8 | 1.2 | 0.0 | 1.9 | 1.5 | 0.0 | 5.0 | 0.8 | 0.0 | 5.7 |
| LnGrp Delay(d),s/veh | 30.0 | 0.0 | 16.4 | 31.4 | 0.0 | 18.0 | 29.9 | 0.0 | 13.3 | 30.0 | 0.0 | 16.4 |
| LnGrp LOS | C | | B | C | | B | C | | B | C | | B |
| Approach Vol, veh/h | | 131 | | | 242 | | | 570 | | | 538 | |
| Approach Delay, s/veh | | 22.0 | | | 22.2 | | | 16.2 | | | 17.8 | |
| 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 | 5.9 | 19.6 | 6.4 | 10.5 | 7.0 | 18.5 | 5.9 | 11.0 |
| 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 | 4.0 | 19.0 | 4.0 | 17.0 | 6.0 | 17.0 | 4.0 | 17.0 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 11.2 | 3.8 | 3.6 | 4.3 | 11.9 | 3.3 | 5.7 |
| Green Ext Time (p_c), s | 0.0 | 3.3 | 0.0 | 1.0 | 0.0 | 2.5 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 10 | 50 | 10 | 10 | 40 | 20 | 760 | 10 | 20 | 1060 | 180 |
| 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 | | 0.98 | 1.00 | | 0.97 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 130 | 11 | 8 | 11 | 11 | 2 | 22 | 826 | 10 | 22 | 1152 | 181 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 166 | 172 | 125 | 20 | 138 | 25 | 37 | 1793 | 22 | 37 | 1534 | 240 |
| Arrive On Green | 0.09 | 0.17 | 0.17 | 0.01 | 0.09 | 0.09 | 0.02 | 0.50 | 0.50 | 0.02 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1774 | 996 | 724 | 1774 | 1525 | 277 | 1774 | 3581 | 43 | 1774 | 3063 | 479 |
| Grp Volume(v), veh/h | 130 | 0 | 19 | 11 | 0 | 13 | 22 | 408 | 428 | 22 | 664 | 669 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1720 | 1774 | 0 | 1803 | 1774 | 1770 | 1855 | 1774 | 1770 | 1772 |
| Q Serve(g_s), s | 3.9 | 0.0 | 0.5 | 0.3 | 0.0 | 0.4 | 0.7 | 8.1 | 8.1 | 0.7 | 16.3 | 16.5 |
| Cycle Q Clear(g_c), s | 3.9 | 0.0 | 0.5 | 0.3 | 0.0 | 0.4 | 0.7 | 8.1 | 8.1 | 0.7 | 16.3 | 16.5 |
| Prop In Lane | 1.00 | | 0.42 | 1.00 | | 0.15 | 1.00 | | 0.02 | 1.00 | | 0.27 |
| Lane Grp Cap(c), veh/h | 166 | 0 | 297 | 20 | 0 | 163 | 37 | 886 | 929 | 37 | 886 | 888 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.06 | 0.55 | 0.00 | 0.08 | 0.60 | 0.46 | 0.46 | 0.60 | 0.75 | 0.75 |
| Avail Cap(c_a), veh/h | 228 | 0 | 822 | 130 | 0 | 762 | 130 | 976 | 1023 | 130 | 976 | 978 |
| 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 | 24.1 | 0.0 | 18.8 | 26.7 | 0.0 | 22.7 | 26.4 | 8.8 | 8.8 | 26.4 | 10.8 | 10.9 |
| Incr Delay (d2), s/veh | 11.3 | 0.0 | 0.1 | 21.6 | 0.0 | 0.2 | 14.4 | 0.4 | 0.4 | 14.4 | 2.9 | 3.1 |
| 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 | 2.4 | 0.0 | 0.2 | 0.3 | 0.0 | 0.2 | 0.5 | 4.1 | 4.3 | 0.5 | 8.5 | 8.7 |
| LnGrp Delay(d),s/veh | 35.4 | 0.0 | 18.9 | 48.3 | 0.0 | 22.9 | 40.8 | 9.2 | 9.2 | 40.8 | 13.8 | 13.9 |
| LnGrp LOS | D | | B | D | | C | D | A | A | D | B | B |
| Approach Vol, veh/h | | 149 | | | 24 | | | 858 | | | 1355 | |
| Approach Delay, s/veh | | 33.3 | | | 34.5 | | | 10.0 | | | 14.3 | |
| Approach LOS | | C | | | C | | | A | | | 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 | 5.1 | 31.2 | 4.6 | 13.4 | 5.1 | 31.2 | 9.1 | 8.9 |
| 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 | 30.0 | 4.0 | 26.0 | 4.0 | 30.0 | 7.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 2.7 | 10.1 | 2.3 | 2.5 | 2.7 | 18.5 | 5.9 | 2.4 |
| Green Ext Time (p_c), s | 0.0 | 13.3 | 0.0 | 0.1 | 0.0 | 8.8 | 0.0 | 0.1 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 14.1 |
| HCM 2010 LOS | | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 1060 | 330 | 40 | 890 | 320 | 420 | 460 | 50 | 520 | 580 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 1152 | 120 | 42 | 967 | 119 | 438 | 479 | 42 | 565 | 604 | 19 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 3 | 1 | 2 | 2 | 0 | 2 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.96 | 0.96 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.92 | 0.96 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 19 | 1249 | 558 | 54 | 1894 | 589 | 528 | 759 | 66 | 639 | 921 | 29 |
| Arrive On Green | 0.01 | 0.35 | 0.35 | 0.03 | 0.37 | 0.37 | 0.15 | 0.23 | 0.23 | 0.19 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1774 | 3539 | 1581 | 1774 | 5085 | 1581 | 3442 | 3293 | 288 | 3442 | 3503 | 110 |
| Grp Volume(v), veh/h | 11 | 1152 | 120 | 42 | 967 | 119 | 438 | 257 | 264 | 565 | 305 | 318 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1581 | 1774 | 1695 | 1581 | 1721 | 1770 | 1811 | 1721 | 1770 | 1843 |
| Q Serve(g_s), s | 0.5 | 24.9 | 4.2 | 1.9 | 11.8 | 4.1 | 9.9 | 10.4 | 10.5 | 12.8 | 12.3 | 12.3 |
| Cycle Q Clear(g_c), s | 0.5 | 24.9 | 4.2 | 1.9 | 11.8 | 4.1 | 9.9 | 10.4 | 10.5 | 12.8 | 12.3 | 12.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 19 | 1249 | 558 | 54 | 1894 | 589 | 528 | 408 | 418 | 639 | 465 | 485 |
| V/C Ratio(X) | 0.57 | 0.92 | 0.22 | 0.78 | 0.51 | 0.20 | 0.83 | 0.63 | 0.63 | 0.88 | 0.66 | 0.66 |
| Avail Cap(c_a), veh/h | 89 | 1285 | 574 | 89 | 1894 | 589 | 603 | 576 | 590 | 646 | 598 | 623 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.3 | 24.8 | 18.1 | 38.5 | 19.4 | 17.0 | 32.8 | 27.7 | 27.7 | 31.7 | 26.2 | 26.2 |
| Incr Delay (d2), s/veh | 24.0 | 10.9 | 0.2 | 21.1 | 0.2 | 0.2 | 8.5 | 1.6 | 1.6 | 13.6 | 1.7 | 1.6 |
| 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 | 0.4 | 14.1 | 1.9 | 1.2 | 5.5 | 1.8 | 5.3 | 5.2 | 5.4 | 7.3 | 6.1 | 6.4 |
| LnGrp Delay(d),s/veh | 63.3 | 35.7 | 18.3 | 59.5 | 19.6 | 17.2 | 41.3 | 29.3 | 29.3 | 45.3 | 27.9 | 27.8 |
| LnGrp LOS | E | D | B | E | B | B | D | C | C | D | C | C |
| Approach Vol, veh/h | | 1283 | | | 1128 | | | 959 | | | 1188 | |
| Approach Delay, s/veh | | 34.3 | | | 20.9 | | | 34.8 | | | 36.2 | |
| Approach LOS | | C | | | C | | | 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 | 18.8 | 22.4 | 6.4 | 32.2 | 16.2 | 25.0 | 4.9 | 33.7 |
| 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 | 15.0 | 26.0 | 4.0 | 29.0 | 14.0 | 27.0 | 4.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 14.8 | 12.5 | 3.9 | 26.9 | 11.9 | 14.3 | 2.5 | 13.8 |
| Green Ext Time (p_c), s | 0.1 | 5.6 | 0.0 | 1.3 | 0.4 | 5.4 | 0.0 | 11.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 31.6 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 410 | 140 | 350 | 220 | 350 | 140 | 2000 | 420 | 380 | 1930 | 70 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 115 | 427 | 0 | 365 | 229 | 0 | 146 | 2083 | 0 | 396 | 2010 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 166 | 730 | 227 | 414 | 1097 | 341 | 197 | 2298 | 716 | 425 | 2668 | 831 |
| Arrive On Green | 0.05 | 0.14 | 0.00 | 0.12 | 0.22 | 0.00 | 0.06 | 0.45 | 0.00 | 0.12 | 0.52 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 115 | 427 | 0 | 365 | 229 | 0 | 146 | 2083 | 0 | 396 | 2010 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 4.2 | 10.0 | 0.0 | 13.3 | 4.7 | 0.0 | 5.3 | 48.3 | 0.0 | 14.5 | 39.5 | 0.0 |
| Cycle Q Clear(g_c), s | 4.2 | 10.0 | 0.0 | 13.3 | 4.7 | 0.0 | 5.3 | 48.3 | 0.0 | 14.5 | 39.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 166 | 730 | 227 | 414 | 1097 | 341 | 197 | 2298 | 716 | 425 | 2668 | 831 |
| V/C Ratio(X) | 0.69 | 0.59 | 0.00 | 0.88 | 0.21 | 0.00 | 0.74 | 0.91 | 0.00 | 0.93 | 0.75 | 0.00 |
| Avail Cap(c_a), veh/h | 244 | 1241 | 386 | 420 | 1502 | 468 | 230 | 2298 | 716 | 425 | 2668 | 831 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 59.5 | 50.9 | 0.0 | 55.0 | 40.9 | 0.0 | 58.9 | 32.3 | 0.0 | 55.1 | 23.7 | 0.0 |
| Incr Delay (d2), s/veh | 2.0 | 1.3 | 0.0 | 18.3 | 0.2 | 0.0 | 8.0 | 6.6 | 0.0 | 26.7 | 2.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 4.8 | 0.0 | 7.3 | 2.2 | 0.0 | 2.8 | 24.0 | 0.0 | 8.5 | 18.9 | 0.0 |
| LnGrp Delay(d),s/veh | 61.5 | 52.1 | 0.0 | 73.3 | 41.1 | 0.0 | 66.9 | 38.9 | 0.0 | 81.8 | 25.8 | 0.0 |
| LnGrp LOS | E | D | | E | D | | E | D | | F | C | |
| Approach Vol, veh/h | | 542 | | | 594 | | | 2229 | | | 2406 | |
| Approach Delay, s/veh | | 54.1 | | | 60.8 | | | 40.7 | | | 35.0 | |
| Approach LOS | | D | | | 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 | 34.0 | 62.7 | 10.6 | 32.7 | 11.8 | 84.9 | 19.8 | 23.5 |
| Change Period (Y+Rc), s | 5.3 | * 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 15.7 | * 57 | 9.0 | 37.5 | 8.5 | 65.4 | 15.5 | 31.0 |
| Max Q Clear Time (g_c+I1), s | 16.5 | 50.3 | 6.2 | 6.7 | 7.3 | 41.5 | 15.3 | 12.0 |
| Green Ext Time (p_c), s | 0.0 | 7.0 | 0.0 | 7.3 | 0.0 | 22.5 | 0.0 | 6.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 41.6 |
| HCM 2010 LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 30 | 150 | 10 | 20 | 20 | 100 | 1050 | 60 | 20 | 780 | 130 |
| 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 | 1863 | 1863 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 130 | 33 | 38 | 11 | 22 | 2 | 109 | 1141 | 57 | 22 | 848 | 109 |
| Adj No. of Lanes | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 258 | 465 | 394 | 0 | 131 | 12 | 139 | 2173 | 109 | 38 | 1740 | 223 |
| Arrive On Green | 0.08 | 0.25 | 0.25 | 0.00 | 0.08 | 0.08 | 0.08 | 0.44 | 0.44 | 0.02 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3442 | 1863 | 1580 | 0 | 1682 | 153 | 1774 | 4961 | 248 | 1774 | 4564 | 584 |
| Grp Volume(v), veh/h | 130 | 33 | 38 | 0 | 0 | 24 | 109 | 780 | 418 | 22 | 629 | 328 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1580 | 0 | 0 | 1835 | 1774 | 1695 | 1818 | 1774 | 1695 | 1758 |
| Q Serve(g_s), s | 1.5 | 0.6 | 0.8 | 0.0 | 0.0 | 0.5 | 2.5 | 6.9 | 6.9 | 0.5 | 5.8 | 5.9 |
| Cycle Q Clear(g_c), s | 1.5 | 0.6 | 0.8 | 0.0 | 0.0 | 0.5 | 2.5 | 6.9 | 6.9 | 0.5 | 5.8 | 5.9 |
| Prop In Lane | 1.00 | | 1.00 | 0.00 | | 0.08 | 1.00 | | 0.14 | 1.00 | | 0.33 |
| Lane Grp Cap(c), veh/h | 258 | 465 | 394 | 0 | 0 | 143 | 139 | 1485 | 797 | 38 | 1292 | 670 |
| V/C Ratio(X) | 0.50 | 0.07 | 0.10 | 0.00 | 0.00 | 0.17 | 0.78 | 0.52 | 0.53 | 0.57 | 0.49 | 0.49 |
| Avail Cap(c_a), veh/h | 333 | 902 | 765 | 0 | 0 | 889 | 301 | 1724 | 925 | 172 | 1478 | 766 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.4 | 11.8 | 11.9 | 0.0 | 0.0 | 17.8 | 18.7 | 8.5 | 8.5 | 20.0 | 9.7 | 9.7 |
| Incr Delay (d2), s/veh | 1.5 | 0.1 | 0.1 | 0.0 | 0.0 | 0.6 | 9.2 | 0.3 | 0.5 | 12.8 | 0.3 | 0.6 |
| 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 | 0.8 | 0.3 | 0.3 | 0.0 | 0.0 | 0.3 | 1.6 | 3.2 | 3.5 | 0.4 | 2.8 | 2.9 |
| LnGrp Delay(d),s/veh | 19.9 | 11.9 | 12.0 | 0.0 | 0.0 | 18.3 | 27.9 | 8.8 | 9.0 | 32.8 | 10.0 | 10.3 |
| LnGrp LOS | B | B | B | | | B | C | A | A | C | A | B |
| Approach Vol, veh/h | | 201 | | | 24 | | | 1307 | | | 979 | |
| Approach Delay, s/veh | | 17.1 | | | 18.3 | | | 10.4 | | | 10.6 | |
| Approach LOS | | B | | | B | | | 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 | 4.9 | 22.1 | 0.0 | 14.3 | 7.2 | 19.7 | 7.1 | 7.2 |
| 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 | 21.0 | 4.0 | 20.0 | 7.0 | 18.0 | 4.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.5 | 8.9 | 0.0 | 2.8 | 4.5 | 7.9 | 3.5 | 2.5 |
| Green Ext Time (p_c), s | 0.0 | 9.1 | 0.0 | 0.3 | 0.0 | 7.8 | 0.0 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 550 | 1090 | 170 | 30 | 690 | 60 | 300 | 80 | 70 | 90 | 30 | 260 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 598 | 1185 | 77 | 33 | 750 | 0 | 206 | 254 | 9 | 98 | 33 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 668 | 2474 | 769 | 62 | 1578 | 491 | 318 | 334 | 283 | 214 | 116 | 98 |
| Arrive On Green | 0.19 | 0.49 | 0.49 | 0.02 | 0.31 | 0.00 | 0.18 | 0.18 | 0.18 | 0.06 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1581 | 3442 | 5085 | 1583 | 1774 | 1863 | 1578 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 598 | 1185 | 77 | 33 | 750 | 0 | 206 | 254 | 9 | 98 | 33 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1581 | 1721 | 1695 | 1583 | 1774 | 1863 | 1578 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 12.7 | 11.7 | 2.0 | 0.7 | 8.9 | 0.0 | 8.1 | 9.7 | 0.4 | 2.1 | 1.3 | 0.0 |
| Cycle Q Clear(g_c), s | 12.7 | 11.7 | 2.0 | 0.7 | 8.9 | 0.0 | 8.1 | 9.7 | 0.4 | 2.1 | 1.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 668 | 2474 | 769 | 62 | 1578 | 491 | 318 | 334 | 283 | 214 | 116 | 98 |
| V/C Ratio(X) | 0.90 | 0.48 | 0.10 | 0.53 | 0.48 | 0.00 | 0.65 | 0.76 | 0.03 | 0.46 | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 668 | 2474 | 769 | 129 | 1668 | 519 | 784 | 823 | 697 | 1566 | 848 | 721 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 29.4 | 12.8 | 10.4 | 36.4 | 20.8 | 0.0 | 28.5 | 29.1 | 25.3 | 33.8 | 33.4 | 0.0 |
| Incr Delay (d2), s/veh | 14.3 | 0.4 | 0.1 | 2.6 | 0.6 | 0.0 | 0.8 | 1.4 | 0.0 | 0.6 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.3 | 5.5 | 0.9 | 0.4 | 4.3 | 0.0 | 4.0 | 5.1 | 0.2 | 1.0 | 0.7 | 0.0 |
| LnGrp Delay(d),s/veh | 43.6 | 13.2 | 10.5 | 39.0 | 21.4 | 0.0 | 29.3 | 30.5 | 25.3 | 34.4 | 33.9 | 0.0 |
| LnGrp LOS | D | B | B | D | C | | C | C | C | C | C | |
| Approach Vol, veh/h | | 1860 | | | 783 | | | 469 | | | 131 | |
| Approach Delay, s/veh | | 22.9 | | | 22.2 | | | 29.9 | | | 34.3 | |
| Approach LOS | | C | | | C | | | 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 | 5.8 | 41.8 | | 17.9 | 19.0 | 28.7 | | 9.1 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 2.8 | 36.2 | | 33.0 | 14.5 | 24.5 | | 34.0 |
| Max Q Clear Time (g_c+I1), s | 2.7 | 13.7 | | 11.7 | 14.7 | 10.9 | | 4.1 |
| Green Ext Time (p_c), s | 0.0 | 19.9 | | 1.3 | 0.0 | 12.2 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 24.2 |
| HCM 2010 LOS | C |

| Notes |
|---|
| User approved pedestrian interval to be less than phase max green. |
| User approved volume balancing among the lanes for turning movement. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 190 | 820 | 950 | 610 | 420 | 450 | 850 | 1820 | 430 | 660 | 1510 | 220 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 198 | 854 | 700 | 635 | 438 | 0 | 885 | 1896 | 0 | 688 | 1573 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 247 | 1442 | 449 | 390 | 1676 | 522 | 651 | 1660 | 517 | 435 | 1369 | 426 |
| Arrive On Green | 0.07 | 0.28 | 0.28 | 0.11 | 0.33 | 0.00 | 0.06 | 0.11 | 0.00 | 0.13 | 0.27 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 198 | 854 | 700 | 635 | 438 | 0 | 885 | 1896 | 0 | 688 | 1573 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 7.9 | 20.2 | 39.7 | 15.7 | 8.8 | 0.0 | 26.5 | 45.7 | 0.0 | 17.7 | 37.7 | 0.0 |
| Cycle Q Clear(g_c), s | 7.9 | 20.2 | 39.7 | 15.7 | 8.8 | 0.0 | 26.5 | 45.7 | 0.0 | 17.7 | 37.7 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 247 | 1442 | 449 | 390 | 1676 | 522 | 651 | 1660 | 517 | 435 | 1369 | 426 |
| V/C Ratio(X) | 0.80 | 0.59 | 1.56 | 1.63 | 0.26 | 0.00 | 1.36 | 1.14 | 0.00 | 1.58 | 1.15 | 0.00 |
| Avail Cap(c_a), veh/h | 339 | 1442 | 449 | 390 | 1676 | 522 | 651 | 1660 | 517 | 435 | 1369 | 426 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.09 | 0.09 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 64.0 | 43.2 | 50.2 | 62.2 | 34.4 | 0.0 | 65.6 | 62.5 | 0.0 | 61.2 | 51.2 | 0.0 |
| Incr Delay (d2), s/veh | 6.4 | 1.1 | 262.3 | 294.3 | 0.2 | 0.0 | 162.3 | 64.8 | 0.0 | 272.3 | 75.9 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.0 | 9.6 | 50.1 | 23.5 | 4.2 | 0.0 | 27.3 | 31.4 | 0.0 | 24.9 | 27.2 | 0.0 |
| LnGrp Delay(d),s/veh | 70.4 | 44.3 | 312.5 | 356.5 | 34.7 | 0.0 | 227.9 | 127.2 | 0.0 | 333.5 | 127.0 | 0.0 |
| LnGrp LOS | E | D | F | F | C | | F | F | | F | F | |
| Approach Vol, veh/h | | 1752 | | | 1073 | | | 2781 | | | 2261 | |
| Approach Delay, s/veh | | 154.4 | | | 225.1 | | | 159.3 | | | 189.8 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| 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 | 23.0 | 51.0 | 14.5 | 51.5 | 31.0 | 43.0 | 21.0 | 45.0 |
| Change Period (Y+Rc), s | 5.3 | * 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 5.3 | * 5.3 |
| Max Green Setting (Gmax), s | 17.7 | * 46 | 13.8 | 42.4 | 26.5 | 37.7 | 15.7 | * 40 |
| Max Q Clear Time (g_c+I1), s | 19.7 | 47.7 | 9.9 | 10.8 | 28.5 | 39.7 | 17.7 | 41.7 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 6.8 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 175.9 |
| HCM 2010 LOS | F |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 160 | 860 | 620 | 60 | 480 | 230 | 640 | 920 | 210 | 240 | 550 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 167 | 896 | 555 | 62 | 500 | 200 | 667 | 958 | 90 | 250 | 573 | 14 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 190 | 807 | 488 | 59 | 755 | 300 | 615 | 1356 | 422 | 378 | 678 | 211 |
| Arrive On Green | 0.11 | 0.38 | 0.38 | 0.03 | 0.31 | 0.31 | 0.35 | 0.27 | 0.27 | 0.21 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1774 | 2123 | 1283 | 1774 | 2464 | 980 | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 |
| Grp Volume(v), veh/h | 167 | 743 | 708 | 62 | 358 | 342 | 667 | 958 | 90 | 250 | 573 | 14 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1636 | 1774 | 1770 | 1674 | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 |
| Q Serve(g_s), s | 13.9 | 57.0 | 57.0 | 5.0 | 26.4 | 26.7 | 52.0 | 25.5 | 5.8 | 19.4 | 16.5 | 1.2 |
| Cycle Q Clear(g_c), s | 13.9 | 57.0 | 57.0 | 5.0 | 26.4 | 26.7 | 52.0 | 25.5 | 5.8 | 19.4 | 16.5 | 1.2 |
| Prop In Lane | 1.00 | | 0.78 | 1.00 | | 0.59 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 190 | 672 | 622 | 59 | 542 | 513 | 615 | 1356 | 422 | 378 | 678 | 211 |
| V/C Ratio(X) | 0.88 | 1.11 | 1.14 | 1.05 | 0.66 | 0.67 | 1.08 | 0.71 | 0.21 | 0.66 | 0.85 | 0.07 |
| Avail Cap(c_a), veh/h | 225 | 672 | 622 | 59 | 542 | 513 | 615 | 1356 | 422 | 378 | 678 | 211 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 66.1 | 46.5 | 46.5 | 72.5 | 45.2 | 45.3 | 49.0 | 49.7 | 33.3 | 54.0 | 63.5 | 56.8 |
| Incr Delay (d2), s/veh | 27.7 | 67.1 | 80.7 | 131.2 | 3.0 | 3.3 | 61.3 | 3.1 | 1.2 | 8.8 | 12.3 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.3 | 40.4 | 39.7 | 4.6 | 13.4 | 12.8 | 35.9 | 12.4 | 2.9 | 10.4 | 8.5 | 0.5 |
| LnGrp Delay(d),s/veh | 93.8 | 113.6 | 127.2 | 204.9 | 48.2 | 48.6 | 110.3 | 52.8 | 34.4 | 62.8 | 75.8 | 57.4 |
| LnGrp LOS | F | F | F | F | D | D | F | D | C | E | E | E |
| Approach Vol, veh/h | | 1618 | | | 762 | | | 1715 | | | 837 | |
| Approach Delay, s/veh | | 117.5 | | | 61.1 | | | 74.2 | | | 71.6 | |
| Approach LOS | | F | | | E | | | E | | | E | |

| 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 | 36.0 | 44.0 | 9.0 | 61.0 | 56.0 | 24.0 | 20.0 | 50.0 |
| 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 | 32.0 | 40.0 | 5.0 | 57.0 | 52.0 | 20.0 | 19.0 | 43.0 |
| Max Q Clear Time (g_c+I1), s | 21.4 | 27.5 | 7.0 | 59.0 | 54.0 | 18.5 | 15.9 | 28.7 |
| Green Ext Time (p_c), s | 3.2 | 5.6 | 0.0 | 0.0 | 0.0 | 0.7 | 0.1 | 10.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 86.0 |
| HCM 2010 LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 680 | 0 | 2420 | 160 | 720 | 1690 | 860 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.98 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4702 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4702 | 1362 |
| Peak-hour factor, 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 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 708 | 0 | 2521 | 167 | 750 | 1760 | 896 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 34 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 671 | 0 | 2521 | 133 | 750 | 2056 | 600 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 53.0 | | 66.4 | 66.4 | 53.0 | 140.0 | 140.0 |
| Effective Green, g (s) | | | | | | 53.0 | | 66.4 | 66.4 | 53.0 | 140.0 | 140.0 |
| Actuated g/C Ratio | | | | | | 0.38 | | 0.47 | 0.47 | 0.38 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 609 | | 2411 | 750 | 670 | 4702 | 1362 |
| v/s Ratio Prot | | | | | | 0.42 | | c0.50 | | c0.42 | 0.44 | |
| v/s Ratio Perm | | | | | | | | | 0.08 | | | c0.44 |
| v/c Ratio | | | | | | 1.10 | | 1.05 | 0.18 | 1.12 | 0.44 | 0.44 |
| Uniform Delay, d1 | | | | | | 43.5 | | 36.8 | 21.1 | 43.5 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 0.86 | 0.77 | 0.42 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 67.7 | | 29.3 | 0.2 | 55.9 | 0.0 | 0.1 |
| Delay (s) | | | | | | 111.2 | | 61.1 | 16.6 | 74.1 | 0.0 | 0.1 |
| Level of Service | | | | | | F | | E | B | E | A | A |
| Approach Delay (s) | | 0.0 | | | 111.2 | | | 58.4 | | | 16.3 | |
| Approach LOS | | A | | | F | | | E | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 42.8 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.09 | | |
| Actuated Cycle Length (s) | 140.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 97.4% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 430 | 490 | 2090 | 400 | 0 | 1690 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 448 | 506 | 2177 | 0 | 0 | 1760 |
| Adj No. of Lanes | 2 | 2 | 3 | 1 | 0 | 3 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 800 | 648 | 3089 | 962 | 0 | 3089 |
| Arrive On Green | 0.23 | 0.23 | 0.61 | 0.00 | 0.00 | 0.61 |
| Sat Flow, veh/h | 3442 | 2787 | 5253 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 448 | 506 | 2177 | 0 | 0 | 1760 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1695 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 6.9 | 10.2 | 17.6 | 0.0 | 0.0 | 12.5 |
| Cycle Q Clear(g_c), s | 6.9 | 10.2 | 17.6 | 0.0 | 0.0 | 12.5 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 800 | 648 | 3089 | 962 | 0 | 3089 |
| V/C Ratio(X) | 0.56 | 0.78 | 0.70 | 0.00 | 0.00 | 0.57 |
| Avail Cap(c_a), veh/h | 1378 | 1116 | 3089 | 962 | 0 | 3089 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.70 | 0.00 | 0.00 | 0.90 |
| Uniform Delay (d), s/veh | 20.3 | 21.6 | 8.1 | 0.0 | 0.0 | 7.1 |
| Incr Delay (d2), s/veh | 0.2 | 0.8 | 1.0 | 0.0 | 0.0 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.3 | 3.9 | 8.3 | 0.0 | 0.0 | 5.9 |
| LnGrp Delay(d),s/veh | 20.5 | 22.4 | 9.0 | 0.0 | 0.0 | 7.8 |
| LnGrp LOS | C | C | A | | | A |
| Approach Vol, veh/h | 954 | | 2177 | | | 1760 |
| Approach Delay, s/veh | 21.5 | | 9.0 | | | 7.8 |
| Approach LOS | C | | A | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 51.8 | | | | 51.8 | | 18.2 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 36.4 | | | | 36.4 | | 24.0 |
| Max Q Clear Time (g_c+I1), s | | 19.6 | | | | 14.5 | | 12.2 |
| Green Ext Time (p_c), s | | 15.0 | | | | 19.1 | | 1.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 11.0 |
| HCM 2010 LOS | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 860 | 0 | 650 | 0 | 0 | 0 | 0 | 1630 | 890 | 0 | 1280 | 840 |
| 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 | 869 | 0 | 627 | | | | 0 | 1646 | 0 | 0 | 1293 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1071 | 0 | 867 | | | | 0 | 2708 | 843 | 0 | 2708 | 843 |
| Arrive On Green | 0.31 | 0.00 | 0.31 | | | | 0.00 | 0.53 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 869 | 0 | 627 | | | | 0 | 1646 | 0 | 0 | 1293 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 14.3 | 0.0 | 12.3 | | | | 0.0 | 13.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.3 | 0.0 | 12.3 | | | | 0.0 | 13.7 | 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 | 1071 | 0 | 867 | | | | 0 | 2708 | 843 | 0 | 2708 | 843 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.72 | | | | 0.00 | 0.61 | 0.00 | 0.00 | 0.48 | 0.00 |
| Avail Cap(c_a), veh/h | 1552 | 0 | 1257 | | | | 0 | 2708 | 843 | 0 | 2708 | 843 |
| 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 | 0.81 | 0.00 |
| Uniform Delay (d), s/veh | 19.5 | 0.0 | 18.8 | | | | 0.0 | 9.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.4 | 0.0 | 0.4 | | | | 0.0 | 1.0 | 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 | 7.0 | 0.0 | 4.8 | | | | 0.0 | 6.7 | 0.0 | 0.0 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 20.8 | 0.0 | 19.2 | | | | 0.0 | 11.0 | 0.0 | 0.0 | 0.5 | 0.0 |
| LnGrp LOS | C | | B | | | | | B | | | A | |
| Approach Vol, veh/h | | 1496 | | | | | | 1646 | | | 1293 | |
| Approach Delay, s/veh | | 20.2 | | | | | | 11.0 | | | 0.5 | |
| Approach LOS | | C | | | | | | B | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 46.6 | | 23.4 | | 46.6 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 32.7 | | * 28 | | 32.7 | | |
| Max Q Clear Time (g_c+I1), s | | 15.7 | | 16.3 | | 2.0 | | |
| Green Ext Time (p_c), s | | 12.5 | | 2.8 | | 18.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.0 |
| HCM 2010 LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 40 | 450 | 110 | 80 | 200 | 630 | 1660 | 310 | 180 | 1010 | 430 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 112 | 50 | 159 | 71 | 139 | 19 | 643 | 1694 | 285 | 184 | 1031 | 188 |
| Adj No. of Lanes | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 155 | 69 | 197 | 190 | 345 | 46 | 718 | 2010 | 336 | 209 | 2053 | 582 |
| Arrive On Green | 0.12 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 | 0.21 | 0.46 | 0.46 | 0.12 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1245 | 556 | 1583 | 1774 | 3217 | 432 | 3442 | 4388 | 733 | 1774 | 5588 | 1583 |
| Grp Volume(v), veh/h | 162 | 0 | 159 | 71 | 80 | 78 | 643 | 1306 | 673 | 184 | 1031 | 188 |
| Grp Sat Flow(s),veh/h/ln | 1801 | 0 | 1583 | 1774 | 1863 | 1786 | 1721 | 1695 | 1731 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 8.1 | 0.0 | 9.1 | 3.5 | 3.7 | 3.8 | 16.9 | 31.7 | 32.1 | 9.5 | 13.3 | 7.9 |
| Cycle Q Clear(g_c), s | 8.1 | 0.0 | 9.1 | 3.5 | 3.7 | 3.8 | 16.9 | 31.7 | 32.1 | 9.5 | 13.3 | 7.9 |
| Prop In Lane | 0.69 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 0.42 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 224 | 0 | 197 | 190 | 200 | 192 | 718 | 1553 | 793 | 209 | 2053 | 582 |
| V/C Ratio(X) | 0.72 | 0.00 | 0.81 | 0.37 | 0.40 | 0.41 | 0.90 | 0.84 | 0.85 | 0.88 | 0.50 | 0.32 |
| Avail Cap(c_a), veh/h | 355 | 0 | 313 | 190 | 200 | 192 | 812 | 1553 | 793 | 209 | 2053 | 582 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 0.0 | 39.7 | 38.7 | 38.8 | 38.9 | 35.9 | 22.3 | 22.4 | 40.5 | 22.9 | 21.2 |
| Incr Delay (d2), s/veh | 1.7 | 0.0 | 3.5 | 0.5 | 0.5 | 0.5 | 10.8 | 5.7 | 11.0 | 30.9 | 0.9 | 1.5 |
| 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 | 4.1 | 0.0 | 4.1 | 1.7 | 1.9 | 1.9 | 9.1 | 15.9 | 17.7 | 6.5 | 7.0 | 3.7 |
| LnGrp Delay(d),s/veh | 40.9 | 0.0 | 43.2 | 39.1 | 39.3 | 39.4 | 46.7 | 27.9 | 33.3 | 71.4 | 23.7 | 22.6 |
| LnGrp LOS | D | | D | D | D | D | D | C | C | E | C | C |
| Approach Vol, veh/h | | 321 | | | 229 | | | 2622 | | | 1403 | |
| Approach Delay, s/veh | | 42.0 | | | 39.3 | | | 33.9 | | | 29.8 | |
| Approach LOS | | D | | | D | | | 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 | 15.0 | 54.8 | | 16.2 | 23.4 | 46.3 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 4.0 | 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 11.0 | 42.7 | | 18.4 | 22.0 | 31.7 | | 10.0 |
| Max Q Clear Time (g_c+I1), s | 11.5 | 34.1 | | 11.1 | 18.9 | 15.3 | | 5.8 |
| Green Ext Time (p_c), s | 0.0 | 7.8 | | 0.5 | 0.5 | 14.1 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 33.5 |
| HCM 2010 LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 560 | 0 | 0 | 580 | 0 | 2020 | 860 | 140 | 1430 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1549 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1549 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 0 | 0 | 571 | 0 | 0 | 592 | 0 | 2061 | 878 | 143 | 1459 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 142 | 0 | 0 | 0 | 0 | 0 | 217 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 429 | 0 | 0 | 592 | 0 | 2061 | 661 | 143 | 1459 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 5 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 11.2 | | | 50.0 | | 29.9 | 29.9 | 10.4 | 28.5 | |
| Effective Green, g (s) | | | 11.2 | | | 50.0 | | 29.9 | 29.9 | 10.4 | 28.5 | |
| Actuated g/C Ratio | | | 0.22 | | | 1.00 | | 0.60 | 0.60 | 0.21 | 0.57 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 624 | | | 1591 | | 3040 | 926 | 368 | 3652 | |
| v/s Ratio Prot | | | 0.15 | | | | | 0.41 | | 0.08 | 0.23 | |
| v/s Ratio Perm | | | | | | c0.37 | | | c0.43 | | | |
| v/c Ratio | | | 0.69 | | | 0.37 | | 0.68 | 0.71 | 0.39 | 0.40 | |
| Uniform Delay, d1 | | | 17.8 | | | 0.0 | | 6.8 | 7.1 | 17.1 | 6.0 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.70 | 0.45 | |
| Incremental Delay, d2 | | | 2.5 | | | 0.7 | | 1.2 | 4.7 | 0.3 | 0.2 | |
| Delay (s) | | | 20.3 | | | 0.7 | | 8.0 | 11.7 | 12.3 | 2.9 | |
| Level of Service | | | C | | | A | | A | B | B | A | |
| Approach Delay (s) | | 20.3 | | | 0.7 | | | 9.1 | | | 3.7 | |
| Approach LOS | | C | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 74.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 700 | 930 | 0 | 0 | 810 | 20 | 10 | 10 | 10 | 190 | 0 | 670 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 729 | 969 | 0 | 0 | 844 | 4 | 10 | 10 | 1 | 198 | 0 | 100 |
| Adj No. of Lanes | 2 | 2 | 1 | 1 | 3 | 1 | 0 | 2 | 1 | 2 | 0 | 2 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 852 | 2168 | 970 | 3 | 1510 | 469 | 132 | 131 | 116 | 388 | 0 | 345 |
| Arrive On Green | 0.25 | 0.61 | 0.00 | 0.00 | 0.30 | 0.30 | 0.07 | 0.07 | 0.07 | 0.11 | 0.00 | 0.11 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 1774 | 5085 | 1580 | 1774 | 1770 | 1571 | 3548 | 0 | 3149 |
| Grp Volume(v), veh/h | 729 | 969 | 0 | 0 | 844 | 4 | 10 | 10 | 1 | 198 | 0 | 100 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1774 | 1695 | 1580 | 1774 | 1770 | 1571 | 1774 | 0 | 1575 |
| Q Serve(g_s), s | 11.9 | 8.6 | 0.0 | 0.0 | 8.2 | 0.1 | 0.3 | 0.3 | 0.0 | 3.1 | 0.0 | 1.7 |
| Cycle Q Clear(g_c), s | 11.9 | 8.6 | 0.0 | 0.0 | 8.2 | 0.1 | 0.3 | 0.3 | 0.0 | 3.1 | 0.0 | 1.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 852 | 2168 | 970 | 3 | 1510 | 469 | 132 | 131 | 116 | 388 | 0 | 345 |
| V/C Ratio(X) | 0.86 | 0.45 | 0.00 | 0.00 | 0.56 | 0.01 | 0.08 | 0.08 | 0.01 | 0.51 | 0.00 | 0.29 |
| Avail Cap(c_a), veh/h | 936 | 2168 | 970 | 121 | 1988 | 618 | 784 | 782 | 694 | 1749 | 0 | 1552 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.1 | 6.1 | 0.0 | 0.0 | 17.4 | 14.6 | 25.4 | 25.4 | 25.2 | 24.7 | 0.0 | 24.1 |
| Incr Delay (d2), s/veh | 7.4 | 0.1 | 0.0 | 0.0 | 0.3 | 0.0 | 0.2 | 0.2 | 0.0 | 1.0 | 0.0 | 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 | 6.4 | 4.2 | 0.0 | 0.0 | 3.9 | 0.0 | 0.2 | 0.2 | 0.0 | 1.6 | 0.0 | 0.8 |
| LnGrp Delay(d),s/veh | 28.5 | 6.2 | 0.0 | 0.0 | 17.8 | 14.6 | 25.6 | 25.6 | 25.3 | 25.7 | 0.0 | 24.6 |
| LnGrp LOS | C | A | | | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 1698 | | | 848 | | | 21 | | | 298 | |
| Approach Delay, s/veh | | 15.8 | | | 17.7 | | | 25.6 | | | 25.3 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | 3 | 4 | | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 8.4 | 0.0 | 40.0 | | 10.4 | 18.6 | 21.5 |
| Change Period (Y+Rc), s | | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Max Green Setting (Gmax), s | | 26.0 | 4.0 | 35.0 | | 29.0 | 16.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | | 2.3 | 0.0 | 10.6 | | 5.1 | 13.9 | 10.2 |
| Green Ext Time (p_c), s | | 0.0 | 0.0 | 12.6 | | 1.0 | 0.7 | 7.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.4 |
| HCM 2010 LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 40 | 1080 | 10 | 10 | 770 | 620 | 10 | 10 | 10 | 430 | 20 | 50 |
| 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 43 | 1149 | 10 | 11 | 819 | 211 | 11 | 11 | 2 | 457 | 21 | 22 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 3 | 1 | 0 | 1 | 0 | 2 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 62 | 1570 | 14 | 20 | 2099 | 652 | 0 | 130 | 24 | 589 | 275 | 288 |
| Arrive On Green | 0.04 | 0.44 | 0.44 | 0.01 | 0.41 | 0.41 | 0.00 | 0.08 | 0.08 | 0.17 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1774 | 3595 | 31 | 1774 | 5085 | 1579 | 0 | 1533 | 279 | 3442 | 834 | 873 |
| Grp Volume(v), veh/h | 43 | 565 | 594 | 11 | 819 | 211 | 0 | 0 | 13 | 457 | 0 | 43 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1857 | 1774 | 1695 | 1579 | 0 | 0 | 1811 | 1721 | 0 | 1707 |
| Q Serve(g_s), s | 1.3 | 14.3 | 14.3 | 0.3 | 6.1 | 4.9 | 0.0 | 0.0 | 0.4 | 6.9 | 0.0 | 0.9 |
| Cycle Q Clear(g_c), s | 1.3 | 14.3 | 14.3 | 0.3 | 6.1 | 4.9 | 0.0 | 0.0 | 0.4 | 6.9 | 0.0 | 0.9 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 0.00 | | 0.15 | 1.00 | | 0.51 |
| Lane Grp Cap(c), veh/h | 62 | 773 | 811 | 20 | 2099 | 652 | 0 | 0 | 153 | 589 | 0 | 563 |
| V/C Ratio(X) | 0.69 | 0.73 | 0.73 | 0.55 | 0.39 | 0.32 | 0.00 | 0.00 | 0.08 | 0.78 | 0.00 | 0.08 |
| Avail Cap(c_a), veh/h | 131 | 852 | 894 | 131 | 2448 | 760 | 0 | 0 | 771 | 701 | 0 | 948 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.8 | 12.6 | 12.6 | 26.6 | 11.1 | 10.7 | 0.0 | 0.0 | 22.8 | 21.4 | 0.0 | 12.4 |
| Incr Delay (d2), s/veh | 12.6 | 2.9 | 2.8 | 21.5 | 0.1 | 0.3 | 0.0 | 0.0 | 0.2 | 4.6 | 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 | 0.9 | 7.5 | 7.9 | 0.3 | 2.8 | 2.1 | 0.0 | 0.0 | 0.2 | 3.6 | 0.0 | 0.5 |
| LnGrp Delay(d),s/veh | 38.4 | 15.5 | 15.4 | 48.1 | 11.2 | 11.0 | 0.0 | 0.0 | 23.0 | 26.0 | 0.0 | 12.5 |
| LnGrp LOS | D | B | B | D | B | B | | | C | C | | B |
| Approach Vol, veh/h | | 1202 | | | 1041 | | | 13 | | | 500 | |
| Approach Delay, s/veh | | 16.3 | | | 11.6 | | | 23.0 | | | 24.8 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 13.2 | 8.6 | 4.6 | 27.6 | 0.0 | 21.8 | 5.9 | 26.3 |
| 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 | 11.0 | 23.0 | 4.0 | 26.0 | 4.0 | 30.0 | 4.0 | 26.0 |
| Max Q Clear Time (g_c+I1), s | 8.9 | 2.4 | 2.3 | 16.3 | 0.0 | 2.9 | 3.3 | 8.1 |
| Green Ext Time (p_c), s | 0.4 | 0.2 | 0.0 | 7.3 | 0.0 | 0.2 | 0.0 | 11.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 740 | 320 | 130 | 210 | 270 | 130 | 190 | 1500 | 360 | 180 | 640 | 390 |
| 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 | | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 804 | 348 | 79 | 228 | 293 | 11 | 207 | 1630 | 165 | 196 | 696 | 125 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 734 | 1154 | 252 | 287 | 518 | 229 | 196 | 2497 | 615 | 250 | 1789 | 555 |
| Arrive On Green | 0.21 | 0.28 | 0.28 | 0.08 | 0.15 | 0.15 | 0.11 | 0.39 | 0.39 | 0.07 | 0.35 | 0.35 |
| Sat Flow, veh/h | 3442 | 4173 | 913 | 3442 | 3539 | 1567 | 1774 | 6408 | 1577 | 3442 | 5085 | 1577 |
| Grp Volume(v), veh/h | 804 | 280 | 147 | 228 | 293 | 11 | 207 | 1630 | 165 | 196 | 696 | 125 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1696 | 1721 | 1770 | 1567 | 1774 | 1602 | 1577 | 1721 | 1695 | 1577 |
| Q Serve(g_s), s | 27.0 | 8.2 | 8.7 | 8.2 | 9.7 | 0.8 | 14.0 | 26.3 | 9.0 | 7.1 | 13.0 | 7.1 |
| Cycle Q Clear(g_c), s | 27.0 | 8.2 | 8.7 | 8.2 | 9.7 | 0.8 | 14.0 | 26.3 | 9.0 | 7.1 | 13.0 | 7.1 |
| Prop In Lane | 1.00 | | 0.54 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 734 | 937 | 469 | 287 | 518 | 229 | 196 | 2497 | 615 | 250 | 1789 | 555 |
| V/C Ratio(X) | 1.09 | 0.30 | 0.31 | 0.80 | 0.57 | 0.05 | 1.05 | 0.65 | 0.27 | 0.78 | 0.39 | 0.23 |
| Avail Cap(c_a), veh/h | 734 | 1313 | 657 | 408 | 1035 | 458 | 196 | 2497 | 615 | 299 | 1789 | 555 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.8 | 36.1 | 36.3 | 56.9 | 50.3 | 46.4 | 56.3 | 31.6 | 26.3 | 57.7 | 30.8 | 28.9 |
| Incr Delay (d2), s/veh | 62.1 | 0.2 | 0.4 | 7.0 | 1.0 | 0.1 | 79.3 | 1.3 | 1.1 | 10.8 | 0.6 | 0.9 |
| 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 | 19.1 | 3.9 | 4.1 | 4.2 | 4.8 | 0.3 | 11.1 | 11.9 | 4.1 | 3.8 | 6.2 | 3.2 |
| LnGrp Delay(d),s/veh | 111.8 | 36.3 | 36.6 | 63.9 | 51.2 | 46.5 | 135.6 | 32.9 | 27.4 | 68.5 | 31.4 | 29.8 |
| LnGrp LOS | F | D | D | E | D | D | F | C | C | E | C | C |
| Approach Vol, veh/h | | 1231 | | | 532 | | | 2002 | | | 1017 | |
| Approach Delay, s/veh | | 85.7 | | | 56.6 | | | 43.1 | | | 38.4 | |
| Approach LOS | | F | | | E | | | D | | | 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 | 14.2 | 55.0 | 16.5 | 40.8 | 19.0 | 50.2 | 33.0 | 24.3 |
| Change Period (Y+Rc), s | 5.0 | 5.7 | 6.0 | * 5.8 | 5.0 | 5.7 | 6.0 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 47.5 | 15.0 | * 49 | 14.0 | 44.5 | 27.0 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 9.1 | 28.3 | 10.2 | 10.7 | 16.0 | 15.0 | 29.0 | 11.7 |
| Green Ext Time (p_c), s | 0.1 | 15.9 | 0.3 | 5.4 | 0.0 | 22.6 | 0.0 | 5.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 54.5 |
| HCM 2010 LOS | D |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 60 | 1410 | 440 | 200 | 880 | 20 | 420 | 20 | 190 | 20 | 20 | 180 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 65 | 1516 | 251 | 215 | 946 | 9 | 468 | 0 | 27 | 22 | 22 | 27 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 83 | 2116 | 659 | 252 | 2599 | 799 | 579 | 0 | 258 | 61 | 64 | 54 |
| Arrive On Green | 0.05 | 0.42 | 0.42 | 0.14 | 0.51 | 0.51 | 0.16 | 0.00 | 0.16 | 0.03 | 0.03 | 0.03 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 65 | 1516 | 251 | 215 | 946 | 9 | 468 | 0 | 27 | 22 | 22 | 27 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 3.0 | 20.3 | 9.0 | 9.7 | 9.1 | 0.2 | 10.4 | 0.0 | 1.2 | 1.0 | 0.9 | 1.4 |
| Cycle Q Clear(g_c), s | 3.0 | 20.3 | 9.0 | 9.7 | 9.1 | 0.2 | 10.4 | 0.0 | 1.2 | 1.0 | 0.9 | 1.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 83 | 2116 | 659 | 252 | 2599 | 799 | 579 | 0 | 258 | 61 | 64 | 54 |
| V/C Ratio(X) | 0.78 | 0.72 | 0.38 | 0.85 | 0.36 | 0.01 | 0.81 | 0.00 | 0.10 | 0.36 | 0.34 | 0.50 |
| Avail Cap(c_a), veh/h | 189 | 2208 | 687 | 271 | 2599 | 799 | 1649 | 0 | 736 | 846 | 888 | 755 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.6 | 19.9 | 16.6 | 34.3 | 12.0 | 9.8 | 33.0 | 0.0 | 29.1 | 38.6 | 38.6 | 38.8 |
| Incr Delay (d2), s/veh | 5.8 | 1.9 | 1.4 | 19.9 | 0.4 | 0.0 | 1.0 | 0.0 | 0.1 | 1.3 | 1.2 | 2.6 |
| 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 | 1.6 | 9.8 | 4.2 | 6.1 | 4.3 | 0.1 | 5.2 | 0.0 | 0.5 | 0.5 | 0.5 | 0.6 |
| LnGrp Delay(d),s/veh | 44.4 | 21.8 | 18.0 | 54.2 | 12.4 | 9.9 | 34.0 | 0.0 | 29.2 | 40.0 | 39.8 | 41.4 |
| LnGrp LOS | D | C | B | D | B | A | C | | C | D | D | D |
| Approach Vol, veh/h | | 1832 | | | 1170 | | | 495 | | | 71 | |
| Approach Delay, s/veh | | 22.0 | | | 20.0 | | | 33.8 | | | 40.4 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 8.3 | 48.3 | | 7.3 | 16.1 | 40.5 | | 17.8 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 8.7 | 39.3 | | 39.0 | 12.5 | * 36 | | 38.0 |
| Max Q Clear Time (g_c+I1), s | 5.0 | 11.1 | | 3.4 | 11.7 | 22.3 | | 12.4 |
| Green Ext Time (p_c), s | 0.0 | 27.5 | | 0.1 | 0.0 | 11.7 | | 0.9 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 23.4 |
| HCM 2010 LOS | | | C |

**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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 1310 | 190 | 50 | 780 | 130 | 230 | 30 | 90 | 130 | 20 | 90 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 122 | 1337 | 73 | 51 | 796 | 42 | 235 | 31 | 14 | 133 | 20 | 11 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 156 | 2311 | 719 | 80 | 2094 | 652 | 286 | 200 | 170 | 188 | 59 | 32 |
| Arrive On Green | 0.09 | 0.45 | 0.45 | 0.05 | 0.41 | 0.41 | 0.16 | 0.11 | 0.11 | 0.11 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1131 | 622 |
| Grp Volume(v), veh/h | 122 | 1337 | 73 | 51 | 796 | 42 | 235 | 31 | 14 | 133 | 0 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1753 |
| Q Serve(g_s), s | 4.7 | 13.5 | 1.8 | 2.0 | 7.6 | 1.1 | 8.9 | 1.1 | 0.6 | 5.0 | 0.0 | 1.2 |
| Cycle Q Clear(g_c), s | 4.7 | 13.5 | 1.8 | 2.0 | 7.6 | 1.1 | 8.9 | 1.1 | 0.6 | 5.0 | 0.0 | 1.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.35 |
| Lane Grp Cap(c), veh/h | 156 | 2311 | 719 | 80 | 2094 | 652 | 286 | 200 | 170 | 188 | 0 | 91 |
| V/C Ratio(X) | 0.78 | 0.58 | 0.10 | 0.64 | 0.38 | 0.06 | 0.82 | 0.16 | 0.08 | 0.71 | 0.00 | 0.34 |
| Avail Cap(c_a), veh/h | 290 | 2432 | 757 | 153 | 2094 | 652 | 502 | 1060 | 901 | 410 | 0 | 906 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.1 | 14.1 | 10.9 | 32.7 | 14.3 | 12.4 | 28.2 | 28.2 | 28.0 | 30.1 | 0.0 | 31.9 |
| Incr Delay (d2), s/veh | 3.3 | 0.7 | 0.2 | 3.1 | 0.2 | 0.1 | 5.8 | 0.4 | 0.2 | 4.8 | 0.0 | 2.2 |
| 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 | 2.4 | 6.5 | 0.8 | 1.0 | 3.6 | 0.5 | 4.8 | 0.6 | 0.3 | 2.7 | 0.0 | 0.6 |
| LnGrp Delay(d),s/veh | 34.4 | 14.7 | 11.0 | 35.8 | 14.5 | 12.5 | 34.0 | 28.6 | 28.2 | 34.9 | 0.0 | 34.1 |
| LnGrp LOS | C | B | B | D | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 1532 | | | 889 | | | 280 | | | 164 | |
| Approach Delay, s/veh | | 16.1 | | | 15.6 | | | 33.1 | | | 34.7 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 7.6 | 38.1 | 15.7 | 8.1 | 10.6 | 35.2 | 11.9 | 12.0 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 6.0 | * 33 | 19.7 | 36.0 | 11.4 | 27.9 | 16.1 | 39.6 |
| Max Q Clear Time (g_c+I1), s | 4.0 | 15.5 | 10.9 | 3.2 | 6.7 | 9.6 | 7.0 | 3.1 |
| Green Ext Time (p_c), s | 0.0 | 16.1 | 0.4 | 0.4 | 0.1 | 17.0 | 0.2 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.7 |
| HCM 2010 LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 70 | 0 | 490 | 0 | 1260 | 40 | 0 | 920 | 630 |
| 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 | 0 | 1863 | 0 | 1863 | 1900 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 73 | 0 | 425 | 0 | 1312 | 0 | 0 | 958 | 0 |
| Adj No. of Lanes | | | | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 1 |
| Peak Hour Factor | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 364 | 0 | 572 | 0 | 1922 | 0 | 0 | 1922 | 860 |
| Arrive On Green | | | | 0.21 | 0.00 | 0.21 | 0.00 | 0.54 | 0.00 | 0.00 | 0.54 | 0.00 |
| Sat Flow, veh/h | | | | 1774 | 0 | 2787 | 0 | 3725 | 0 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | | | | 73 | 0 | 425 | 0 | 1312 | 0 | 0 | 958 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1774 | 0 | 1393 | 0 | 1770 | 0 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | | | | 1.2 | 0.0 | 4.9 | 0.0 | 9.3 | 0.0 | 0.0 | 5.9 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 1.2 | 0.0 | 4.9 | 0.0 | 9.3 | 0.0 | 0.0 | 5.9 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 364 | 0 | 572 | 0 | 1922 | 0 | 0 | 1922 | 860 |
| V/C Ratio(X) | | | | 0.20 | 0.00 | 0.74 | 0.00 | 0.68 | 0.00 | 0.00 | 0.50 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 457 | 0 | 718 | 0 | 2808 | 0 | 0 | 2808 | 1256 |
| 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 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 11.4 | 0.0 | 12.9 | 0.0 | 5.7 | 0.0 | 0.0 | 4.9 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.1 | 0.0 | 2.2 | 0.0 | 0.2 | 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 | | | | 0.6 | 0.0 | 2.1 | 0.0 | 4.4 | 0.0 | 0.0 | 2.8 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 11.5 | 0.0 | 15.1 | 0.0 | 5.9 | 0.0 | 0.0 | 5.0 | 0.0 |
| LnGrp LOS | | | | B | | B | | A | | | A | |
| Approach Vol, veh/h | | | | | 498 | | | 1312 | | | 958 | |
| Approach Delay, s/veh | | | | | 14.6 | | | 5.9 | | | 5.0 | |
| 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 | | 23.4 | | | | 23.4 | | 11.2 |
| Change Period (Y+Rc), s | | 4.6 | | | | 4.6 | | 4.1 |
| Max Green Setting (Gmax), s | | 27.4 | | | | 27.4 | | 8.9 |
| Max Q Clear Time (g_c+I1), s | | 11.3 | | | | 7.9 | | 6.9 |
| Green Ext Time (p_c), s | | 7.4 | | | | 8.0 | | 0.2 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 7.2 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 460 | 40 | 460 | 0 | 0 | 0 | 0 | 840 | 80 | 0 | 990 | 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 | 1863 | 1863 | 1863 | | | | 0 | 1863 | 1863 | 0 | 1863 | 0 |
| Adj Flow Rate, veh/h | 509 | 0 | 454 | | | | 0 | 875 | 51 | 0 | 1031 | 0 |
| Adj No. of Lanes | 2 | 0 | 1 | | | | 0 | 2 | 1 | 0 | 2 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 0 |
| Cap, veh/h | 1249 | 0 | 556 | | | | 0 | 1581 | 706 | 0 | 1581 | 0 |
| Arrive On Green | 0.35 | 0.00 | 0.35 | | | | 0.00 | 0.45 | 0.45 | 0.00 | 0.45 | 0.00 |
| Sat Flow, veh/h | 3548 | 0 | 1581 | | | | 0 | 3632 | 1581 | 0 | 3725 | 0 |
| Grp Volume(v), veh/h | 509 | 0 | 454 | | | | 0 | 875 | 51 | 0 | 1031 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1581 | | | | 0 | 1770 | 1581 | 0 | 1770 | 0 |
| Q Serve(g_s), s | 4.7 | 0.0 | 11.3 | | | | 0.0 | 7.9 | 0.8 | 0.0 | 9.8 | 0.0 |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 11.3 | | | | 0.0 | 7.9 | 0.8 | 0.0 | 9.8 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 1249 | 0 | 556 | | | | 0 | 1581 | 706 | 0 | 1581 | 0 |
| V/C Ratio(X) | 0.41 | 0.00 | 0.82 | | | | 0.00 | 0.55 | 0.07 | 0.00 | 0.65 | 0.00 |
| Avail Cap(c_a), veh/h | 2380 | 0 | 1060 | | | | 0 | 2235 | 998 | 0 | 2235 | 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 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.6 | 0.0 | 12.7 | | | | 0.0 | 8.8 | 6.8 | 0.0 | 9.3 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 1.1 | | | | 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 | 2.3 | 0.0 | 5.1 | | | | 0.0 | 3.8 | 0.3 | 0.0 | 4.8 | 0.0 |
| LnGrp Delay(d),s/veh | 10.7 | 0.0 | 13.9 | | | | 0.0 | 8.9 | 6.9 | 0.0 | 9.5 | 0.0 |
| LnGrp LOS | B | | B | | | | | A | A | | A | |
| Approach Vol, veh/h | | 963 | | | | | | 926 | | | 1031 | |
| Approach Delay, s/veh | | 12.2 | | | | | | 8.8 | | | 9.5 | |
| 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 | | 23.9 | | 19.3 | | 23.9 | | |
| Change Period (Y+Rc), s | | 4.6 | | 4.1 | | 4.6 | | |
| Max Green Setting (Gmax), s | | 27.3 | | 29.0 | | 27.3 | | |
| Max Q Clear Time (g_c+I1), s | | 9.9 | | 13.3 | | 11.8 | | |
| Green Ext Time (p_c), s | | 8.0 | | 1.8 | | 7.5 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 10.2 |
| HCM 2010 LOS | | | B |

| Notes |
|---|
| User approved volume balancing among the lanes for turning movement. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 260 | 0 | 490 | 0 | 1280 | 530 | 0 | 1130 | 100 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 283 | 0 | 492 | 0 | 1391 | 0 | 0 | 1228 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 824 | 0 | 667 | 0 | 3209 | 999 | 0 | 3209 | 999 |
| Arrive On Green | | | | 0.24 | 0.00 | 0.24 | 0.00 | 1.00 | 0.00 | 0.00 | 0.63 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | | | | 283 | 0 | 492 | 0 | 1391 | 0 | 0 | 1228 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | | | | 4.2 | 0.0 | 10.1 | 0.0 | 0.0 | 0.0 | 0.0 | 7.3 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 4.2 | 0.0 | 10.1 | 0.0 | 0.0 | 0.0 | 0.0 | 7.3 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 824 | 0 | 667 | 0 | 3209 | 999 | 0 | 3209 | 999 |
| V/C Ratio(X) | | | | 0.34 | 0.00 | 0.74 | 0.00 | 0.43 | 0.00 | 0.00 | 0.38 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 1559 | 0 | 1263 | 0 | 3209 | 999 | 0 | 3209 | 999 |
| 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 | 0.87 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 19.5 | 0.0 | 21.7 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 1.6 | 0.0 | 0.4 | 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 | | | | 2.0 | 0.0 | 4.0 | 0.0 | 0.1 | 0.0 | 0.0 | 3.4 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 19.7 | 0.0 | 23.3 | 0.0 | 0.4 | 0.0 | 0.0 | 5.9 | 0.0 |
| LnGrp LOS | | | | B | | C | | A | | | A | |
| Approach Vol, veh/h | | | | | 775 | | | 1391 | | | 1228 | |
| Approach Delay, s/veh | | | | | 22.0 | | | 0.4 | | | 5.9 | |
| Approach LOS | | | | | C | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 56.2 | | | | 56.2 | | 18.8 |
| Change Period (Y+Rc), s | | 4.0 | | | | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | | 39.0 | | | | 39.0 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | | 9.3 | | 12.1 |
| Green Ext Time (p_c), s | | 25.7 | | | | 22.0 | | 2.7 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 7.3 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 430 | 0 | 650 | 0 | 0 | 0 | 0 | 1380 | 210 | 0 | 850 | 540 |
| 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 | 467 | 0 | 682 | | | | 0 | 1500 | 0 | 0 | 924 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1079 | 0 | 874 | | | | 0 | 2871 | 894 | 0 | 2871 | 894 |
| Arrive On Green | 0.31 | 0.00 | 0.31 | | | | 0.00 | 0.56 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 467 | 0 | 682 | | | | 0 | 1500 | 0 | 0 | 924 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 7.1 | 0.0 | 14.6 | | | | 0.0 | 11.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 7.1 | 0.0 | 14.6 | | | | 0.0 | 11.9 | 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 | 1079 | 0 | 874 | | | | 0 | 2871 | 894 | 0 | 2871 | 894 |
| V/C Ratio(X) | 0.43 | 0.00 | 0.78 | | | | 0.00 | 0.52 | 0.00 | 0.00 | 0.32 | 0.00 |
| Avail Cap(c_a), veh/h | 1575 | 0 | 1275 | | | | 0 | 2871 | 894 | 0 | 2871 | 894 |
| 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 | 0.94 | 0.00 |
| Uniform Delay (d), s/veh | 17.9 | 0.0 | 20.5 | | | | 0.0 | 8.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 1.9 | | | | 0.0 | 0.7 | 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 | 3.4 | 0.0 | 5.8 | | | | 0.0 | 5.7 | 0.0 | 0.0 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 18.1 | 0.0 | 22.4 | | | | 0.0 | 9.5 | 0.0 | 0.0 | 0.3 | 0.0 |
| LnGrp LOS | B | | C | | | | | A | | | A | |
| Approach Vol, veh/h | | 1149 | | | | | | 1500 | | | 924 | |
| Approach Delay, s/veh | | 20.7 | | | | | | 9.5 | | | 0.3 | |
| Approach LOS | | C | | | | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 50.5 | | 24.5 | | 50.5 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 37.0 | | 30.0 | | 37.0 | | |
| Max Q Clear Time (g_c+I1), s | | 13.9 | | 16.6 | | 2.0 | | |
| Green Ext Time (p_c), s | | 17.0 | | 4.0 | | 22.9 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 10.7 |
| HCM 2010 LOS | | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 490 | 320 | 90 | 110 | 340 | 390 | 60 | 1640 | 90 | 520 | 1120 | 290 |
| 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 | | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 533 | 348 | 21 | 120 | 370 | 213 | 65 | 1783 | 32 | 565 | 1217 | 147 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 548 | 1512 | 468 | 170 | 954 | 295 | 106 | 1858 | 576 | 574 | 2549 | 791 |
| Arrive On Green | 0.16 | 0.30 | 0.30 | 0.05 | 0.19 | 0.19 | 0.03 | 0.37 | 0.37 | 0.17 | 0.50 | 0.50 |
| Sat Flow, veh/h | 3442 | 5085 | 1575 | 3442 | 5085 | 1571 | 3442 | 5085 | 1577 | 3442 | 5085 | 1579 |
| Grp Volume(v), veh/h | 533 | 348 | 21 | 120 | 370 | 213 | 65 | 1783 | 32 | 565 | 1217 | 147 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1575 | 1721 | 1695 | 1571 | 1721 | 1695 | 1577 | 1721 | 1695 | 1579 |
| Q Serve(g_s), s | 20.3 | 6.8 | 1.3 | 4.5 | 8.4 | 16.8 | 2.5 | 45.2 | 1.7 | 21.6 | 20.7 | 6.8 |
| Cycle Q Clear(g_c), s | 20.3 | 6.8 | 1.3 | 4.5 | 8.4 | 16.8 | 2.5 | 45.2 | 1.7 | 21.6 | 20.7 | 6.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 548 | 1512 | 468 | 170 | 954 | 295 | 106 | 1858 | 576 | 574 | 2549 | 791 |
| V/C Ratio(X) | 0.97 | 0.23 | 0.04 | 0.71 | 0.39 | 0.72 | 0.61 | 0.96 | 0.06 | 0.98 | 0.48 | 0.19 |
| Avail Cap(c_a), veh/h | 548 | 1695 | 525 | 235 | 1233 | 381 | 156 | 1888 | 585 | 574 | 2549 | 791 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.2 | 35.0 | 33.0 | 61.8 | 47.0 | 50.4 | 63.2 | 40.9 | 27.1 | 54.8 | 21.6 | 18.1 |
| Incr Delay (d2), s/veh | 31.6 | 0.1 | 0.0 | 5.7 | 0.3 | 4.7 | 5.6 | 12.5 | 0.0 | 33.6 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.1 | 3.2 | 0.6 | 2.3 | 4.0 | 7.7 | 1.3 | 23.3 | 0.8 | 13.0 | 9.7 | 3.0 |
| LnGrp Delay(d),s/veh | 86.8 | 35.1 | 33.1 | 67.5 | 47.2 | 55.1 | 68.8 | 53.4 | 27.2 | 88.4 | 21.7 | 18.2 |
| LnGrp LOS | F | D | C | E | D | E | E | D | C | F | C | B |
| Approach Vol, veh/h | | 902 | | | 703 | | | 1880 | | | 1929 | |
| Approach Delay, s/veh | | 65.6 | | | 53.1 | | | 53.5 | | | 41.0 | |
| Approach LOS | | E | | | D | | | D | | | 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 | 26.0 | 52.2 | 10.5 | 43.2 | 8.1 | 70.2 | 25.0 | 28.8 |
| 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 | 22.0 | 49.0 | 9.0 | 44.0 | 6.0 | 65.0 | 21.0 | 32.0 |
| Max Q Clear Time (g_c+I1), s | 23.6 | 47.2 | 6.5 | 8.8 | 4.5 | 22.7 | 22.3 | 18.8 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | 0.1 | 6.0 | 0.0 | 33.6 | 0.0 | 4.4 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 51.0 |
| HCM 2010 LOS | | | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 520 | 300 | 30 | 520 | 110 | 250 | 260 | 20 | 120 | 340 | 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 120 | 565 | 101 | 33 | 565 | 34 | 272 | 283 | 5 | 130 | 370 | 14 |
| Adj No. of Lanes | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 715 | 606 | 44 | 662 | 561 | 308 | 613 | 517 | 162 | 460 | 389 |
| Arrive On Green | 0.05 | 0.38 | 0.38 | 0.02 | 0.36 | 0.36 | 0.17 | 0.33 | 0.33 | 0.09 | 0.25 | 0.25 |
| Sat Flow, veh/h | 3442 | 1863 | 1577 | 1774 | 1863 | 1577 | 1774 | 1863 | 1571 | 1774 | 1863 | 1574 |
| Grp Volume(v), veh/h | 120 | 565 | 101 | 33 | 565 | 34 | 272 | 283 | 5 | 130 | 370 | 14 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1577 | 1774 | 1863 | 1577 | 1774 | 1863 | 1571 | 1774 | 1863 | 1574 |
| Q Serve(g_s), s | 3.2 | 25.2 | 4.0 | 1.7 | 26.3 | 1.3 | 14.0 | 11.3 | 0.2 | 6.7 | 17.5 | 0.6 |
| Cycle Q Clear(g_c), s | 3.2 | 25.2 | 4.0 | 1.7 | 26.3 | 1.3 | 14.0 | 11.3 | 0.2 | 6.7 | 17.5 | 0.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 183 | 715 | 606 | 44 | 662 | 561 | 308 | 613 | 517 | 162 | 460 | 389 |
| V/C Ratio(X) | 0.66 | 0.79 | 0.17 | 0.76 | 0.85 | 0.06 | 0.88 | 0.46 | 0.01 | 0.80 | 0.80 | 0.04 |
| Avail Cap(c_a), veh/h | 183 | 735 | 622 | 113 | 755 | 639 | 378 | 715 | 603 | 284 | 616 | 520 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.6 | 25.5 | 19.0 | 45.5 | 28.0 | 19.9 | 37.8 | 24.9 | 21.2 | 41.8 | 33.2 | 26.8 |
| Incr Delay (d2), s/veh | 8.2 | 5.7 | 0.1 | 22.9 | 8.5 | 0.0 | 18.2 | 0.5 | 0.0 | 8.8 | 5.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 | 14.0 | 1.7 | 1.1 | 15.1 | 0.6 | 8.4 | 5.9 | 0.1 | 3.7 | 9.7 | 0.3 |
| LnGrp Delay(d),s/veh | 51.8 | 31.2 | 19.1 | 68.3 | 36.4 | 20.0 | 56.0 | 25.4 | 21.2 | 50.6 | 38.9 | 26.9 |
| LnGrp LOS | D | C | B | E | D | B | E | C | C | D | D | C |
| Approach Vol, veh/h | | 786 | | | 632 | | | 560 | | | 514 | |
| Approach Delay, s/veh | | 32.8 | | | 37.2 | | | 40.2 | | | 41.5 | |
| Approach LOS | | C | | | D | | | D | | | 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 | 12.6 | 34.9 | 6.3 | 40.0 | 20.3 | 27.2 | 9.0 | 37.4 |
| 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 | 15.0 | 36.0 | 6.0 | 37.0 | 20.0 | 31.0 | 5.0 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 8.7 | 13.3 | 3.7 | 27.2 | 16.0 | 19.5 | 5.2 | 28.3 |
| Green Ext Time (p_c), s | 0.1 | 3.6 | 0.0 | 5.1 | 0.3 | 2.8 | 0.0 | 5.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 37.4 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 130 | 60 | 160 | 50 | 60 | 10 | 160 | 1130 | 60 | 10 | 1000 | 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 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 103 | 118 | 14 | 54 | 65 | 2 | 174 | 1228 | 61 | 11 | 1087 | 51 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 217 | 228 | 191 | 150 | 152 | 5 | 219 | 2312 | 115 | 20 | 1801 | 557 |
| Arrive On Green | 0.12 | 0.12 | 0.12 | 0.08 | 0.08 | 0.08 | 0.12 | 0.47 | 0.47 | 0.01 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1774 | 1863 | 1564 | 1774 | 1797 | 55 | 1774 | 4961 | 246 | 1774 | 5085 | 1572 |
| Grp Volume(v), veh/h | 103 | 118 | 14 | 54 | 0 | 67 | 174 | 839 | 450 | 11 | 1087 | 51 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1564 | 1774 | 0 | 1852 | 1774 | 1695 | 1818 | 1774 | 1695 | 1572 |
| Q Serve(g_s), s | 2.7 | 3.0 | 0.4 | 1.5 | 0.0 | 1.7 | 4.8 | 8.9 | 8.9 | 0.3 | 8.9 | 1.1 |
| Cycle Q Clear(g_c), s | 2.7 | 3.0 | 0.4 | 1.5 | 0.0 | 1.7 | 4.8 | 8.9 | 8.9 | 0.3 | 8.9 | 1.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.03 | 1.00 | | 0.14 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 217 | 228 | 191 | 150 | 0 | 157 | 219 | 1580 | 847 | 20 | 1801 | 557 |
| V/C Ratio(X) | 0.48 | 0.52 | 0.07 | 0.36 | 0.00 | 0.43 | 0.80 | 0.53 | 0.53 | 0.55 | 0.60 | 0.09 |
| Avail Cap(c_a), veh/h | 805 | 845 | 710 | 1015 | 0 | 1060 | 245 | 1580 | 847 | 140 | 2007 | 620 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.7 | 20.8 | 19.7 | 21.9 | 0.0 | 22.0 | 21.6 | 9.6 | 9.6 | 24.9 | 13.4 | 10.9 |
| Incr Delay (d2), s/veh | 1.6 | 1.8 | 0.2 | 1.4 | 0.0 | 1.8 | 15.0 | 0.3 | 0.6 | 21.2 | 0.4 | 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 | 1.4 | 1.7 | 0.2 | 0.8 | 0.0 | 1.0 | 3.3 | 4.2 | 4.5 | 0.3 | 4.2 | 0.5 |
| LnGrp Delay(d),s/veh | 22.3 | 22.7 | 19.9 | 23.3 | 0.0 | 23.9 | 36.6 | 9.9 | 10.2 | 46.1 | 13.9 | 11.0 |
| LnGrp LOS | C | C | B | C | | C | D | A | B | D | B | B |
| Approach Vol, veh/h | | 235 | | | 121 | | | 1463 | | | 1149 | |
| Approach Delay, s/veh | | 22.4 | | | 23.6 | | | 13.2 | | | 14.1 | |
| Approach LOS | | C | | | C | | | 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 | 4.6 | 27.6 | | 10.2 | 10.2 | 21.9 | | 8.3 |
| Change Period (Y+Rc), s | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | 4.0 | 23.0 | | 23.0 | 7.0 | 20.0 | | 29.0 |
| Max Q Clear Time (g_c+I1), s | 2.3 | 10.9 | | 5.0 | 6.8 | 10.9 | | 3.7 |
| Green Ext Time (p_c), s | 0.0 | 9.8 | | 0.8 | 0.0 | 6.9 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.7 |
| HCM 2010 LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 10 | 10 | 10 | 30 | 210 | 10 | 1470 | 10 | 120 | 1140 | 60 |
| 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 | | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 120 | 11 | 2 | 11 | 33 | 118 | 11 | 1598 | 4 | 130 | 1239 | 29 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 153 | 347 | 63 | 20 | 54 | 192 | 20 | 2202 | 683 | 164 | 2617 | 811 |
| Arrive On Green | 0.09 | 0.23 | 0.23 | 0.01 | 0.15 | 0.15 | 0.01 | 0.43 | 0.43 | 0.09 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1774 | 1533 | 279 | 1774 | 355 | 1269 | 1774 | 5085 | 1578 | 1774 | 5085 | 1576 |
| Grp Volume(v), veh/h | 120 | 0 | 13 | 11 | 0 | 151 | 11 | 1598 | 4 | 130 | 1239 | 29 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1811 | 1774 | 0 | 1624 | 1774 | 1695 | 1578 | 1774 | 1695 | 1576 |
| Q Serve(g_s), s | 4.5 | 0.0 | 0.4 | 0.4 | 0.0 | 5.9 | 0.4 | 17.5 | 0.1 | 4.8 | 10.6 | 0.6 |
| Cycle Q Clear(g_c), s | 4.5 | 0.0 | 0.4 | 0.4 | 0.0 | 5.9 | 0.4 | 17.5 | 0.1 | 4.8 | 10.6 | 0.6 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.78 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 153 | 0 | 410 | 20 | 0 | 246 | 20 | 2202 | 683 | 164 | 2617 | 811 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.03 | 0.56 | 0.00 | 0.61 | 0.56 | 0.73 | 0.01 | 0.79 | 0.47 | 0.04 |
| Avail Cap(c_a), veh/h | 184 | 0 | 858 | 105 | 0 | 697 | 105 | 2334 | 724 | 184 | 2617 | 811 |
| 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 | 30.3 | 0.0 | 20.4 | 33.2 | 0.0 | 26.8 | 33.2 | 15.8 | 10.9 | 30.0 | 10.5 | 8.1 |
| Incr Delay (d2), s/veh | 16.8 | 0.0 | 0.0 | 22.8 | 0.0 | 2.5 | 22.8 | 1.1 | 0.0 | 18.8 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 0.0 | 0.2 | 0.3 | 0.0 | 2.8 | 0.3 | 8.4 | 0.0 | 3.2 | 5.0 | 0.3 |
| LnGrp Delay(d),s/veh | 47.1 | 0.0 | 20.4 | 56.0 | 0.0 | 29.3 | 56.0 | 16.9 | 10.9 | 48.8 | 10.7 | 8.1 |
| LnGrp LOS | D | | C | E | | C | E | B | B | D | B | A |
| Approach Vol, veh/h | | 133 | | | 162 | | | 1613 | | | 1398 | |
| Approach Delay, s/veh | | 44.5 | | | 31.1 | | | 17.2 | | | 14.1 | |
| Approach LOS | | D | | | 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 | 10.3 | 33.3 | 4.7 | 19.3 | 4.7 | 38.8 | 9.8 | 14.2 |
| 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 | 7.0 | 31.0 | 4.0 | 32.0 | 4.0 | 34.0 | 7.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 6.8 | 19.5 | 2.4 | 2.4 | 2.4 | 12.6 | 6.5 | 7.9 |
| Green Ext Time (p_c), s | 0.0 | 9.7 | 0.0 | 0.9 | 0.0 | 18.0 | 0.0 | 0.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 17.7 |
| HCM 2010 LOS | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 40 | 10 | 10 | 190 | 380 | 20 | 60 | 10 | 610 | 20 | 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 | | 0.98 | 1.00 | | 0.97 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 98 | 43 | 2 | 11 | 207 | 55 | 22 | 65 | 3 | 663 | 22 | 19 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 125 | 382 | 18 | 20 | 292 | 245 | 36 | 149 | 7 | 740 | 443 | 383 |
| Arrive On Green | 0.07 | 0.22 | 0.22 | 0.01 | 0.16 | 0.16 | 0.02 | 0.08 | 0.08 | 0.42 | 0.48 | 0.48 |
| Sat Flow, veh/h | 1774 | 1765 | 82 | 1774 | 1863 | 1558 | 1774 | 1764 | 81 | 1774 | 922 | 796 |
| Grp Volume(v), veh/h | 98 | 0 | 45 | 11 | 207 | 55 | 22 | 0 | 68 | 663 | 0 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1847 | 1774 | 1863 | 1558 | 1774 | 0 | 1845 | 1774 | 0 | 1717 |
| Q Serve(g_s), s | 3.2 | 0.0 | 1.2 | 0.4 | 6.2 | 1.8 | 0.7 | 0.0 | 2.1 | 20.5 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | 3.2 | 0.0 | 1.2 | 0.4 | 6.2 | 1.8 | 0.7 | 0.0 | 2.1 | 20.5 | 0.0 | 0.8 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 1.00 | | 0.04 | 1.00 | | 0.46 |
| Lane Grp Cap(c), veh/h | 125 | 0 | 400 | 20 | 292 | 245 | 36 | 0 | 155 | 740 | 0 | 826 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.11 | 0.55 | 0.71 | 0.22 | 0.60 | 0.00 | 0.44 | 0.90 | 0.00 | 0.05 |
| Avail Cap(c_a), veh/h | 180 | 0 | 500 | 120 | 441 | 369 | 150 | 0 | 531 | 1111 | 0 | 1424 |
| 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 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.0 | 0.0 | 18.6 | 29.1 | 23.6 | 21.8 | 28.7 | 0.0 | 25.7 | 16.0 | 0.0 | 8.2 |
| Incr Delay (d2), s/veh | 12.9 | 0.0 | 0.1 | 22.0 | 3.1 | 0.5 | 15.1 | 0.0 | 1.9 | 6.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 0.6 | 0.3 | 3.5 | 0.8 | 0.5 | 0.0 | 1.1 | 11.3 | 0.0 | 0.4 |
| LnGrp Delay(d),s/veh | 39.9 | 0.0 | 18.7 | 51.1 | 26.8 | 22.2 | 43.8 | 0.0 | 27.7 | 22.7 | 0.0 | 8.2 |
| LnGrp LOS | D | | B | D | C | C | D | | C | C | | A |
| Approach Vol, veh/h | | 143 | | | 273 | | | 90 | | | 704 | |
| Approach Delay, s/veh | | 33.3 | | | 26.8 | | | 31.6 | | | 21.9 | |
| Approach LOS | | C | | | C | | | C | | | 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 | 28.7 | 9.0 | 4.7 | 16.8 | 5.2 | 32.4 | 8.2 | 13.3 |
| 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 | 37.0 | 17.0 | 4.0 | 16.0 | 5.0 | 49.0 | 6.0 | 14.0 |
| Max Q Clear Time (g_c+I1), s | 22.5 | 4.1 | 2.4 | 3.2 | 2.7 | 2.8 | 5.2 | 8.2 |
| Green Ext Time (p_c), s | 2.1 | 0.4 | 0.0 | 1.1 | 0.0 | 0.6 | 0.0 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.1 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 150 | 50 | 10 | 20 | 50 | 60 | 20 | 680 | 30 | 130 | 780 | 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 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 163 | 54 | 2 | 22 | 54 | 6 | 22 | 739 | 9 | 141 | 848 | 62 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 207 | 362 | 305 | 38 | 184 | 154 | 38 | 1196 | 531 | 180 | 1479 | 658 |
| Arrive On Green | 0.12 | 0.19 | 0.19 | 0.02 | 0.10 | 0.10 | 0.02 | 0.34 | 0.34 | 0.10 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1774 | 1863 | 1571 | 1774 | 1863 | 1559 | 1774 | 3539 | 1572 | 1774 | 3539 | 1574 |
| Grp Volume(v), veh/h | 163 | 54 | 2 | 22 | 54 | 6 | 22 | 739 | 9 | 141 | 848 | 62 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1571 | 1774 | 1863 | 1559 | 1774 | 1770 | 1572 | 1774 | 1770 | 1574 |
| Q Serve(g_s), s | 4.1 | 1.1 | 0.0 | 0.6 | 1.2 | 0.2 | 0.6 | 8.1 | 0.2 | 3.6 | 8.5 | 1.1 |
| Cycle Q Clear(g_c), s | 4.1 | 1.1 | 0.0 | 0.6 | 1.2 | 0.2 | 0.6 | 8.1 | 0.2 | 3.6 | 8.5 | 1.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 207 | 362 | 305 | 38 | 184 | 154 | 38 | 1196 | 531 | 180 | 1479 | 658 |
| V/C Ratio(X) | 0.79 | 0.15 | 0.01 | 0.58 | 0.29 | 0.04 | 0.58 | 0.62 | 0.02 | 0.78 | 0.57 | 0.09 |
| Avail Cap(c_a), veh/h | 268 | 1045 | 881 | 153 | 924 | 774 | 153 | 1374 | 610 | 230 | 1527 | 679 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.9 | 15.5 | 15.1 | 22.5 | 19.4 | 18.9 | 22.5 | 12.8 | 10.2 | 20.3 | 10.3 | 8.2 |
| Incr Delay (d2), s/veh | 11.0 | 0.2 | 0.0 | 13.4 | 0.9 | 0.1 | 13.4 | 0.7 | 0.0 | 12.7 | 0.5 | 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 | 2.7 | 0.6 | 0.0 | 0.4 | 0.7 | 0.1 | 0.4 | 4.0 | 0.1 | 2.4 | 4.2 | 0.5 |
| LnGrp Delay(d),s/veh | 30.9 | 15.7 | 15.1 | 35.9 | 20.3 | 19.0 | 35.9 | 13.5 | 10.2 | 33.1 | 10.8 | 8.2 |
| LnGrp LOS | C | B | B | D | C | B | D | B | B | C | B | A |
| Approach Vol, veh/h | | 219 | | | 82 | | | 770 | | | 1051 | |
| Approach Delay, s/veh | | 27.0 | | | 24.4 | | | 14.1 | | | 13.6 | |
| 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 | 8.7 | 19.7 | 5.0 | 13.0 | 5.0 | 23.4 | 9.4 | 8.6 |
| 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 | 6.0 | 18.0 | 4.0 | 26.0 | 4.0 | 20.0 | 7.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 5.6 | 10.1 | 2.6 | 3.1 | 2.6 | 10.5 | 6.1 | 3.2 |
| Green Ext Time (p_c), s | 0.0 | 5.5 | 0.0 | 0.5 | 0.0 | 6.3 | 0.0 | 0.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 15.6 |
| HCM 2010 LOS | | B |

# HCM 2010 Signalized Intersection Summary
## 30: Street "A" & Street "B"

10/27/2014

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 120 | 80 | 40 | 85 | 85 | 90 | 540 | 40 | 100 | 380 | 50 |
| 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 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 33 | 130 | 48 | 43 | 92 | 33 | 98 | 587 | 40 | 109 | 413 | 47 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 51 | 210 | 78 | 63 | 220 | 79 | 125 | 728 | 50 | 139 | 706 | 80 |
| Arrive On Green | 0.03 | 0.16 | 0.16 | 0.04 | 0.17 | 0.17 | 0.07 | 0.42 | 0.42 | 0.08 | 0.43 | 0.43 |
| Sat Flow, veh/h | 1774 | 1293 | 477 | 1774 | 1304 | 468 | 1774 | 1724 | 117 | 1774 | 1642 | 187 |
| Grp Volume(v), veh/h | 33 | 0 | 178 | 43 | 0 | 125 | 98 | 0 | 627 | 109 | 0 | 460 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1770 | 1774 | 0 | 1772 | 1774 | 0 | 1841 | 1774 | 0 | 1828 |
| Q Serve(g_s), s | 1.0 | 0.0 | 5.0 | 1.3 | 0.0 | 3.4 | 2.9 | 0.0 | 15.8 | 3.2 | 0.0 | 10.2 |
| Cycle Q Clear(g_c), s | 1.0 | 0.0 | 5.0 | 1.3 | 0.0 | 3.4 | 2.9 | 0.0 | 15.8 | 3.2 | 0.0 | 10.2 |
| Prop In Lane | 1.00 | | 0.27 | 1.00 | | 0.26 | 1.00 | | 0.06 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 51 | 0 | 288 | 63 | 0 | 300 | 125 | 0 | 778 | 139 | 0 | 787 |
| V/C Ratio(X) | 0.64 | 0.00 | 0.62 | 0.69 | 0.00 | 0.42 | 0.78 | 0.00 | 0.81 | 0.78 | 0.00 | 0.58 |
| Avail Cap(c_a), veh/h | 133 | 0 | 566 | 133 | 0 | 567 | 200 | 0 | 970 | 167 | 0 | 929 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.5 | 0.0 | 20.7 | 25.3 | 0.0 | 19.7 | 24.3 | 0.0 | 13.4 | 24.1 | 0.0 | 11.5 |
| Incr Delay (d2), s/veh | 12.5 | 0.0 | 2.2 | 12.4 | 0.0 | 0.9 | 10.1 | 0.0 | 4.1 | 18.1 | 0.0 | 0.7 |
| 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 | 0.7 | 0.0 | 2.6 | 0.8 | 0.0 | 1.7 | 1.8 | 0.0 | 8.9 | 2.3 | 0.0 | 5.3 |
| LnGrp Delay(d),s/veh | 38.0 | 0.0 | 22.9 | 37.8 | 0.0 | 20.7 | 34.4 | 0.0 | 17.5 | 42.1 | 0.0 | 12.2 |
| LnGrp LOS | D | | C | D | | C | C | | B | D | | B |
| Approach Vol, veh/h | | 211 | | | 168 | | | 725 | | | 569 | |
| Approach Delay, s/veh | | 25.2 | | | 25.0 | | | 19.8 | | | 17.9 | |
| 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 | 8.2 | 26.5 | 5.9 | 12.6 | 7.8 | 26.9 | 5.5 | 13.0 |
| 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 | 5.0 | 28.0 | 4.0 | 17.0 | 6.0 | 27.0 | 4.0 | 17.0 |
| Max Q Clear Time (g_c+I1), s | 5.2 | 17.8 | 3.3 | 7.0 | 4.9 | 12.2 | 3.0 | 5.4 |
| Green Ext Time (p_c), s | 0.0 | 4.6 | 0.0 | 1.1 | 0.0 | 5.8 | 0.0 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 20.4 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 220 | 10 | 30 | 10 | 10 | 20 | 30 | 1110 | 10 | 40 | 1010 | 160 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 239 | 11 | 7 | 11 | 11 | 0 | 33 | 1207 | 10 | 43 | 1098 | 161 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 288 | 225 | 143 | 20 | 113 | 0 | 49 | 1757 | 15 | 60 | 1531 | 224 |
| Arrive On Green | 0.16 | 0.21 | 0.21 | 0.01 | 0.06 | 0.00 | 0.03 | 0.49 | 0.49 | 0.03 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1774 | 1062 | 676 | 1774 | 1863 | 0 | 1774 | 3597 | 30 | 1774 | 3097 | 453 |
| Grp Volume(v), veh/h | 239 | 0 | 18 | 11 | 11 | 0 | 33 | 594 | 623 | 43 | 626 | 633 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1738 | 1774 | 1863 | 0 | 1774 | 1770 | 1857 | 1774 | 1770 | 1780 |
| Q Serve(g_s), s | 8.2 | 0.0 | 0.5 | 0.4 | 0.4 | 0.0 | 1.2 | 16.2 | 16.2 | 1.5 | 17.4 | 17.5 |
| Cycle Q Clear(g_c), s | 8.2 | 0.0 | 0.5 | 0.4 | 0.4 | 0.0 | 1.2 | 16.2 | 16.2 | 1.5 | 17.4 | 17.5 |
| Prop In Lane | 1.00 | | 0.39 | 1.00 | | 0.00 | 1.00 | | 0.02 | 1.00 | | 0.25 |
| Lane Grp Cap(c), veh/h | 288 | 0 | 368 | 20 | 113 | 0 | 49 | 865 | 907 | 60 | 875 | 880 |
| V/C Ratio(X) | 0.83 | 0.00 | 0.05 | 0.56 | 0.10 | 0.00 | 0.67 | 0.69 | 0.69 | 0.72 | 0.72 | 0.72 |
| Avail Cap(c_a), veh/h | 367 | 0 | 886 | 113 | 682 | 0 | 113 | 958 | 1006 | 113 | 958 | 964 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.4 | 0.0 | 19.7 | 30.9 | 27.9 | 0.0 | 30.2 | 12.4 | 12.4 | 30.0 | 12.4 | 12.5 |
| Incr Delay (d2), s/veh | 11.8 | 0.0 | 0.1 | 22.3 | 0.4 | 0.0 | 14.4 | 1.8 | 1.7 | 15.1 | 2.3 | 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 | 4.9 | 0.0 | 0.3 | 0.3 | 0.2 | 0.0 | 0.8 | 8.2 | 8.6 | 1.0 | 8.9 | 9.0 |
| LnGrp Delay(d),s/veh | 37.3 | 0.0 | 19.8 | 53.2 | 28.3 | 0.0 | 44.6 | 14.2 | 14.1 | 45.1 | 14.8 | 14.8 |
| LnGrp LOS | D | | B | D | C | | D | B | B | D | B | B |
| Approach Vol, veh/h | | 257 | | | 22 | | | 1250 | | | 1302 | |
| Approach Delay, s/veh | | 36.1 | | | 40.7 | | | 14.9 | | | 15.8 | |
| Approach LOS | | D | | | D | | | 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 | 6.1 | 34.7 | 4.7 | 17.3 | 5.8 | 35.0 | 14.2 | 7.8 |
| 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 | 34.0 | 4.0 | 32.0 | 4.0 | 34.0 | 13.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 18.2 | 2.4 | 2.5 | 3.2 | 19.5 | 10.2 | 2.4 |
| Green Ext Time (p_c), s | 0.0 | 12.4 | 0.0 | 0.1 | 0.0 | 11.5 | 0.2 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.5 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 1190 | 320 | 50 | 1040 | 510 | 350 | 630 | 50 | 430 | 610 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 1293 | 123 | 52 | 1130 | 289 | 365 | 656 | 45 | 467 | 635 | 10 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 3 | 1 | 2 | 2 | 0 | 2 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.96 | 0.96 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.92 | 0.96 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 19 | 1323 | 591 | 66 | 2035 | 633 | 443 | 881 | 60 | 482 | 975 | 15 |
| Arrive On Green | 0.01 | 0.37 | 0.37 | 0.04 | 0.40 | 0.40 | 0.13 | 0.26 | 0.26 | 0.14 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1774 | 3539 | 1581 | 1774 | 5085 | 1581 | 3442 | 3361 | 230 | 3442 | 3566 | 56 |
| Grp Volume(v), veh/h | 11 | 1293 | 123 | 52 | 1130 | 289 | 365 | 345 | 356 | 467 | 315 | 330 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1581 | 1774 | 1695 | 1581 | 1721 | 1770 | 1821 | 1721 | 1770 | 1853 |
| Q Serve(g_s), s | 0.5 | 30.9 | 4.5 | 2.5 | 14.7 | 11.5 | 8.8 | 15.3 | 15.3 | 11.6 | 13.5 | 13.5 |
| Cycle Q Clear(g_c), s | 0.5 | 30.9 | 4.5 | 2.5 | 14.7 | 11.5 | 8.8 | 15.3 | 15.3 | 11.6 | 13.5 | 13.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 19 | 1323 | 591 | 66 | 2035 | 633 | 443 | 464 | 477 | 482 | 484 | 507 |
| V/C Ratio(X) | 0.58 | 0.98 | 0.21 | 0.79 | 0.56 | 0.46 | 0.82 | 0.74 | 0.75 | 0.97 | 0.65 | 0.65 |
| Avail Cap(c_a), veh/h | 83 | 1323 | 591 | 83 | 2035 | 633 | 482 | 537 | 553 | 482 | 537 | 563 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.2 | 26.5 | 18.2 | 40.9 | 19.8 | 18.8 | 36.4 | 29.0 | 29.0 | 36.6 | 27.5 | 27.5 |
| Incr Delay (d2), s/veh | 24.6 | 19.5 | 0.2 | 31.6 | 0.3 | 0.5 | 10.4 | 4.8 | 4.7 | 32.8 | 2.4 | 2.3 |
| 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 | 0.4 | 18.7 | 2.0 | 1.8 | 6.9 | 5.1 | 4.8 | 8.1 | 8.3 | 7.6 | 6.9 | 7.2 |
| LnGrp Delay(d),s/veh | 66.7 | 45.9 | 18.4 | 72.5 | 20.1 | 19.4 | 46.7 | 33.7 | 33.7 | 69.4 | 29.9 | 29.8 |
| LnGrp LOS | E | D | B | E | C | B | D | C | C | E | C | C |
| Approach Vol, veh/h | | 1427 | | | 1471 | | | 1066 | | | 1112 | |
| Approach Delay, s/veh | | 43.7 | | | 21.8 | | | 38.2 | | | 46.5 | |
| Approach LOS | | D | | | C | | | D | | | 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 | 16.0 | 26.4 | 7.2 | 36.0 | 15.0 | 27.4 | 4.9 | 38.3 |
| 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 | 12.0 | 26.0 | 4.0 | 32.0 | 12.0 | 26.0 | 4.0 | 32.0 |
| Max Q Clear Time (g_c+I1), s | 13.6 | 17.3 | 4.5 | 32.9 | 10.8 | 15.5 | 2.5 | 16.7 |
| Green Ext Time (p_c), s | 0.0 | 4.9 | 0.0 | 0.0 | 0.2 | 5.6 | 0.0 | 12.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 36.8 |
| HCM 2010 LOS | D |

# Cumulative Plus Project Conditions

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 80 | 60 | 310 | 340 | 240 | 20 | 1520 | 190 | 280 | 1460 | 10 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 22 | 87 | 0 | 337 | 370 | 0 | 22 | 1652 | 0 | 304 | 1587 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 192 | 367 | 114 | 413 | 693 | 216 | 42 | 2436 | 758 | 388 | 2947 | 918 |
| Arrive On Green | 0.06 | 0.07 | 0.00 | 0.12 | 0.14 | 0.00 | 0.01 | 0.48 | 0.00 | 0.11 | 0.58 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 22 | 87 | 0 | 337 | 370 | 0 | 22 | 1652 | 0 | 304 | 1587 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 0.6 | 1.5 | 0.0 | 8.7 | 6.1 | 0.0 | 0.6 | 22.7 | 0.0 | 7.8 | 17.3 | 0.0 |
| Cycle Q Clear(g_c), s | 0.6 | 1.5 | 0.0 | 8.7 | 6.1 | 0.0 | 0.6 | 22.7 | 0.0 | 7.8 | 17.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 192 | 367 | 114 | 413 | 693 | 216 | 42 | 2436 | 758 | 388 | 2947 | 918 |
| V/C Ratio(X) | 0.11 | 0.24 | 0.00 | 0.82 | 0.53 | 0.00 | 0.52 | 0.68 | 0.00 | 0.78 | 0.54 | 0.00 |
| Avail Cap(c_a), veh/h | 192 | 1740 | 542 | 513 | 2307 | 718 | 129 | 2436 | 758 | 475 | 2947 | 918 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 40.7 | 39.7 | 0.0 | 38.9 | 36.4 | 0.0 | 44.5 | 18.2 | 0.0 | 39.1 | 11.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.6 | 0.0 | 6.7 | 1.1 | 0.0 | 3.7 | 1.5 | 0.0 | 5.4 | 0.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.7 | 0.0 | 4.5 | 2.9 | 0.0 | 0.3 | 10.9 | 0.0 | 4.0 | 8.1 | 0.0 |
| LnGrp Delay(d),s/veh | 40.7 | 40.2 | 0.0 | 45.6 | 37.5 | 0.0 | 48.2 | 19.8 | 0.0 | 44.5 | 12.4 | 0.0 |
| LnGrp LOS | D | D | | D | D | | D | B | | D | B | |
| Approach Vol, veh/h | | 109 | | | 707 | | | 1674 | | | 1891 | |
| Approach Delay, s/veh | | 40.3 | | | 41.4 | | | 20.1 | | | 17.5 | |
| Approach LOS | | D | | | D | | | 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 | 44.1 | 48.7 | 9.5 | 17.6 | 35.0 | 57.8 | 15.4 | 11.8 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 12.5 | 43.4 | 3.4 | 41.1 | 3.4 | 52.5 | 13.5 | 31.0 |
| Max Q Clear Time (g_c+I1), s | 9.8 | 24.7 | 2.6 | 8.1 | 2.6 | 19.3 | 10.7 | 3.5 |
| Green Ext Time (p_c), s | 0.1 | 16.6 | 0.1 | 4.0 | 0.0 | 27.0 | 0.2 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 22.9 |
| HCM 2010 LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 20 | 180 | 60 | 40 | 20 | 290 | 690 | 10 | 30 | 850 | 270 |
| 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 98 | 22 | 63 | 65 | 43 | 13 | 315 | 750 | 9 | 33 | 924 | 208 |
| Adj No. of Lanes | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 205 | 423 | 358 | 0 | 119 | 36 | 377 | 2604 | 31 | 52 | 1328 | 298 |
| Arrive On Green | 0.06 | 0.23 | 0.23 | 0.00 | 0.09 | 0.09 | 0.21 | 0.50 | 0.50 | 0.03 | 0.32 | 0.32 |
| Sat Flow, veh/h | 3442 | 1863 | 1579 | 0 | 1370 | 414 | 1774 | 5179 | 62 | 1774 | 4154 | 932 |
| Grp Volume(v), veh/h | 98 | 22 | 63 | 0 | 0 | 56 | 315 | 491 | 268 | 33 | 754 | 378 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1579 | 0 | 0 | 1785 | 1774 | 1695 | 1851 | 1774 | 1695 | 1695 |
| Q Serve(g_s), s | 1.4 | 0.5 | 1.6 | 0.0 | 0.0 | 1.5 | 8.5 | 4.2 | 4.2 | 0.9 | 9.7 | 9.7 |
| Cycle Q Clear(g_c), s | 1.4 | 0.5 | 1.6 | 0.0 | 0.0 | 1.5 | 8.5 | 4.2 | 4.2 | 0.9 | 9.7 | 9.7 |
| Prop In Lane | 1.00 | | 1.00 | 0.00 | | 0.23 | 1.00 | | 0.03 | 1.00 | | 0.55 |
| Lane Grp Cap(c), veh/h | 205 | 423 | 358 | 0 | 0 | 155 | 377 | 1704 | 931 | 52 | 1084 | 542 |
| V/C Ratio(X) | 0.48 | 0.05 | 0.18 | 0.00 | 0.00 | 0.36 | 0.84 | 0.29 | 0.29 | 0.63 | 0.70 | 0.70 |
| Avail Cap(c_a), veh/h | 276 | 748 | 634 | 0 | 0 | 717 | 463 | 1704 | 931 | 178 | 1157 | 579 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.7 | 15.1 | 15.5 | 0.0 | 0.0 | 21.4 | 18.8 | 7.2 | 7.2 | 23.9 | 14.8 | 14.8 |
| Incr Delay (d2), s/veh | 1.7 | 0.1 | 0.2 | 0.0 | 0.0 | 1.4 | 10.6 | 0.1 | 0.2 | 11.9 | 1.7 | 3.4 |
| 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 | 0.2 | 0.7 | 0.0 | 0.0 | 0.8 | 5.2 | 1.9 | 2.1 | 0.6 | 4.8 | 5.0 |
| LnGrp Delay(d),s/veh | 24.4 | 15.1 | 15.7 | 0.0 | 0.0 | 22.8 | 29.4 | 7.3 | 7.4 | 35.8 | 16.5 | 18.3 |
| LnGrp LOS | C | B | B | | | C | C | A | A | D | B | B |
| Approach Vol, veh/h | | 183 | | | 56 | | | 1074 | | | 1165 | |
| Approach Delay, s/veh | | 20.3 | | | 22.8 | | | 13.8 | | | 17.6 | |
| 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 | 5.5 | 29.0 | 0.0 | 15.3 | 14.6 | 19.9 | 7.0 | 8.3 |
| 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 | 5.0 | 25.0 | 4.0 | 20.0 | 13.0 | 17.0 | 4.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 6.2 | 0.0 | 3.6 | 10.5 | 11.7 | 3.4 | 3.5 |
| Green Ext Time (p_c), s | 0.0 | 11.3 | 0.0 | 0.4 | 0.2 | 4.1 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 550 | 190 | 90 | 600 | 30 | 90 | 10 | 10 | 60 | 50 | 350 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 129 | 591 | 73 | 97 | 645 | 0 | 105 | 0 | 0 | 65 | 54 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 0 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 222 | 2113 | 657 | 174 | 2041 | 636 | 228 | 0 | 102 | 235 | 127 | 108 |
| Arrive On Green | 0.06 | 0.42 | 0.42 | 0.05 | 0.40 | 0.00 | 0.06 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1581 | 3442 | 5085 | 1583 | 3548 | 0 | 1583 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 129 | 591 | 73 | 97 | 645 | 0 | 105 | 0 | 0 | 65 | 54 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1581 | 1721 | 1695 | 1583 | 1774 | 0 | 1583 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 1.7 | 3.6 | 1.3 | 1.3 | 4.1 | 0.0 | 1.4 | 0.0 | 0.0 | 0.8 | 1.3 | 0.0 |
| Cycle Q Clear(g_c), s | 1.7 | 3.6 | 1.3 | 1.3 | 4.1 | 0.0 | 1.4 | 0.0 | 0.0 | 0.8 | 1.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 222 | 2113 | 657 | 174 | 2041 | 636 | 228 | 0 | 102 | 235 | 127 | 108 |
| V/C Ratio(X) | 0.58 | 0.28 | 0.11 | 0.56 | 0.32 | 0.00 | 0.46 | 0.00 | 0.00 | 0.28 | 0.42 | 0.00 |
| Avail Cap(c_a), veh/h | 356 | 2545 | 791 | 385 | 2588 | 806 | 2473 | 0 | 1103 | 2471 | 1338 | 1137 |
| 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 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 21.5 | 9.2 | 8.5 | 22.0 | 9.7 | 0.0 | 21.4 | 0.0 | 0.0 | 20.9 | 21.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.2 | 0.2 | 1.0 | 0.2 | 0.0 | 0.5 | 0.0 | 0.0 | 0.2 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 1.7 | 0.6 | 0.6 | 2.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.4 | 0.7 | 0.0 |
| LnGrp Delay(d),s/veh | 22.4 | 9.3 | 8.7 | 23.0 | 9.9 | 0.0 | 21.9 | 0.0 | 0.0 | 21.2 | 22.0 | 0.0 |
| LnGrp LOS | C | A | A | C | A | | C | | | C | C | |
| Approach Vol, veh/h | | 793 | | | 742 | | | 105 | | | 119 | |
| Approach Delay, s/veh | | 11.4 | | | 11.6 | | | 21.9 | | | 21.6 | |
| 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 | 6.9 | 25.2 | | 7.5 | 7.6 | 24.5 | | 7.7 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 5.3 | 23.7 | | 33.0 | 4.9 | 24.1 | | 34.0 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 5.6 | | 3.4 | 3.7 | 6.1 | | 3.3 |
| Green Ext Time (p_c), s | 0.0 | 12.8 | | 0.2 | 0.0 | 12.8 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.8 |
| HCM 2010 LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 190 | 310 | 530 | 490 | 520 | 730 | 1200 | 220 | 290 | 1210 | 60 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 95 | 200 | 25 | 558 | 516 | 0 | 768 | 1263 | 0 | 305 | 1274 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 148 | 602 | 188 | 608 | 1274 | 397 | 806 | 2153 | 670 | 369 | 1471 | 458 |
| Arrive On Green | 0.04 | 0.12 | 0.12 | 0.17 | 0.25 | 0.00 | 0.08 | 0.14 | 0.00 | 0.11 | 0.29 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 95 | 200 | 25 | 558 | 516 | 0 | 768 | 1263 | 0 | 305 | 1274 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 3.0 | 4.0 | 1.6 | 17.6 | 9.4 | 0.0 | 24.8 | 25.9 | 0.0 | 9.7 | 26.5 | 0.0 |
| Cycle Q Clear(g_c), s | 3.0 | 4.0 | 1.6 | 17.6 | 9.4 | 0.0 | 24.8 | 25.9 | 0.0 | 9.7 | 26.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 148 | 602 | 188 | 608 | 1274 | 397 | 806 | 2153 | 670 | 369 | 1471 | 458 |
| V/C Ratio(X) | 0.64 | 0.33 | 0.13 | 0.92 | 0.41 | 0.00 | 0.95 | 0.59 | 0.00 | 0.83 | 0.87 | 0.00 |
| Avail Cap(c_a), veh/h | 222 | 958 | 298 | 608 | 1520 | 473 | 806 | 2153 | 670 | 525 | 1506 | 469 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.70 | 0.70 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 52.5 | 45.1 | 44.0 | 45.2 | 34.8 | 0.0 | 50.8 | 38.8 | 0.0 | 48.7 | 37.6 | 0.0 |
| Incr Delay (d2), s/veh | 1.7 | 0.8 | 0.8 | 18.5 | 0.6 | 0.0 | 16.3 | 0.8 | 0.0 | 5.0 | 6.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 1.9 | 0.7 | 10.0 | 4.5 | 0.0 | 13.7 | 12.4 | 0.0 | 4.9 | 13.2 | 0.0 |
| LnGrp Delay(d),s/veh | 54.2 | 45.9 | 44.8 | 63.7 | 35.4 | 0.0 | 67.1 | 39.6 | 0.0 | 53.7 | 43.6 | 0.0 |
| LnGrp LOS | D | D | D | E | D | | E | D | | D | D | |
| Approach Vol, veh/h | | 320 | | | 1074 | | | 2031 | | | 1579 | |
| Approach Delay, s/veh | | 48.3 | | | 50.1 | | | 50.0 | | | 45.6 | |
| Approach LOS | | D | | | D | | | D | | | 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 | 16.5 | 61.0 | 9.3 | 33.2 | 31.4 | 46.1 | 24.0 | 18.5 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 5.3 | * 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 17.0 | 42.9 | 7.2 | 33.3 | 26.1 | * 33 | 19.5 | 21.0 |
| Max Q Clear Time (g_c+I1), s | 11.7 | 27.9 | 5.0 | 11.4 | 26.8 | 28.5 | 19.6 | 6.0 |
| Green Ext Time (p_c), s | 0.3 | 12.1 | 0.0 | 9.0 | 0.0 | 3.8 | 0.0 | 7.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 48.5 |
| HCM 2010 LOS | D |

**Notes**

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 90 | 460 | 370 | 110 | 760 | 250 | 970 | 570 | 60 | 300 | 780 | 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 | | 0.98 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 94 | 479 | 277 | 115 | 792 | 236 | 1010 | 594 | 18 | 312 | 812 | 14 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 68 | 518 | 298 | 94 | 680 | 203 | 723 | 1643 | 511 | 464 | 900 | 279 |
| Arrive On Green | 0.04 | 0.24 | 0.24 | 0.05 | 0.25 | 0.25 | 0.41 | 0.32 | 0.32 | 0.26 | 0.18 | 0.18 |
| Sat Flow, veh/h | 1774 | 2164 | 1245 | 1774 | 2678 | 798 | 1774 | 5085 | 1580 | 1774 | 5085 | 1578 |
| Grp Volume(v), veh/h | 94 | 391 | 365 | 115 | 523 | 505 | 1010 | 594 | 18 | 312 | 812 | 14 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1639 | 1774 | 1770 | 1707 | 1774 | 1695 | 1580 | 1774 | 1695 | 1578 |
| Q Serve(g_s), s | 5.0 | 28.1 | 28.3 | 6.9 | 33.0 | 33.0 | 53.0 | 11.6 | 0.8 | 20.5 | 20.3 | 1.0 |
| Cycle Q Clear(g_c), s | 5.0 | 28.1 | 28.3 | 6.9 | 33.0 | 33.0 | 53.0 | 11.6 | 0.8 | 20.5 | 20.3 | 1.0 |
| Prop In Lane | 1.00 | | 0.76 | 1.00 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 68 | 424 | 393 | 94 | 449 | 433 | 723 | 1643 | 511 | 464 | 900 | 279 |
| V/C Ratio(X) | 1.38 | 0.92 | 0.93 | 1.23 | 1.16 | 1.17 | 1.40 | 0.36 | 0.04 | 0.67 | 0.90 | 0.05 |
| Avail Cap(c_a), veh/h | 68 | 436 | 404 | 94 | 449 | 433 | 723 | 1643 | 511 | 464 | 900 | 279 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 62.5 | 48.3 | 48.4 | 61.6 | 48.5 | 48.5 | 38.5 | 33.7 | 20.8 | 43.0 | 52.4 | 44.4 |
| Incr Delay (d2), s/veh | 238.5 | 25.0 | 27.4 | 166.0 | 96.0 | 96.8 | 186.8 | 0.6 | 0.1 | 7.6 | 14.0 | 0.3 |
| 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 | 7.0 | 16.6 | 15.8 | 7.7 | 28.1 | 27.2 | 63.4 | 5.5 | 0.5 | 11.0 | 10.7 | 0.4 |
| LnGrp Delay(d),s/veh | 301.0 | 73.2 | 75.8 | 227.5 | 144.5 | 145.3 | 225.3 | 34.3 | 20.9 | 50.6 | 66.4 | 44.8 |
| LnGrp LOS | F | E | E | F | F | F | F | C | C | D | E | D |
| Approach Vol, veh/h | | 850 | | | 1143 | | | 1622 | | | 1138 | |
| Approach Delay, s/veh | | 99.5 | | | 153.2 | | | 153.1 | | | 61.8 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| 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 | 38.0 | 46.0 | 10.9 | 35.1 | 57.0 | 27.0 | 9.0 | 37.0 |
| 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 | 34.0 | 42.0 | 6.0 | 32.0 | 53.0 | 23.0 | 5.0 | 33.0 |
| Max Q Clear Time (g_c+I1), s | 22.5 | 13.6 | 8.9 | 30.3 | 55.0 | 22.3 | 7.0 | 35.0 |
| Green Ext Time (p_c), s | 0.7 | 10.7 | 0.0 | 0.8 | 0.0 | 0.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 121.7 |
| HCM 2010 LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 2070 | 160 | 200 | 1110 | 780 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.96 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4633 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4633 | 1362 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 2226 | 172 | 215 | 1194 | 839 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 43 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 2226 | 129 | 215 | 1572 | 461 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 21.7 | | 77.7 | 77.7 | 21.7 | 120.0 | 120.0 |
| Effective Green, g (s) | | | | | | 21.7 | | 77.7 | 77.7 | 21.7 | 120.0 | 120.0 |
| Actuated g/C Ratio | | | | | | 0.18 | | 0.65 | 0.65 | 0.18 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 291 | | 3292 | 1024 | 320 | 4633 | 1362 |
| v/s Ratio Prot | | | | | | 0.02 | | c0.44 | | c0.12 | 0.34 | |
| v/s Ratio Perm | | | | | | | | | 0.08 | | | 0.34 |
| v/c Ratio | | | | | | 0.10 | | 0.68 | 0.13 | 0.67 | 0.34 | 0.34 |
| Uniform Delay, d1 | | | | | | 41.0 | | 13.3 | 8.1 | 45.8 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 0.88 | 1.00 | 1.21 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 0.1 | | 0.7 | 0.1 | 2.3 | 0.1 | 0.4 |
| Delay (s) | | | | | | 41.1 | | 12.4 | 8.2 | 58.0 | 0.1 | 0.4 |
| Level of Service | | | | | | D | | B | A | E | A | A |
| Approach Delay (s) | | 0.0 | | | 41.1 | | | 12.1 | | | 5.7 | |
| Approach LOS | | A | | | D | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 59.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 410 | 450 | 1780 | 260 | 0 | 1110 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 441 | 481 | 1914 | 0 | 0 | 1194 |
| Adj No. of Lanes | 2 | 2 | 3 | 1 | 0 | 3 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 820 | 664 | 2841 | 885 | 0 | 2841 |
| Arrive On Green | 0.24 | 0.24 | 0.56 | 0.00 | 0.00 | 0.56 |
| Sat Flow, veh/h | 3442 | 2787 | 5253 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 441 | 481 | 1914 | 0 | 0 | 1194 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1695 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 5.3 | 7.5 | 12.6 | 0.0 | 0.0 | 6.4 |
| Cycle Q Clear(g_c), s | 5.3 | 7.5 | 12.6 | 0.0 | 0.0 | 6.4 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 820 | 664 | 2841 | 885 | 0 | 2841 |
| V/C Ratio(X) | 0.54 | 0.72 | 0.67 | 0.00 | 0.00 | 0.42 |
| Avail Cap(c_a), veh/h | 1748 | 1415 | 2841 | 885 | 0 | 2841 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.76 | 0.00 | 0.00 | 0.95 |
| Uniform Delay (d), s/veh | 15.7 | 16.6 | 7.4 | 0.0 | 0.0 | 6.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.6 | 1.0 | 0.0 | 0.0 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 2.9 | 5.9 | 0.0 | 0.0 | 3.1 |
| LnGrp Delay(d),s/veh | 15.9 | 17.1 | 8.4 | 0.0 | 0.0 | 6.4 |
| LnGrp LOS | B | B | A | | | A |
| Approach Vol, veh/h | 922 | | 1914 | | | 1194 |
| Approach Delay, s/veh | 16.6 | | 8.4 | | | 6.4 |
| 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 | | 44.4 | | | | 44.4 | | 15.6 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 26.4 | | | | 26.4 | | 24.0 |
| Max Q Clear Time (g_c+I1), s | | 14.6 | | | | 8.4 | | 9.5 |
| Green Ext Time (p_c), s | | 9.7 | | | | 13.8 | | 1.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 9.7 |
| HCM 2010 LOS | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 750 | 0 | 670 | 0 | 0 | 0 | 0 | 1290 | 470 | 0 | 1400 | 120 |
| 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 | 815 | 0 | 698 | | | | 0 | 1402 | 0 | 0 | 1522 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1117 | 0 | 904 | | | | 0 | 2465 | 767 | 0 | 2465 | 767 |
| Arrive On Green | 0.32 | 0.00 | 0.32 | | | | 0.00 | 0.48 | 0.00 | 0.00 | 0.16 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 815 | 0 | 698 | | | | 0 | 1402 | 0 | 0 | 1522 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 10.5 | 0.0 | 11.4 | | | | 0.0 | 9.9 | 0.0 | 0.0 | 14.0 | 0.0 |
| Cycle Q Clear(g_c), s | 10.5 | 0.0 | 11.4 | | | | 0.0 | 9.9 | 0.0 | 0.0 | 14.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1117 | 0 | 904 | | | | 0 | 2465 | 767 | 0 | 2465 | 767 |
| V/C Ratio(X) | 0.73 | 0.00 | 0.77 | | | | 0.00 | 0.57 | 0.00 | 0.00 | 0.62 | 0.00 |
| Avail Cap(c_a), veh/h | 1778 | 0 | 1439 | | | | 0 | 2465 | 767 | 0 | 2465 | 767 |
| 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 | 15.0 | 0.0 | 15.3 | | | | 0.0 | 9.2 | 0.0 | 0.0 | 16.8 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 0.5 | | | | 0.0 | 1.0 | 0.0 | 0.0 | 1.1 | 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 | 5.0 | 0.0 | 4.4 | | | | 0.0 | 4.8 | 0.0 | 0.0 | 6.8 | 0.0 |
| LnGrp Delay(d),s/veh | 15.4 | 0.0 | 15.9 | | | | 0.0 | 10.2 | 0.0 | 0.0 | 17.9 | 0.0 |
| LnGrp LOS | B | | B | | | | | B | | | B | |
| Approach Vol, veh/h | | 1513 | | | | | | 1402 | | | 1522 | |
| Approach Delay, s/veh | | 15.6 | | | | | | 10.2 | | | 17.9 | |
| Approach LOS | | B | | | | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 39.4 | | 20.6 | | 39.4 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 24.4 | | * 26 | | 24.4 | | |
| Max Q Clear Time (g_c+I1), s | | 11.9 | | 13.4 | | 16.0 | | |
| Green Ext Time (p_c), s | | 9.8 | | 3.0 | | 6.9 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 14.7 |
| HCM 2010 LOS | | | B |

Notes

User approved pedestrian interval to be less than phase max green.

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 200 | 40 | 710 | 50 | 80 | 150 | 280 | 910 | 110 | 150 | 1320 | 570 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 215 | 211 | 370 | 48 | 94 | 5 | 301 | 978 | 102 | 161 | 1419 | 270 |
| Adj No. of Lanes | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 240 | 236 | 415 | 186 | 368 | 19 | 314 | 1570 | 163 | 195 | 1904 | 540 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.10 | 0.10 | 0.10 | 0.09 | 0.34 | 0.34 | 0.11 | 0.34 | 0.34 |
| Sat Flow, veh/h | 917 | 900 | 1583 | 1774 | 3508 | 185 | 3442 | 4679 | 487 | 1774 | 5588 | 1583 |
| Grp Volume(v), veh/h | 426 | 0 | 370 | 48 | 50 | 49 | 301 | 708 | 372 | 161 | 1419 | 270 |
| Grp Sat Flow(s),veh/h/ln | 1817 | 0 | 1583 | 1774 | 1863 | 1830 | 1721 | 1695 | 1775 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 21.6 | 0.0 | 21.5 | 2.4 | 2.3 | 2.4 | 8.3 | 16.7 | 16.8 | 8.5 | 21.4 | 12.9 |
| Cycle Q Clear(g_c), s | 21.6 | 0.0 | 21.5 | 2.4 | 2.3 | 2.4 | 8.3 | 16.7 | 16.8 | 8.5 | 21.4 | 12.9 |
| Prop In Lane | 0.50 | | 1.00 | 1.00 | | 0.10 | 1.00 | | 0.27 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 476 | 0 | 415 | 186 | 195 | 192 | 314 | 1138 | 596 | 195 | 1904 | 540 |
| V/C Ratio(X) | 0.90 | 0.00 | 0.89 | 0.26 | 0.25 | 0.26 | 0.96 | 0.62 | 0.62 | 0.82 | 0.75 | 0.50 |
| Avail Cap(c_a), veh/h | 564 | 0 | 491 | 186 | 195 | 192 | 314 | 1138 | 596 | 223 | 1904 | 540 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.9 | 0.0 | 33.9 | 39.3 | 39.3 | 39.3 | 43.2 | 26.6 | 26.6 | 41.5 | 27.8 | 25.0 |
| Incr Delay (d2), s/veh | 13.8 | 0.0 | 15.0 | 0.3 | 0.3 | 0.3 | 39.4 | 2.6 | 4.9 | 17.3 | 2.7 | 3.3 |
| 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 | 12.6 | 0.0 | 11.1 | 1.2 | 1.2 | 1.2 | 5.6 | 8.2 | 9.0 | 5.1 | 11.4 | 6.1 |
| LnGrp Delay(d),s/veh | 47.7 | 0.0 | 48.9 | 39.5 | 39.5 | 39.5 | 82.6 | 29.2 | 31.5 | 58.9 | 30.5 | 28.3 |
| LnGrp LOS | D | | D | D | D | D | F | C | C | E | C | C |
| Approach Vol, veh/h | | 796 | | | 147 | | | 1381 | | | 1850 | |
| Approach Delay, s/veh | | 48.3 | | | 39.5 | | | 41.5 | | | 32.6 | |
| 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 | 14.5 | 41.9 | | 29.6 | 18.6 | 37.8 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 5.3 | * 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 12.0 | 30.5 | | 29.6 | 8.7 | * 33 | | 10.0 |
| Max Q Clear Time (g_c+I1), s | 10.5 | 18.8 | | 23.6 | 10.3 | 23.4 | | 4.4 |
| Green Ext Time (p_c), s | 0.0 | 5.5 | | 1.4 | 0.0 | 4.7 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 38.8 |
| HCM 2010 LOS | D |

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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 590 | 0 | 0 | 230 | 0 | 1070 | 470 | 110 | 1970 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1549 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1549 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 634 | 0 | 0 | 247 | 0 | 1151 | 505 | 118 | 2118 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 134 | 0 | 0 | 0 | 0 | 0 | 203 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 500 | 0 | 0 | 247 | 0 | 1151 | 302 | 118 | 2118 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 5 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 13.4 | | | 50.0 | | 29.9 | 29.9 | 10.4 | 26.3 | |
| Effective Green, g (s) | | | 13.4 | | | 50.0 | | 29.9 | 29.9 | 10.4 | 26.3 | |
| Actuated g/C Ratio | | | 0.27 | | | 1.00 | | 0.60 | 0.60 | 0.21 | 0.53 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 746 | | | 1591 | | 3040 | 926 | 368 | 3370 | |
| v/s Ratio Prot | | | c0.18 | | | | | 0.23 | | 0.07 | c0.33 | |
| v/s Ratio Perm | | | | | | 0.16 | | | 0.19 | | | |
| v/c Ratio | | | 0.67 | | | 0.16 | | 0.38 | 0.33 | 0.32 | 0.63 | |
| Uniform Delay, d1 | | | 16.3 | | | 0.0 | | 5.2 | 5.0 | 16.8 | 8.4 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.62 | 0.46 | |
| Incremental Delay, d2 | | | 1.9 | | | 0.2 | | 0.4 | 0.9 | 0.1 | 0.3 | |
| Delay (s) | | | 18.2 | | | 0.2 | | 5.6 | 6.0 | 10.6 | 4.1 | |
| Level of Service | | | B | | | A | | A | A | B | A | |
| Approach Delay (s) | | 18.2 | | | 0.2 | | | 5.7 | | | 4.5 | |
| Approach LOS | | B | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 6.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 57.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 570 | 840 | 0 | 0 | 940 | 50 | 10 | 20 | 10 | 140 | 0 | 390 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 594 | 875 | 0 | 0 | 979 | 13 | 10 | 21 | 1 | 146 | 0 | 47 |
| Adj No. of Lanes | 2 | 2 | 1 | 1 | 3 | 1 | 0 | 2 | 1 | 2 | 0 | 2 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 744 | 2197 | 983 | 3 | 1699 | 528 | 83 | 191 | 120 | 324 | 0 | 288 |
| Arrive On Green | 0.22 | 0.62 | 0.00 | 0.00 | 0.33 | 0.33 | 0.08 | 0.08 | 0.08 | 0.09 | 0.00 | 0.09 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 1774 | 5085 | 1580 | 1089 | 2489 | 1571 | 3548 | 0 | 3146 |
| Grp Volume(v), veh/h | 594 | 875 | 0 | 0 | 979 | 13 | 17 | 14 | 1 | 146 | 0 | 47 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1774 | 1695 | 1580 | 1808 | 1770 | 1571 | 1774 | 0 | 1573 |
| Q Serve(g_s), s | 9.3 | 7.1 | 0.0 | 0.0 | 9.0 | 0.3 | 0.5 | 0.4 | 0.0 | 2.2 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | 9.3 | 7.1 | 0.0 | 0.0 | 9.0 | 0.3 | 0.5 | 0.4 | 0.0 | 2.2 | 0.0 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.60 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 744 | 2197 | 983 | 3 | 1699 | 528 | 138 | 136 | 120 | 324 | 0 | 288 |
| V/C Ratio(X) | 0.80 | 0.40 | 0.00 | 0.00 | 0.58 | 0.02 | 0.12 | 0.11 | 0.01 | 0.45 | 0.00 | 0.16 |
| Avail Cap(c_a), veh/h | 969 | 2197 | 983 | 125 | 2059 | 640 | 828 | 810 | 719 | 1811 | 0 | 1606 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.1 | 5.4 | 0.0 | 0.0 | 15.6 | 12.7 | 24.4 | 24.4 | 24.2 | 24.5 | 0.0 | 23.8 |
| Incr Delay (d2), s/veh | 3.6 | 0.1 | 0.0 | 0.0 | 0.3 | 0.0 | 0.4 | 0.3 | 0.0 | 1.0 | 0.0 | 0.3 |
| 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 | 4.7 | 3.4 | 0.0 | 0.0 | 4.2 | 0.1 | 0.3 | 0.2 | 0.0 | 1.1 | 0.0 | 0.3 |
| LnGrp Delay(d),s/veh | 24.7 | 5.5 | 0.0 | 0.0 | 15.9 | 12.7 | 24.8 | 24.8 | 24.3 | 25.4 | 0.0 | 24.1 |
| LnGrp LOS | C | A | | | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 1469 | | | 992 | | | 32 | | | 193 | |
| Approach Delay, s/veh | | 13.3 | | | 15.9 | | | 24.8 | | | 25.1 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | 3 | 4 | | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 8.4 | 0.0 | 39.3 | | 9.2 | 16.3 | 23.0 |
| Change Period (Y+Rc), s | | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Max Green Setting (Gmax), s | | 26.0 | 4.0 | 35.0 | | 29.0 | 16.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | | 2.5 | 0.0 | 9.1 | | 4.2 | 11.3 | 11.0 |
| Green Ext Time (p_c), s | | 0.1 | 0.0 | 13.3 | | 0.6 | 1.0 | 7.8 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 15.2 |
| HCM 2010 LOS | | | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 950 | 10 | 10 | 840 | 490 | 10 | 20 | 10 | 440 | 10 | 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 32 | 1011 | 10 | 11 | 894 | 136 | 11 | 21 | 4 | 468 | 11 | 73 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 3 | 1 | 0 | 1 | 0 | 2 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 51 | 1452 | 14 | 20 | 1968 | 611 | 0 | 136 | 26 | 620 | 74 | 488 |
| Arrive On Green | 0.03 | 0.40 | 0.40 | 0.01 | 0.39 | 0.39 | 0.00 | 0.09 | 0.09 | 0.18 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1774 | 3590 | 36 | 1774 | 5085 | 1579 | 0 | 1520 | 289 | 3442 | 211 | 1401 |
| Grp Volume(v), veh/h | 32 | 498 | 523 | 11 | 894 | 136 | 0 | 0 | 25 | 468 | 0 | 84 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1856 | 1774 | 1695 | 1579 | 0 | 0 | 1809 | 1721 | 0 | 1613 |
| Q Serve(g_s), s | 0.9 | 11.9 | 11.9 | 0.3 | 6.6 | 2.9 | 0.0 | 0.0 | 0.6 | 6.6 | 0.0 | 1.8 |
| Cycle Q Clear(g_c), s | 0.9 | 11.9 | 11.9 | 0.3 | 6.6 | 2.9 | 0.0 | 0.0 | 0.6 | 6.6 | 0.0 | 1.8 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 0.00 | | 0.16 | 1.00 | | 0.87 |
| Lane Grp Cap(c), veh/h | 51 | 716 | 751 | 20 | 1968 | 611 | 0 | 0 | 162 | 620 | 0 | 561 |
| V/C Ratio(X) | 0.63 | 0.70 | 0.70 | 0.55 | 0.45 | 0.22 | 0.00 | 0.00 | 0.15 | 0.76 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | 140 | 801 | 840 | 140 | 2302 | 715 | 0 | 0 | 890 | 813 | 0 | 1047 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.4 | 12.5 | 12.5 | 25.0 | 11.6 | 10.4 | 0.0 | 0.0 | 21.4 | 19.8 | 0.0 | 11.4 |
| Incr Delay (d2), s/veh | 12.2 | 2.3 | 2.2 | 21.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.4 | 2.9 | 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 | 0.6 | 6.1 | 6.4 | 0.3 | 3.1 | 1.3 | 0.0 | 0.0 | 0.3 | 3.4 | 0.0 | 0.8 |
| LnGrp Delay(d),s/veh | 36.6 | 14.9 | 14.7 | 46.2 | 11.7 | 10.6 | 0.0 | 0.0 | 21.8 | 22.7 | 0.0 | 11.5 |
| LnGrp LOS | D | B | B | D | B | B | | | C | C | | B |
| Approach Vol, veh/h | | 1053 | | | 1041 | | | 25 | | | 552 | |
| Approach Delay, s/veh | | 15.5 | | | 12.0 | | | 21.8 | | | 21.0 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 13.1 | 8.5 | 4.6 | 24.5 | 0.0 | 21.7 | 5.5 | 23.7 |
| 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 | 12.0 | 25.0 | 4.0 | 23.0 | 4.0 | 33.0 | 4.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 8.6 | 2.6 | 2.3 | 13.9 | 0.0 | 3.8 | 2.9 | 8.6 |
| Green Ext Time (p_c), s | 0.6 | 0.5 | 0.0 | 6.7 | 0.0 | 0.5 | 0.0 | 9.4 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 15.3 |
| HCM 2010 LOS | | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 560 | 200 | 180 | 390 | 340 | 130 | 50 | 720 | 150 | 120 | 1440 | 450 |
| 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 | | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 609 | 217 | 122 | 424 | 370 | 44 | 54 | 783 | 55 | 130 | 1565 | 207 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 534 | 708 | 328 | 498 | 702 | 312 | 69 | 2635 | 649 | 199 | 2188 | 679 |
| Arrive On Green | 0.16 | 0.21 | 0.21 | 0.14 | 0.20 | 0.20 | 0.04 | 0.41 | 0.41 | 0.06 | 0.43 | 0.43 |
| Sat Flow, veh/h | 3442 | 3390 | 1572 | 3442 | 3539 | 1571 | 1774 | 6408 | 1578 | 3442 | 5085 | 1578 |
| Grp Volume(v), veh/h | 609 | 217 | 122 | 424 | 370 | 44 | 54 | 783 | 55 | 130 | 1565 | 207 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1572 | 1721 | 1770 | 1571 | 1774 | 1602 | 1578 | 1721 | 1695 | 1578 |
| Q Serve(g_s), s | 14.0 | 4.9 | 6.0 | 10.8 | 8.4 | 2.1 | 2.7 | 7.4 | 1.9 | 3.3 | 22.8 | 7.8 |
| Cycle Q Clear(g_c), s | 14.0 | 4.9 | 6.0 | 10.8 | 8.4 | 2.1 | 2.7 | 7.4 | 1.9 | 3.3 | 22.8 | 7.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 534 | 708 | 328 | 498 | 702 | 312 | 69 | 2635 | 649 | 199 | 2188 | 679 |
| V/C Ratio(X) | 1.14 | 0.31 | 0.37 | 0.85 | 0.53 | 0.14 | 0.78 | 0.30 | 0.08 | 0.65 | 0.72 | 0.30 |
| Avail Cap(c_a), veh/h | 534 | 1316 | 610 | 534 | 1374 | 610 | 79 | 2635 | 649 | 305 | 2312 | 717 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.1 | 30.2 | 30.6 | 37.6 | 32.4 | 29.8 | 43.0 | 17.8 | 16.2 | 41.6 | 21.1 | 16.8 |
| Incr Delay (d2), s/veh | 83.6 | 0.2 | 0.7 | 11.9 | 0.6 | 0.2 | 35.4 | 0.1 | 0.1 | 3.6 | 1.0 | 0.3 |
| 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 | 12.8 | 2.3 | 2.7 | 5.9 | 4.2 | 0.9 | 2.0 | 3.3 | 0.8 | 1.7 | 10.8 | 3.4 |
| LnGrp Delay(d),s/veh | 121.7 | 30.4 | 31.3 | 49.5 | 33.0 | 30.0 | 78.3 | 17.9 | 16.2 | 45.2 | 22.2 | 17.1 |
| LnGrp LOS | F | C | C | D | C | C | E | B | B | D | C | B |
| Approach Vol, veh/h | | 948 | | | 838 | | | 892 | | | 1902 | |
| Approach Delay, s/veh | | 89.2 | | | 41.2 | | | 21.4 | | | 23.2 | |
| Approach LOS | | F | | | D | | | C | | | 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 | 9.2 | 41.1 | 17.1 | 22.8 | 7.5 | 42.8 | 18.0 | 21.9 |
| 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 | 8.0 | 37.0 | 14.0 | 35.0 | 4.0 | 41.0 | 14.0 | 35.0 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 9.4 | 12.8 | 8.0 | 4.7 | 24.8 | 16.0 | 10.4 |
| Green Ext Time (p_c), s | 0.1 | 21.4 | 0.2 | 5.2 | 0.0 | 13.7 | 0.0 | 5.1 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 39.8 |
| HCM 2010 LOS | | | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 550 | 120 | 50 | 1400 | 20 | 90 | 10 | 40 | 10 | 10 | 50 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 33 | 598 | 67 | 54 | 1522 | 11 | 106 | 0 | 1 | 11 | 11 | 0 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 39 | 3048 | 949 | 68 | 3129 | 962 | 189 | 0 | 84 | 22 | 23 | 19 |
| Arrive On Green | 0.02 | 0.60 | 0.60 | 0.04 | 0.62 | 0.62 | 0.05 | 0.00 | 0.05 | 0.01 | 0.01 | 0.00 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 33 | 598 | 67 | 54 | 1522 | 11 | 106 | 0 | 1 | 11 | 11 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 1.2 | 3.6 | 1.2 | 2.0 | 11.1 | 0.2 | 2.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.0 |
| Cycle Q Clear(g_c), s | 1.2 | 3.6 | 1.2 | 2.0 | 11.1 | 0.2 | 2.0 | 0.0 | 0.0 | 0.4 | 0.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 39 | 3048 | 949 | 68 | 3129 | 962 | 189 | 0 | 84 | 22 | 23 | 19 |
| V/C Ratio(X) | 0.84 | 0.20 | 0.07 | 0.80 | 0.49 | 0.01 | 0.56 | 0.00 | 0.01 | 0.51 | 0.48 | 0.00 |
| Avail Cap(c_a), veh/h | 95 | 3048 | 949 | 263 | 3352 | 1031 | 2002 | 0 | 893 | 1027 | 1078 | 917 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 32.8 | 6.1 | 5.6 | 32.1 | 7.1 | 5.0 | 31.1 | 0.0 | 30.2 | 33.1 | 33.1 | 0.0 |
| Incr Delay (d2), s/veh | 15.5 | 0.1 | 0.1 | 7.8 | 0.5 | 0.0 | 1.0 | 0.0 | 0.0 | 6.6 | 5.7 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 1.7 | 0.6 | 1.1 | 5.2 | 0.1 | 1.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 |
| LnGrp Delay(d),s/veh | 48.3 | 6.2 | 5.8 | 39.9 | 7.6 | 5.0 | 32.1 | 0.0 | 30.2 | 39.7 | 38.8 | 0.0 |
| LnGrp LOS | D | A | A | D | A | A | C | | C | D | D | |
| Approach Vol, veh/h | | 698 | | | 1587 | | | 107 | | | 22 | |
| Approach Delay, s/veh | | 8.2 | | | 8.7 | | | 32.1 | | | 39.2 | |
| Approach LOS | | A | | | A | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 6.0 | 48.0 | | 5.3 | 7.1 | 46.9 | | 8.1 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 3.6 | 44.4 | | 39.0 | 10.0 | * 38 | | 38.0 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 13.1 | | 2.4 | 4.0 | 5.6 | | 4.0 |
| Green Ext Time (p_c), s | 0.0 | 28.4 | | 0.0 | 0.0 | 30.3 | | 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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 60 | 470 | 70 | 30 | 1260 | 140 | 100 | 10 | 30 | 90 | 20 | 110 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 65 | 511 | 31 | 33 | 1370 | 65 | 109 | 11 | 1 | 98 | 22 | 9 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 100 | 2240 | 697 | 63 | 2134 | 664 | 206 | 111 | 94 | 197 | 69 | 28 |
| Arrive On Green | 0.06 | 0.44 | 0.44 | 0.04 | 0.42 | 0.42 | 0.12 | 0.06 | 0.06 | 0.11 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1258 | 514 |
| Grp Volume(v), veh/h | 65 | 511 | 31 | 33 | 1370 | 65 | 109 | 11 | 1 | 98 | 0 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1772 |
| Q Serve(g_s), s | 2.0 | 3.5 | 0.6 | 1.0 | 12.1 | 1.4 | 3.3 | 0.3 | 0.0 | 2.9 | 0.0 | 1.0 |
| Cycle Q Clear(g_c), s | 2.0 | 3.5 | 0.6 | 1.0 | 12.1 | 1.4 | 3.3 | 0.3 | 0.0 | 2.9 | 0.0 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.29 |
| Lane Grp Cap(c), veh/h | 100 | 2240 | 697 | 63 | 2134 | 664 | 206 | 111 | 94 | 197 | 0 | 97 |
| V/C Ratio(X) | 0.65 | 0.23 | 0.04 | 0.52 | 0.64 | 0.10 | 0.53 | 0.10 | 0.01 | 0.50 | 0.00 | 0.32 |
| Avail Cap(c_a), veh/h | 157 | 2240 | 697 | 188 | 2246 | 699 | 279 | 1218 | 1035 | 251 | 0 | 1130 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.1 | 9.8 | 9.0 | 26.8 | 13.0 | 9.9 | 23.6 | 25.2 | 25.1 | 23.7 | 0.0 | 25.7 |
| Incr Delay (d2), s/veh | 2.6 | 0.1 | 0.1 | 2.4 | 0.9 | 0.1 | 2.1 | 0.4 | 0.0 | 1.9 | 0.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.7 | 0.3 | 0.5 | 5.8 | 0.6 | 1.7 | 0.2 | 0.0 | 1.5 | 0.0 | 0.5 |
| LnGrp Delay(d),s/veh | 28.8 | 10.0 | 9.1 | 29.2 | 13.9 | 10.1 | 25.7 | 25.6 | 25.1 | 25.6 | 0.0 | 27.6 |
| LnGrp LOS | C | A | A | C | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 607 | | | 1468 | | | 121 | | | 129 | |
| Approach Delay, s/veh | | 12.0 | | | 14.1 | | | 25.7 | | | 26.1 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 6.5 | 31.4 | 11.1 | 7.6 | 7.7 | 30.2 | 10.8 | 7.9 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 6.0 | * 24 | 8.9 | 36.1 | 5.0 | 25.0 | 8.0 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 3.0 | 5.5 | 5.3 | 3.0 | 4.0 | 14.1 | 4.9 | 2.3 |
| Green Ext Time (p_c), s | 0.0 | 16.2 | 0.1 | 0.2 | 0.0 | 9.6 | 0.1 | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.8 |
| HCM 2010 LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 460 | 0 | 170 | 0 | 1120 | 330 | 0 | 540 | 1100 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 500 | 0 | 162 | 0 | 1217 | 0 | 0 | 587 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 868 | 0 | 703 | 0 | 1716 | 768 | 0 | 1716 | 768 |
| Arrive On Green | | | | 0.25 | 0.00 | 0.25 | 0.00 | 0.48 | 0.00 | 0.00 | 0.48 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 3632 | 1583 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | | | | 500 | 0 | 162 | 0 | 1217 | 0 | 0 | 587 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1770 | 1583 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | | | | 3.9 | 0.0 | 1.4 | 0.0 | 8.2 | 0.0 | 0.0 | 3.1 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 3.9 | 0.0 | 1.4 | 0.0 | 8.2 | 0.0 | 0.0 | 3.1 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 868 | 0 | 703 | 0 | 1716 | 768 | 0 | 1716 | 768 |
| V/C Ratio(X) | | | | 0.58 | 0.00 | 0.23 | 0.00 | 0.71 | 0.00 | 0.00 | 0.34 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 1809 | 0 | 1464 | 0 | 1860 | 832 | 0 | 1860 | 832 |
| 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 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 10.0 | 0.0 | 9.0 | 0.0 | 6.2 | 0.0 | 0.0 | 4.8 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.6 | 0.0 | 0.2 | 0.0 | 1.2 | 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 | | | | 1.9 | 0.0 | 0.6 | 0.0 | 4.2 | 0.0 | 0.0 | 1.5 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 10.6 | 0.0 | 9.2 | 0.0 | 7.3 | 0.0 | 0.0 | 5.0 | 0.0 |
| LnGrp LOS | | | | B | | A | | A | | | A | |
| Approach Vol, veh/h | | | | | 662 | | | 1217 | | | 587 | |
| Approach Delay, s/veh | | | | | 10.2 | | | 7.3 | | | 5.0 | |
| 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 | | 18.8 | | | | 18.8 | | 11.7 |
| 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 | | 10.2 | | | | 5.1 | | 5.9 |
| Green Ext Time (p_c), s | | 4.5 | | | | 7.7 | | 1.8 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 7.5 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 770 | 0 | 140 | 0 | 0 | 0 | 0 | 680 | 140 | 0 | 860 | 140 |
| 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 | 837 | 0 | 97 | | | | 0 | 739 | 0 | 0 | 935 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1165 | 0 | 943 | | | | 0 | 1493 | 668 | 0 | 1493 | 668 |
| Arrive On Green | 0.34 | 0.00 | 0.34 | | | | 0.00 | 0.42 | 0.00 | 0.00 | 0.42 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 3632 | 1583 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | 837 | 0 | 97 | | | | 0 | 739 | 0 | 0 | 935 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1770 | 1583 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | 7.1 | 0.0 | 0.8 | | | | 0.0 | 5.1 | 0.0 | 0.0 | 6.9 | 0.0 |
| Cycle Q Clear(g_c), s | 7.1 | 0.0 | 0.8 | | | | 0.0 | 5.1 | 0.0 | 0.0 | 6.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1165 | 0 | 943 | | | | 0 | 1493 | 668 | 0 | 1493 | 668 |
| V/C Ratio(X) | 0.72 | 0.00 | 0.10 | | | | 0.00 | 0.50 | 0.00 | 0.00 | 0.63 | 0.00 |
| Avail Cap(c_a), veh/h | 1651 | 0 | 1337 | | | | 0 | 1698 | 760 | 0 | 1698 | 760 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 9.6 | 0.0 | 7.6 | | | | 0.0 | 7.0 | 0.0 | 0.0 | 7.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 0.0 | | | | 0.0 | 0.3 | 0.0 | 0.0 | 0.6 | 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 |
| %ile BackOfQ(50%),veh/ln | 3.4 | 0.0 | 0.3 | | | | 0.0 | 2.5 | 0.0 | 0.0 | 3.4 | 0.0 |
| LnGrp Delay(d),s/veh | 10.5 | 0.0 | 7.6 | | | | 0.0 | 7.3 | 0.0 | 0.0 | 8.2 | 0.0 |
| LnGrp LOS | B | | A | | | | | A | | | A | |
| Approach Vol, veh/h | | 934 | | | | | | 739 | | | 935 | |
| Approach Delay, s/veh | | 10.2 | | | | | | 7.3 | | | 8.2 | |
| 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 | | 18.1 | | 15.3 | | 18.1 | | |
| 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 | | 7.1 | | 9.1 | | 8.9 | | |
| Green Ext Time (p_c), s | | 6.2 | | 2.2 | | 5.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 8.7 |
| HCM 2010 LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 400 | 0 | 1060 | 0 | 540 | 340 | 0 | 1070 | 190 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 435 | 0 | 1039 | 0 | 587 | 0 | 0 | 1163 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 1582 | 0 | 1281 | 0 | 2015 | 627 | 0 | 2015 | 627 |
| Arrive On Green | | | | 0.46 | 0.00 | 0.46 | 0.00 | 0.79 | 0.00 | 0.00 | 0.40 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | | | | 435 | 0 | 1039 | 0 | 587 | 0 | 0 | 1163 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | | | | 4.3 | 0.0 | 17.8 | 0.0 | 1.7 | 0.0 | 0.0 | 9.9 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 4.3 | 0.0 | 17.8 | 0.0 | 1.7 | 0.0 | 0.0 | 9.9 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 1582 | 0 | 1281 | 0 | 2015 | 627 | 0 | 2015 | 627 |
| V/C Ratio(X) | | | | 0.27 | 0.00 | 0.81 | 0.00 | 0.29 | 0.00 | 0.00 | 0.58 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 2169 | 0 | 1756 | 0 | 2015 | 627 | 0 | 2015 | 627 |
| 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 | 0.97 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 9.3 | 0.0 | 12.9 | 0.0 | 3.7 | 0.0 | 0.0 | 13.1 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.1 | 0.0 | 2.1 | 0.0 | 0.4 | 0.0 | 0.0 | 1.2 | 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 | | | | 2.1 | 0.0 | 7.2 | 0.0 | 0.8 | 0.0 | 0.0 | 4.9 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 9.4 | 0.0 | 15.0 | 0.0 | 4.0 | 0.0 | 0.0 | 14.3 | 0.0 |
| LnGrp LOS | | | | A | | B | | A | | | B | |
| Approach Vol, veh/h | | | | | 1474 | | | 587 | | | 1163 | |
| Approach Delay, s/veh | | | | | 13.4 | | | 4.0 | | | 14.3 | |
| Approach LOS | | | | | B | | | A | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 35.5 | | | | 35.5 | | 29.5 |
| Change Period (Y+Rc), s | | 4.0 | | | | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | | 22.0 | | | | 22.0 | | 35.0 |
| Max Q Clear Time (g_c+I1), s | | 3.7 | | | | 11.9 | | 19.8 |
| Green Ext Time (p_c), s | | 10.8 | | | | 7.0 | | 5.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.0 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 0 | 590 | 0 | 0 | 0 | 0 | 760 | 170 | 0 | 1090 | 380 |
| 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 | 130 | 0 | 626 | | | | 0 | 826 | 0 | 0 | 1185 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1023 | 0 | 828 | | | | 0 | 2780 | 866 | 0 | 2780 | 866 |
| Arrive On Green | 0.30 | 0.00 | 0.30 | | | | 0.00 | 0.55 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 130 | 0 | 626 | | | | 0 | 826 | 0 | 0 | 1185 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 1.4 | 0.0 | 10.4 | | | | 0.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 1.4 | 0.0 | 10.4 | | | | 0.0 | 4.5 | 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 | 1023 | 0 | 828 | | | | 0 | 2780 | 866 | 0 | 2780 | 866 |
| V/C Ratio(X) | 0.13 | 0.00 | 0.76 | | | | 0.00 | 0.30 | 0.00 | 0.00 | 0.43 | 0.00 |
| Avail Cap(c_a), veh/h | 1949 | 0 | 1578 | | | | 0 | 2780 | 866 | 0 | 2780 | 866 |
| 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 | 0.87 | 0.00 |
| Uniform Delay (d), s/veh | 13.1 | 0.0 | 16.3 | | | | 0.0 | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 1.4 | | | | 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 | 0.7 | 0.0 | 4.2 | | | | 0.0 | 2.1 | 0.0 | 0.0 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 13.2 | 0.0 | 17.8 | | | | 0.0 | 6.6 | 0.0 | 0.0 | 0.4 | 0.0 |
| LnGrp LOS | B | | B | | | | | A | | | A | |
| Approach Vol, veh/h | | 756 | | | | | | 826 | | | 1185 | |
| Approach Delay, s/veh | | 17.0 | | | | | | 6.6 | | | 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 | | 45.8 | | 19.2 | | 45.8 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 28.0 | | 29.0 | | 28.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.5 | | 12.4 | | 2.0 | | |
| Green Ext Time (p_c), s | | 13.7 | | 2.8 | | 15.4 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.8 |
| HCM 2010 LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 160 | 180 | 60 | 90 | 450 | 550 | 140 | 1050 | 110 | 480 | 1400 | 190 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 174 | 196 | 20 | 98 | 489 | 497 | 152 | 1141 | 35 | 522 | 1522 | 64 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 175 | 1680 | 521 | 155 | 1651 | 512 | 218 | 1577 | 489 | 524 | 2029 | 629 |
| Arrive On Green | 0.05 | 0.33 | 0.33 | 0.05 | 0.32 | 0.32 | 0.06 | 0.31 | 0.31 | 0.15 | 0.40 | 0.40 |
| Sat Flow, veh/h | 3442 | 5085 | 1576 | 3442 | 5085 | 1576 | 3442 | 5085 | 1576 | 3442 | 5085 | 1577 |
| Grp Volume(v), veh/h | 174 | 196 | 20 | 98 | 489 | 497 | 152 | 1141 | 35 | 522 | 1522 | 64 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1576 | 1721 | 1695 | 1576 | 1721 | 1695 | 1576 | 1721 | 1695 | 1577 |
| Q Serve(g_s), s | 5.0 | 2.6 | 0.8 | 2.8 | 7.1 | 30.7 | 4.3 | 19.7 | 1.5 | 14.9 | 25.3 | 2.5 |
| Cycle Q Clear(g_c), s | 5.0 | 2.6 | 0.8 | 2.8 | 7.1 | 30.7 | 4.3 | 19.7 | 1.5 | 14.9 | 25.3 | 2.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 175 | 1680 | 521 | 155 | 1651 | 512 | 218 | 1577 | 489 | 524 | 2029 | 629 |
| V/C Ratio(X) | 1.00 | 0.12 | 0.04 | 0.63 | 0.30 | 0.97 | 0.70 | 0.72 | 0.07 | 1.00 | 0.75 | 0.10 |
| Avail Cap(c_a), veh/h | 175 | 1680 | 521 | 175 | 1651 | 512 | 279 | 1651 | 512 | 524 | 2029 | 629 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.8 | 23.0 | 22.4 | 46.3 | 24.9 | 32.8 | 45.2 | 30.2 | 24.0 | 41.8 | 25.4 | 18.6 |
| Incr Delay (d2), s/veh | 67.1 | 0.0 | 0.0 | 6.0 | 0.1 | 32.4 | 5.2 | 1.5 | 0.1 | 38.4 | 1.6 | 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 | 4.0 | 1.2 | 0.4 | 1.4 | 3.3 | 17.9 | 2.2 | 9.4 | 0.7 | 9.8 | 12.1 | 1.1 |
| LnGrp Delay(d),s/veh | 113.8 | 23.0 | 22.4 | 52.3 | 25.0 | 65.2 | 50.5 | 31.8 | 24.1 | 80.1 | 27.0 | 18.6 |
| LnGrp LOS | F | C | C | D | C | E | D | C | C | F | C | B |
| Approach Vol, veh/h | | 390 | | | 1084 | | | 1328 | | | 2108 | |
| Approach Delay, s/veh | | 63.5 | | | 45.9 | | | 33.7 | | | 39.9 | |
| Approach LOS | | E | | | 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 | 19.0 | 34.6 | 8.4 | 36.6 | 10.2 | 43.3 | 9.0 | 36.0 |
| 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 | 15.0 | 32.0 | 5.0 | 32.0 | 8.0 | 39.0 | 5.0 | 32.0 |
| Max Q Clear Time (g_c+I1), s | 16.9 | 21.7 | 4.8 | 4.6 | 6.3 | 27.3 | 7.0 | 32.7 |
| Green Ext Time (p_c), s | 0.0 | 8.7 | 0.0 | 6.9 | 0.1 | 10.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 41.4 |
| HCM 2010 LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 170 | 300 | 300 | 10 | 340 | 120 | 550 | 40 | 10 | 10 | 50 | 200 |
| 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 | | 0.99 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 185 | 326 | 79 | 11 | 370 | 27 | 598 | 43 | 6 | 11 | 54 | 70 |
| Adj No. of Lanes | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 265 | 566 | 477 | 19 | 443 | 374 | 654 | 866 | 732 | 19 | 200 | 167 |
| Arrive On Green | 0.08 | 0.30 | 0.30 | 0.01 | 0.24 | 0.24 | 0.37 | 0.46 | 0.46 | 0.01 | 0.11 | 0.11 |
| Sat Flow, veh/h | 3442 | 1863 | 1570 | 1774 | 1863 | 1573 | 1774 | 1863 | 1575 | 1774 | 1863 | 1561 |
| Grp Volume(v), veh/h | 185 | 326 | 79 | 11 | 370 | 27 | 598 | 43 | 6 | 11 | 54 | 70 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1570 | 1774 | 1863 | 1573 | 1774 | 1863 | 1575 | 1774 | 1863 | 1561 |
| Q Serve(g_s), s | 4.0 | 11.3 | 2.8 | 0.5 | 14.4 | 1.0 | 24.5 | 1.0 | 0.2 | 0.5 | 2.0 | 3.2 |
| Cycle Q Clear(g_c), s | 4.0 | 11.3 | 2.8 | 0.5 | 14.4 | 1.0 | 24.5 | 1.0 | 0.2 | 0.5 | 2.0 | 3.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 265 | 566 | 477 | 19 | 443 | 374 | 654 | 866 | 732 | 19 | 200 | 167 |
| V/C Ratio(X) | 0.70 | 0.58 | 0.17 | 0.57 | 0.84 | 0.07 | 0.91 | 0.05 | 0.01 | 0.57 | 0.27 | 0.42 |
| Avail Cap(c_a), veh/h | 270 | 566 | 477 | 93 | 512 | 432 | 859 | 1536 | 1299 | 93 | 731 | 613 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.4 | 22.4 | 19.5 | 37.6 | 27.7 | 22.6 | 23.0 | 11.2 | 11.0 | 37.6 | 31.4 | 31.9 |
| Incr Delay (d2), s/veh | 7.5 | 1.4 | 0.2 | 23.6 | 10.2 | 0.1 | 11.8 | 0.0 | 0.0 | 23.6 | 0.7 | 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 | 2.2 | 6.0 | 1.2 | 0.4 | 8.7 | 0.4 | 14.1 | 0.5 | 0.1 | 0.4 | 1.1 | 1.5 |
| LnGrp Delay(d),s/veh | 41.9 | 23.9 | 19.6 | 61.3 | 37.9 | 22.7 | 34.8 | 11.2 | 11.0 | 61.3 | 32.1 | 33.5 |
| LnGrp LOS | D | C | B | E | D | C | C | B | B | E | C | C |
| Approach Vol, veh/h | | 590 | | | 408 | | | 647 | | | 135 | |
| Approach Delay, s/veh | | 29.0 | | | 37.5 | | | 33.0 | | | 35.2 | |
| Approach LOS | | C | | | 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 | 4.8 | 39.5 | 4.8 | 27.2 | 32.2 | 12.2 | 9.9 | 22.2 |
| 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 | 63.0 | 4.0 | 23.0 | 37.0 | 30.0 | 6.0 | 21.0 |
| Max Q Clear Time (g_c+I1), s | 2.5 | 3.0 | 2.5 | 13.3 | 26.5 | 5.2 | 6.0 | 16.4 |
| Green Ext Time (p_c), s | 0.0 | 0.8 | 0.0 | 3.0 | 1.6 | 0.7 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 32.9 |
| HCM 2010 LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.0 |
| Intersection LOS | A |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 120 | 468 | 44 | 109 |
| Demand Flow Rate, veh/h | 123 | 477 | 44 | 111 |
| Vehicles Circulating, veh/h | 122 | 56 | 201 | 67 |
| Vehicles Exiting, veh/h | 56 | 189 | 44 | 466 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 0 | 0 | 0 | 0 |
| Ped Cap Adj | 1.000 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh | 4.8 | 8.4 | 4.3 | 4.4 |
| Approach LOS | A | A | A | A |

| Lane | Left | Left | Left | Left |
|---|---|---|---|---|
| Designated Moves | LTR | LTR | LTR | LTR |
| Assumed Moves | LTR | LTR | LTR | LTR |
| RT Channelized | | | | |
| Lane Util | 1.000 | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 123 | 477 | 44 | 111 |
| Cap Entry Lane, veh/h | 1000 | 1068 | 924 | 1057 |
| Entry HV Adj Factor | 0.979 | 0.982 | 0.995 | 0.980 |
| Flow Entry, veh/h | 120 | 468 | 44 | 109 |
| Cap Entry, veh/h | 980 | 1049 | 920 | 1036 |
| V/C Ratio | 0.123 | 0.446 | 0.048 | 0.105 |
| Control Delay, s/veh | 4.8 | 8.4 | 4.3 | 4.4 |
| LOS | A | A | A | A |
| 95th %tile Queue, veh | 0 | 2 | 0 | 0 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 30 | 20 | 50 | 60 | 10 | 10 | 800 | 50 | 10 | 1210 | 360 |
| 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 | | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 82 | 101 | 1 | 54 | 65 | 2 | 11 | 870 | 49 | 11 | 1315 | 159 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 193 | 163 | 136 | 137 | 4 | 20 | 2237 | 126 | 20 | 2309 | 717 |
| Arrive On Green | 0.10 | 0.10 | 0.10 | 0.08 | 0.08 | 0.08 | 0.01 | 0.45 | 0.45 | 0.01 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1774 | 1863 | 1574 | 1774 | 1797 | 55 | 1774 | 4927 | 277 | 1774 | 5085 | 1580 |
| Grp Volume(v), veh/h | 82 | 101 | 1 | 54 | 0 | 67 | 11 | 598 | 321 | 11 | 1315 | 159 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1574 | 1774 | 0 | 1853 | 1774 | 1695 | 1813 | 1774 | 1695 | 1580 |
| Q Serve(g_s), s | 2.0 | 2.3 | 0.0 | 1.3 | 0.0 | 1.6 | 0.3 | 5.3 | 5.3 | 0.3 | 8.6 | 2.8 |
| Cycle Q Clear(g_c), s | 2.0 | 2.3 | 0.0 | 1.3 | 0.0 | 1.6 | 0.3 | 5.3 | 5.3 | 0.3 | 8.6 | 2.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.03 | 1.00 | | 0.15 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 183 | 193 | 163 | 136 | 0 | 142 | 20 | 1539 | 823 | 20 | 2309 | 717 |
| V/C Ratio(X) | 0.45 | 0.52 | 0.01 | 0.40 | 0.00 | 0.47 | 0.54 | 0.39 | 0.39 | 0.54 | 0.57 | 0.22 |
| Avail Cap(c_a), veh/h | 904 | 950 | 802 | 1140 | 0 | 1191 | 157 | 1728 | 924 | 157 | 2592 | 805 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.0 | 19.2 | 18.1 | 19.8 | 0.0 | 20.0 | 22.2 | 8.2 | 8.2 | 22.2 | 9.1 | 7.5 |
| Incr Delay (d2), s/veh | 1.7 | 2.2 | 0.0 | 1.9 | 0.0 | 2.4 | 20.7 | 0.2 | 0.3 | 20.7 | 0.2 | 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 | 1.0 | 1.3 | 0.0 | 0.7 | 0.0 | 0.9 | 0.3 | 2.4 | 2.7 | 0.3 | 3.9 | 1.2 |
| LnGrp Delay(d),s/veh | 20.7 | 21.4 | 18.2 | 21.7 | 0.0 | 22.4 | 42.9 | 8.3 | 8.5 | 42.9 | 9.3 | 7.6 |
| LnGrp LOS | C | C | B | C | | C | D | A | A | D | A | A |
| Approach Vol, veh/h | | 184 | | | 121 | | | 930 | | | 1485 | |
| Approach Delay, s/veh | | 21.1 | | | 22.1 | | | 8.8 | | | 9.4 | |
| Approach LOS | | C | | | 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 | 4.5 | 24.5 | | 8.7 | 4.5 | 24.5 | | 7.5 |
| Change Period (Y+Rc), s | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | 4.0 | 23.0 | | 23.0 | 4.0 | 23.0 | | 29.0 |
| Max Q Clear Time (g_c+I1), s | 2.3 | 7.3 | | 4.3 | 2.3 | 10.6 | | 3.6 |
| Green Ext Time (p_c), s | 0.0 | 12.0 | | 0.6 | 0.0 | 9.9 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.5 |
| HCM 2010 LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 20 | 10 | 10 | 40 | 70 | 10 | 1200 | 20 | 190 | 1210 | 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 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 33 | 22 | 1 | 11 | 43 | 5 | 11 | 1304 | 8 | 207 | 1315 | 87 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 52 | 193 | 9 | 20 | 148 | 17 | 20 | 2072 | 641 | 260 | 2761 | 856 |
| Arrive On Green | 0.03 | 0.11 | 0.11 | 0.01 | 0.09 | 0.09 | 0.01 | 0.41 | 0.41 | 0.15 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1774 | 1767 | 80 | 1774 | 1635 | 190 | 1774 | 5085 | 1574 | 1774 | 5085 | 1576 |
| Grp Volume(v), veh/h | 33 | 0 | 23 | 11 | 0 | 48 | 11 | 1304 | 8 | 207 | 1315 | 87 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1847 | 1774 | 0 | 1825 | 1774 | 1695 | 1574 | 1774 | 1695 | 1576 |
| Q Serve(g_s), s | 0.9 | 0.0 | 0.6 | 0.3 | 0.0 | 1.2 | 0.3 | 10.0 | 0.1 | 5.5 | 7.8 | 1.3 |
| Cycle Q Clear(g_c), s | 0.9 | 0.0 | 0.6 | 0.3 | 0.0 | 1.2 | 0.3 | 10.0 | 0.1 | 5.5 | 7.8 | 1.3 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 52 | 0 | 201 | 20 | 0 | 166 | 20 | 2072 | 641 | 260 | 2761 | 856 |
| V/C Ratio(X) | 0.63 | 0.00 | 0.11 | 0.55 | 0.00 | 0.29 | 0.55 | 0.63 | 0.01 | 0.79 | 0.48 | 0.10 |
| Avail Cap(c_a), veh/h | 144 | 0 | 1089 | 144 | 0 | 1076 | 144 | 2172 | 672 | 361 | 2792 | 865 |
| 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 | 23.6 | 0.0 | 19.8 | 24.2 | 0.0 | 20.9 | 24.2 | 11.6 | 8.7 | 20.3 | 6.9 | 5.4 |
| Incr Delay (d2), s/veh | 11.8 | 0.0 | 0.2 | 21.1 | 0.0 | 1.0 | 21.1 | 0.5 | 0.0 | 8.2 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.0 | 0.3 | 0.3 | 0.0 | 0.6 | 0.3 | 4.7 | 0.1 | 3.3 | 3.6 | 0.6 |
| LnGrp Delay(d),s/veh | 35.4 | 0.0 | 20.0 | 45.3 | 0.0 | 21.8 | 45.3 | 12.2 | 8.7 | 28.4 | 7.1 | 5.5 |
| LnGrp LOS | D | | C | D | | C | D | B | A | C | A | A |
| Approach Vol, veh/h | | 56 | | | 59 | | | 1323 | | | 1609 | |
| Approach Delay, s/veh | | 29.1 | | | 26.2 | | | 12.4 | | | 9.7 | |
| Approach LOS | | C | | | C | | | B | | | A | |

| 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 | 11.2 | 24.0 | 4.6 | 9.4 | 4.6 | 30.7 | 5.5 | 8.5 |
| 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 | 10.0 | 21.0 | 4.0 | 29.0 | 4.0 | 27.0 | 4.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 7.5 | 12.0 | 2.3 | 2.6 | 2.3 | 9.8 | 2.9 | 3.2 |
| Green Ext Time (p_c), s | 0.1 | 8.0 | 0.0 | 0.3 | 0.0 | 14.3 | 0.0 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.6 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 190 | 30 | 10 | 80 | 580 | 10 | 10 | 10 | 290 | 40 | 30 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 207 | 23 | 11 | 87 | 121 | 11 | 11 | 0 | 315 | 43 | 8 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 21 | 360 | 40 | 21 | 407 | 342 | 21 | 147 | 0 | 408 | 454 | 84 |
| Arrive On Green | 0.01 | 0.22 | 0.22 | 0.01 | 0.22 | 0.22 | 0.01 | 0.08 | 0.00 | 0.23 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1774 | 1645 | 183 | 1774 | 1863 | 1565 | 1774 | 1863 | 0 | 1774 | 1526 | 284 |
| Grp Volume(v), veh/h | 11 | 0 | 230 | 11 | 87 | 121 | 11 | 11 | 0 | 315 | 0 | 51 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1828 | 1774 | 1863 | 1565 | 1774 | 1863 | 0 | 1774 | 0 | 1810 |
| Q Serve(g_s), s | 0.2 | 0.0 | 3.9 | 0.2 | 1.3 | 2.3 | 0.2 | 0.2 | 0.0 | 5.8 | 0.0 | 0.7 |
| Cycle Q Clear(g_c), s | 0.2 | 0.0 | 3.9 | 0.2 | 1.3 | 2.3 | 0.2 | 0.2 | 0.0 | 5.8 | 0.0 | 0.7 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 21 | 0 | 400 | 21 | 407 | 342 | 21 | 147 | 0 | 408 | 0 | 538 |
| V/C Ratio(X) | 0.53 | 0.00 | 0.58 | 0.53 | 0.21 | 0.35 | 0.53 | 0.07 | 0.00 | 0.77 | 0.00 | 0.09 |
| Avail Cap(c_a), veh/h | 204 | 0 | 842 | 204 | 858 | 721 | 204 | 965 | 0 | 817 | 0 | 1563 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.1 | 0.0 | 12.1 | 17.1 | 11.1 | 11.5 | 17.1 | 14.8 | 0.0 | 12.5 | 0.0 | 8.8 |
| Incr Delay (d2), s/veh | 19.8 | 0.0 | 1.3 | 19.8 | 0.3 | 0.6 | 19.8 | 0.2 | 0.0 | 3.1 | 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 | 0.2 | 0.0 | 2.1 | 0.2 | 0.7 | 1.0 | 0.2 | 0.1 | 0.0 | 3.2 | 0.0 | 0.4 |
| LnGrp Delay(d),s/veh | 36.9 | 0.0 | 13.4 | 36.9 | 11.4 | 12.1 | 36.9 | 15.0 | 0.0 | 15.6 | 0.0 | 8.9 |
| LnGrp LOS | D | | B | D | B | B | D | B | | B | | A |
| Approach Vol, veh/h | | 241 | | | 219 | | | 22 | | | 366 | |
| Approach Delay, s/veh | | 14.5 | | | 13.1 | | | 26.0 | | | 14.7 | |
| Approach LOS | | B | | | B | | | 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 | 12.0 | 6.7 | 4.4 | 11.6 | 4.4 | 14.3 | 4.4 | 11.6 |
| 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 | 16.0 | 18.0 | 4.0 | 16.0 | 4.0 | 30.0 | 4.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 7.8 | 2.2 | 2.2 | 5.9 | 2.2 | 2.7 | 2.2 | 4.3 |
| Green Ext Time (p_c), s | 0.6 | 0.2 | 0.0 | 1.5 | 0.0 | 0.3 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.5 |
| HCM 2010 LOS | B |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Vol, veh/h | 50 | 80 | 550 | 30 | 40 | 450 |
| Conflicting Peds, #/hr | 0 | 5 | 0 | 5 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 200 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 54 | 87 | 598 | 33 | 43 | 489 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1195 | 619 | 0 | 0 | 635 | 0 |
| Stage 1 | 619 | - | - | - | - | - |
| Stage 2 | 576 | - | - | - | - | - |
| 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 | 206 | 489 | - | - | 948 | - |
| Stage 1 | 537 | - | - | - | - | - |
| Stage 2 | 562 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 192 | 487 | - | - | 948 | - |
| Mov Cap-2 Maneuver | 192 | - | - | - | - | - |
| Stage 1 | 535 | - | - | - | - | - |
| Stage 2 | 525 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 20.5 | 0 | 0.7 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | WBLn2 | SBL | SBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 192 | 487 | 948 | - |
| HCM Lane V/C Ratio | - | - | 0.283 | 0.179 | 0.046 | - |
| HCM Control Delay (s) | - | - | 31 | 14 | 9 | 0 |
| HCM Lane LOS | - | - | D | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 1.1 | 0.6 | 0.1 | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 4.6 |
| Intersection LOS | A |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 66 | 185 | 109 | 44 |
| Demand Flow Rate, veh/h | 67 | 188 | 111 | 44 |
| Vehicles Circulating, veh/h | 177 | 33 | 56 | 177 |
| Vehicles Exiting, veh/h | 44 | 134 | 188 | 44 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 10 | 10 | 10 | 10 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 4.5 | 4.9 | 4.4 | 4.3 |
| Approach LOS | A | A | A | A |

| Lane | Left | Left | Left | Left |
|---|---|---|---|---|
| Designated Moves | LTR | LTR | LTR | LTR |
| Assumed Moves | LTR | LTR | LTR | LTR |
| RT Channelized | | | | |
| Lane Util | 1.000 | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 67 | 188 | 111 | 44 |
| Cap Entry Lane, veh/h | 947 | 1093 | 1068 | 947 |
| Entry HV Adj Factor | 0.990 | 0.982 | 0.980 | 0.990 |
| Flow Entry, veh/h | 66 | 185 | 109 | 44 |
| Cap Entry, veh/h | 936 | 1072 | 1046 | 936 |
| V/C Ratio | 0.071 | 0.172 | 0.104 | 0.047 |
| Control Delay, s/veh | 4.5 | 4.9 | 4.4 | 4.3 |
| LOS | A | A | A | A |
| 95th %tile Queue, veh | 0 | 1 | 0 | 0 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 70 | 50 | 50 | 790 | 1160 | 120 |
| 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 | | | 0.99 |
| 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 | 76 | 4 | 54 | 859 | 1261 | 79 |
| Adj No. of Lanes | 1 | 1 | 1 | 2 | 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 | 109 | 97 | 427 | 2532 | 2532 | 1125 |
| Arrive On Green | 0.06 | 0.06 | 0.72 | 0.72 | 0.72 | 0.72 |
| Sat Flow, veh/h | 1774 | 1583 | 406 | 3632 | 3632 | 1572 |
| Grp Volume(v), veh/h | 76 | 4 | 54 | 859 | 1261 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1583 | 406 | 1770 | 1770 | 1572 |
| Q Serve(g_s), s | 1.5 | 0.1 | 2.4 | 3.3 | 5.6 | 0.5 |
| Cycle Q Clear(g_c), s | 1.5 | 0.1 | 8.1 | 3.3 | 5.6 | 0.5 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 109 | 97 | 427 | 2532 | 2532 | 1125 |
| V/C Ratio(X) | 0.70 | 0.04 | 0.13 | 0.34 | 0.50 | 0.07 |
| Avail Cap(c_a), veh/h | 792 | 707 | 488 | 3062 | 3062 | 1360 |
| 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 | 16.5 | 15.8 | 4.0 | 1.9 | 2.3 | 1.5 |
| Incr Delay (d2), s/veh | 7.9 | 0.2 | 0.1 | 0.1 | 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 | 1.0 | 0.0 | 0.3 | 1.6 | 2.7 | 0.2 |
| LnGrp Delay(d),s/veh | 24.3 | 16.0 | 4.2 | 2.0 | 2.4 | 1.6 |
| LnGrp LOS | C | B | A | A | A | A |
| Approach Vol, veh/h | 80 | | | 913 | 1340 | |
| Approach Delay, s/veh | 23.9 | | | 2.1 | 2.4 | |
| Approach LOS | C | | | A | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 29.6 | | 6.2 | | 29.6 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 31.0 | | 16.0 | | 31.0 | | |
| Max Q Clear Time (g_c+I1), s | | 10.1 | | 3.5 | | 7.6 | | |
| Green Ext Time (p_c), s | | 15.6 | | 0.1 | | 16.9 | | |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 3.0 |
| HCM 2010 LOS | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 150 | 50 | 20 | 60 | 70 | 110 | 10 | 600 | 30 | 50 | 450 | 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 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 163 | 54 | 5 | 65 | 76 | 12 | 11 | 652 | 9 | 54 | 489 | 32 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 211 | 346 | 291 | 91 | 219 | 184 | 20 | 1154 | 512 | 80 | 1272 | 565 |
| Arrive On Green | 0.12 | 0.19 | 0.19 | 0.05 | 0.12 | 0.12 | 0.01 | 0.33 | 0.33 | 0.04 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1774 | 1863 | 1571 | 1774 | 1863 | 1563 | 1774 | 3539 | 1571 | 1774 | 3539 | 1572 |
| Grp Volume(v), veh/h | 163 | 54 | 5 | 65 | 76 | 12 | 11 | 652 | 9 | 54 | 489 | 32 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1571 | 1774 | 1863 | 1563 | 1774 | 1770 | 1571 | 1774 | 1770 | 1572 |
| Q Serve(g_s), s | 3.6 | 1.0 | 0.1 | 1.5 | 1.5 | 0.3 | 0.3 | 6.2 | 0.2 | 1.2 | 4.2 | 0.5 |
| Cycle Q Clear(g_c), s | 3.6 | 1.0 | 0.1 | 1.5 | 1.5 | 0.3 | 0.3 | 6.2 | 0.2 | 1.2 | 4.2 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 211 | 346 | 291 | 91 | 219 | 184 | 20 | 1154 | 512 | 80 | 1272 | 565 |
| V/C Ratio(X) | 0.77 | 0.16 | 0.02 | 0.72 | 0.35 | 0.07 | 0.54 | 0.57 | 0.02 | 0.68 | 0.38 | 0.06 |
| Avail Cap(c_a), veh/h | 392 | 1188 | 1001 | 261 | 1051 | 882 | 174 | 1562 | 694 | 174 | 1562 | 694 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.4 | 13.9 | 13.6 | 19.1 | 16.5 | 16.0 | 20.0 | 11.4 | 9.3 | 19.2 | 9.7 | 8.5 |
| Incr Delay (d2), s/veh | 5.9 | 0.2 | 0.0 | 10.1 | 0.9 | 0.1 | 20.4 | 0.4 | 0.0 | 9.6 | 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 | 2.1 | 0.5 | 0.0 | 1.0 | 0.8 | 0.1 | 0.2 | 3.1 | 0.1 | 0.8 | 2.1 | 0.2 |
| LnGrp Delay(d),s/veh | 23.4 | 14.1 | 13.6 | 29.1 | 17.5 | 16.1 | 40.4 | 11.8 | 9.3 | 28.8 | 9.9 | 8.6 |
| LnGrp LOS | C | B | B | C | B | B | D | B | A | C | A | A |
| Approach Vol, veh/h | | 222 | | | 153 | | | 672 | | | 575 | |
| Approach Delay, s/veh | | 20.9 | | | 22.3 | | | 12.2 | | | 11.6 | |
| 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 | 5.8 | 17.3 | 6.1 | 11.6 | 4.5 | 18.7 | 8.8 | 8.8 |
| 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 | 18.0 | 6.0 | 26.0 | 4.0 | 18.0 | 9.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 8.2 | 3.5 | 3.0 | 2.3 | 6.2 | 5.6 | 3.5 |
| Green Ext Time (p_c), s | 0.0 | 4.9 | 0.0 | 0.6 | 0.0 | 5.5 | 0.1 | 0.6 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 14.1 |
| HCM 2010 LOS | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 50 | 60 | 90 | 70 | 110 | 110 | 90 | 420 | 30 | 50 | 430 | 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 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 54 | 65 | 10 | 76 | 120 | 46 | 98 | 457 | 29 | 54 | 467 | 20 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 78 | 240 | 37 | 98 | 209 | 80 | 124 | 656 | 42 | 78 | 626 | 27 |
| Arrive On Green | 0.04 | 0.15 | 0.15 | 0.06 | 0.16 | 0.16 | 0.07 | 0.38 | 0.38 | 0.04 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1774 | 1573 | 242 | 1774 | 1278 | 490 | 1774 | 1733 | 110 | 1774 | 1773 | 76 |
| Grp Volume(v), veh/h | 54 | 0 | 75 | 76 | 0 | 166 | 98 | 0 | 486 | 54 | 0 | 487 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1815 | 1774 | 0 | 1767 | 1774 | 0 | 1842 | 1774 | 0 | 1849 |
| Q Serve(g_s), s | 1.3 | 0.0 | 1.6 | 1.8 | 0.0 | 3.8 | 2.4 | 0.0 | 9.6 | 1.3 | 0.0 | 10.0 |
| Cycle Q Clear(g_c), s | 1.3 | 0.0 | 1.6 | 1.8 | 0.0 | 3.8 | 2.4 | 0.0 | 9.6 | 1.3 | 0.0 | 10.0 |
| Prop In Lane | 1.00 | | 0.13 | 1.00 | | 0.28 | 1.00 | | 0.06 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 78 | 0 | 277 | 98 | 0 | 290 | 124 | 0 | 697 | 78 | 0 | 652 |
| V/C Ratio(X) | 0.69 | 0.00 | 0.27 | 0.77 | 0.00 | 0.57 | 0.79 | 0.00 | 0.70 | 0.69 | 0.00 | 0.75 |
| Avail Cap(c_a), veh/h | 164 | 0 | 713 | 164 | 0 | 694 | 164 | 0 | 808 | 164 | 0 | 811 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.4 | 0.0 | 16.2 | 20.2 | 0.0 | 16.7 | 19.8 | 0.0 | 11.4 | 20.4 | 0.0 | 12.3 |
| Incr Delay (d2), s/veh | 10.3 | 0.0 | 0.5 | 12.1 | 0.0 | 1.8 | 17.4 | 0.0 | 2.2 | 10.3 | 0.0 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 0.0 | 0.8 | 1.2 | 0.0 | 1.9 | 1.7 | 0.0 | 5.3 | 0.9 | 0.0 | 5.5 |
| LnGrp Delay(d),s/veh | 30.7 | 0.0 | 16.7 | 32.3 | 0.0 | 18.5 | 37.3 | 0.0 | 13.6 | 30.7 | 0.0 | 15.3 |
| LnGrp LOS | C | | B | C | | B | D | | B | C | | B |
| Approach Vol, veh/h | | 129 | | | 242 | | | 584 | | | 541 | |
| Approach Delay, s/veh | | 22.6 | | | 22.8 | | | 17.5 | | | 16.8 | |
| 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 | 5.9 | 20.4 | 6.4 | 10.6 | 7.0 | 19.3 | 5.9 | 11.1 |
| 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 | 19.0 | 4.0 | 17.0 | 4.0 | 19.0 | 4.0 | 17.0 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 11.6 | 3.8 | 3.6 | 4.4 | 12.0 | 3.3 | 5.8 |
| Green Ext Time (p_c), s | 0.0 | 3.3 | 0.0 | 0.9 | 0.0 | 3.2 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.6 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 100 | 10 | 50 | 10 | 10 | 40 | 20 | 700 | 10 | 20 | 1040 | 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 | | 0.98 | 1.00 | | 0.97 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 109 | 11 | 8 | 11 | 11 | 2 | 22 | 761 | 10 | 22 | 1130 | 150 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 139 | 158 | 115 | 20 | 139 | 25 | 37 | 1808 | 24 | 37 | 1587 | 210 |
| Arrive On Green | 0.08 | 0.16 | 0.16 | 0.01 | 0.09 | 0.09 | 0.02 | 0.51 | 0.51 | 0.02 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1774 | 995 | 724 | 1774 | 1525 | 277 | 1774 | 3577 | 47 | 1774 | 3138 | 416 |
| Grp Volume(v), veh/h | 109 | 0 | 19 | 11 | 0 | 13 | 22 | 376 | 395 | 22 | 636 | 644 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1719 | 1774 | 0 | 1803 | 1774 | 1770 | 1854 | 1774 | 1770 | 1785 |
| Q Serve(g_s), s | 3.2 | 0.0 | 0.5 | 0.3 | 0.0 | 0.3 | 0.6 | 7.0 | 7.0 | 0.6 | 14.6 | 14.7 |
| Cycle Q Clear(g_c), s | 3.2 | 0.0 | 0.5 | 0.3 | 0.0 | 0.3 | 0.6 | 7.0 | 7.0 | 0.6 | 14.6 | 14.7 |
| Prop In Lane | 1.00 | | 0.42 | 1.00 | | 0.15 | 1.00 | | 0.03 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 139 | 0 | 272 | 20 | 0 | 164 | 37 | 895 | 937 | 37 | 895 | 902 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.07 | 0.55 | 0.00 | 0.08 | 0.59 | 0.42 | 0.42 | 0.59 | 0.71 | 0.71 |
| Avail Cap(c_a), veh/h | 202 | 0 | 816 | 135 | 0 | 787 | 135 | 1042 | 1091 | 135 | 1042 | 1050 |
| 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 | 23.8 | 0.0 | 18.9 | 25.9 | 0.0 | 21.9 | 25.6 | 8.2 | 8.2 | 25.6 | 10.0 | 10.1 |
| Incr Delay (d2), s/veh | 11.5 | 0.0 | 0.1 | 21.4 | 0.0 | 0.2 | 14.2 | 0.3 | 0.3 | 14.2 | 1.9 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 0.2 | 0.3 | 0.0 | 0.2 | 0.5 | 3.4 | 3.6 | 0.5 | 7.5 | 7.6 |
| LnGrp Delay(d),s/veh | 35.3 | 0.0 | 19.0 | 47.3 | 0.0 | 22.1 | 39.8 | 8.5 | 8.5 | 39.8 | 11.9 | 12.0 |
| LnGrp LOS | D | | B | D | | C | D | A | A | D | B | B |
| Approach Vol, veh/h | | 128 | | | 24 | | | 793 | | | 1302 | |
| Approach Delay, s/veh | | 32.9 | | | 33.7 | | | 9.4 | | | 12.4 | |
| Approach LOS | | C | | | C | | | A | | | 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 | 5.1 | 30.6 | 4.6 | 12.3 | 5.1 | 30.6 | 8.1 | 8.8 |
| 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 | 31.0 | 4.0 | 25.0 | 4.0 | 31.0 | 6.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 2.6 | 9.0 | 2.3 | 2.5 | 2.6 | 16.7 | 5.2 | 2.3 |
| Green Ext Time (p_c), s | 0.0 | 13.4 | 0.0 | 0.1 | 0.0 | 9.9 | 0.0 | 0.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 12.7 |
| HCM 2010 LOS | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 1060 | 330 | 40 | 890 | 290 | 440 | 430 | 50 | 510 | 580 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 1152 | 122 | 42 | 967 | 108 | 458 | 448 | 41 | 554 | 604 | 9 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 3 | 1 | 2 | 2 | 0 | 2 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.96 | 0.96 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.92 | 0.96 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 19 | 1267 | 566 | 54 | 1921 | 597 | 540 | 754 | 69 | 613 | 896 | 13 |
| Arrive On Green | 0.01 | 0.36 | 0.36 | 0.03 | 0.38 | 0.38 | 0.16 | 0.23 | 0.23 | 0.18 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1774 | 3539 | 1581 | 1774 | 5085 | 1581 | 3442 | 3280 | 299 | 3442 | 3570 | 53 |
| Grp Volume(v), veh/h | 11 | 1152 | 122 | 42 | 967 | 108 | 458 | 241 | 248 | 554 | 299 | 314 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1581 | 1774 | 1695 | 1581 | 1721 | 1770 | 1809 | 1721 | 1770 | 1853 |
| Q Serve(g_s), s | 0.5 | 24.4 | 4.2 | 1.8 | 11.5 | 3.6 | 10.2 | 9.5 | 9.6 | 12.4 | 12.0 | 12.0 |
| Cycle Q Clear(g_c), s | 0.5 | 24.4 | 4.2 | 1.8 | 11.5 | 3.6 | 10.2 | 9.5 | 9.6 | 12.4 | 12.0 | 12.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.17 | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 19 | 1267 | 566 | 54 | 1921 | 597 | 540 | 407 | 416 | 613 | 444 | 465 |
| V/C Ratio(X) | 0.57 | 0.91 | 0.22 | 0.78 | 0.50 | 0.18 | 0.85 | 0.59 | 0.60 | 0.90 | 0.67 | 0.67 |
| Avail Cap(c_a), veh/h | 90 | 1305 | 583 | 90 | 1921 | 597 | 569 | 608 | 621 | 613 | 630 | 660 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.7 | 24.0 | 17.6 | 37.8 | 18.8 | 16.3 | 32.2 | 27.0 | 27.0 | 31.7 | 26.6 | 26.6 |
| Incr Delay (d2), s/veh | 23.9 | 9.4 | 0.2 | 20.6 | 0.2 | 0.1 | 11.1 | 1.4 | 1.4 | 16.9 | 1.8 | 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 | 0.4 | 13.5 | 1.9 | 1.2 | 5.4 | 1.6 | 5.7 | 4.8 | 5.0 | 7.3 | 6.0 | 6.3 |
| LnGrp Delay(d),s/veh | 62.6 | 33.4 | 17.7 | 58.4 | 19.0 | 16.5 | 43.3 | 28.4 | 28.4 | 48.6 | 28.3 | 28.3 |
| LnGrp LOS | E | C | B | E | B | B | D | C | C | D | C | C |
| Approach Vol, veh/h | | 1285 | | | 1117 | | | 947 | | | 1167 | |
| Approach Delay, s/veh | | 32.2 | | | 20.2 | | | 35.6 | | | 37.9 | |
| Approach LOS | | C | | | C | | | D | | | 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 | 18.0 | 22.1 | 6.4 | 32.2 | 16.3 | 23.7 | 4.9 | 33.7 |
| 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 | 14.0 | 27.0 | 4.0 | 29.0 | 13.0 | 28.0 | 4.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 11.6 | 3.8 | 26.4 | 12.2 | 14.0 | 2.5 | 13.5 |
| Green Ext Time (p_c), s | 0.0 | 5.7 | 0.0 | 1.8 | 0.2 | 5.4 | 0.0 | 11.5 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 31.4 |
| HCM 2010 LOS | | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 410 | 130 | 350 | 205 | 350 | 130 | 1960 | 420 | 380 | 1880 | 50 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 125 | 427 | 0 | 365 | 214 | 0 | 135 | 2042 | 0 | 396 | 1958 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 174 | 634 | 198 | 406 | 1008 | 314 | 183 | 2403 | 748 | 442 | 2816 | 877 |
| Arrive On Green | 0.05 | 0.12 | 0.00 | 0.12 | 0.20 | 0.00 | 0.05 | 0.47 | 0.00 | 0.13 | 0.55 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 125 | 427 | 0 | 365 | 214 | 0 | 135 | 2042 | 0 | 396 | 1958 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 4.9 | 10.9 | 0.0 | 14.2 | 4.8 | 0.0 | 5.2 | 48.0 | 0.0 | 15.4 | 37.9 | 0.0 |
| Cycle Q Clear(g_c), s | 4.9 | 10.9 | 0.0 | 14.2 | 4.8 | 0.0 | 5.2 | 48.0 | 0.0 | 15.4 | 37.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 174 | 634 | 198 | 406 | 1008 | 314 | 183 | 2403 | 748 | 442 | 2816 | 877 |
| V/C Ratio(X) | 0.72 | 0.67 | 0.00 | 0.90 | 0.21 | 0.00 | 0.74 | 0.85 | 0.00 | 0.90 | 0.70 | 0.00 |
| Avail Cap(c_a), veh/h | 264 | 1162 | 362 | 406 | 1402 | 437 | 221 | 2403 | 748 | 449 | 2816 | 877 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 63.5 | 56.7 | 0.0 | 59.0 | 45.5 | 0.0 | 63.3 | 31.5 | 0.0 | 58.2 | 22.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.1 | 2.1 | 0.0 | 21.8 | 0.2 | 0.0 | 7.4 | 4.0 | 0.0 | 19.4 | 1.4 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 5.2 | 0.0 | 8.0 | 2.3 | 0.0 | 2.7 | 23.2 | 0.0 | 8.5 | 18.0 | 0.0 |
| LnGrp Delay(d),s/veh | 65.5 | 58.9 | 0.0 | 80.8 | 45.7 | 0.0 | 70.7 | 35.5 | 0.0 | 77.6 | 23.4 | 0.0 |
| LnGrp LOS | E | E | | F | D | | E | D | | E | C | |
| Approach Vol, veh/h | | 552 | | | 579 | | | 2177 | | | 2354 | |
| Approach Delay, s/veh | | 60.4 | | | 67.8 | | | 37.7 | | | 32.5 | |
| Approach LOS | | E | | | 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 | 37.1 | 69.4 | 11.3 | 32.2 | 11.7 | 94.8 | 21.3 | 22.2 |
| Change Period (Y+Rc), s | 5.3 | * 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 5.3 | * 5.3 |
| Max Green Setting (Gmax), s | 17.7 | * 64 | 10.4 | 37.4 | 8.7 | 73.9 | 16.0 | * 31 |
| Max Q Clear Time (g_c+I1), s | 17.4 | 50.0 | 6.9 | 6.8 | 7.2 | 39.9 | 16.2 | 12.9 |
| Green Ext Time (p_c), s | 0.1 | 13.6 | 0.1 | 2.5 | 0.0 | 30.9 | 0.0 | 3.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 40.8 |
| HCM 2010 LOS | | D |

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 30 | 150 | 10 | 20 | 20 | 100 | 1050 | 60 | 20 | 780 | 130 |
| 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 130 | 33 | 38 | 11 | 22 | 2 | 109 | 1141 | 57 | 22 | 848 | 109 |
| Adj No. of Lanes | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 258 | 465 | 394 | 0 | 131 | 12 | 139 | 2175 | 109 | 38 | 1742 | 223 |
| Arrive On Green | 0.08 | 0.25 | 0.25 | 0.00 | 0.08 | 0.08 | 0.08 | 0.44 | 0.44 | 0.02 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3442 | 1863 | 1580 | 0 | 1682 | 153 | 1774 | 4959 | 248 | 1774 | 4564 | 584 |
| Grp Volume(v), veh/h | 130 | 33 | 38 | 0 | 0 | 24 | 109 | 780 | 418 | 22 | 629 | 328 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1580 | 0 | 0 | 1835 | 1774 | 1695 | 1817 | 1774 | 1695 | 1758 |
| Q Serve(g_s), s | 1.5 | 0.6 | 0.8 | 0.0 | 0.0 | 0.5 | 2.5 | 6.9 | 6.9 | 0.5 | 5.8 | 5.9 |
| Cycle Q Clear(g_c), s | 1.5 | 0.6 | 0.8 | 0.0 | 0.0 | 0.5 | 2.5 | 6.9 | 6.9 | 0.5 | 5.8 | 5.9 |
| Prop In Lane | 1.00 | | 1.00 | 0.00 | | 0.08 | 1.00 | | 0.14 | 1.00 | | 0.33 |
| Lane Grp Cap(c), veh/h | 258 | 465 | 394 | 0 | 0 | 143 | 139 | 1487 | 797 | 38 | 1294 | 671 |
| V/C Ratio(X) | 0.50 | 0.07 | 0.10 | 0.00 | 0.00 | 0.17 | 0.78 | 0.52 | 0.52 | 0.57 | 0.49 | 0.49 |
| Avail Cap(c_a), veh/h | 333 | 901 | 764 | 0 | 0 | 888 | 300 | 1722 | 923 | 172 | 1476 | 766 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.4 | 11.9 | 11.9 | 0.0 | 0.0 | 17.8 | 18.7 | 8.5 | 8.5 | 20.0 | 9.7 | 9.7 |
| Incr Delay (d2), s/veh | 1.5 | 0.1 | 0.1 | 0.0 | 0.0 | 0.6 | 9.2 | 0.3 | 0.5 | 12.8 | 0.3 | 0.6 |
| 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 | 0.8 | 0.3 | 0.3 | 0.0 | 0.0 | 0.3 | 1.6 | 3.2 | 3.5 | 0.4 | 2.8 | 2.9 |
| LnGrp Delay(d),s/veh | 19.9 | 11.9 | 12.0 | 0.0 | 0.0 | 18.4 | 27.9 | 8.7 | 9.0 | 32.9 | 10.0 | 10.3 |
| LnGrp LOS | B | B | B | | | B | C | A | A | C | A | B |
| Approach Vol, veh/h | | 201 | | | 24 | | | 1307 | | | 979 | |
| Approach Delay, s/veh | | 17.1 | | | 18.4 | | | 10.4 | | | 10.6 | |
| Approach LOS | | B | | | B | | | 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 | 4.9 | 22.1 | 0.0 | 14.3 | 7.2 | 19.8 | 7.1 | 7.2 |
| 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 | 21.0 | 4.0 | 20.0 | 7.0 | 18.0 | 4.0 | 20.0 |
| Max Q Clear Time (g_c+I1), s | 2.5 | 8.9 | 0.0 | 2.8 | 4.5 | 7.9 | 3.5 | 2.5 |
| Green Ext Time (p_c), s | 0.0 | 9.0 | 0.0 | 0.3 | 0.0 | 7.8 | 0.0 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 550 | 1090 | 170 | 30 | 690 | 60 | 300 | 80 | 70 | 90 | 30 | 260 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 598 | 1185 | 77 | 33 | 750 | 0 | 206 | 254 | 9 | 98 | 33 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 668 | 2474 | 769 | 62 | 1578 | 491 | 318 | 334 | 283 | 214 | 116 | 98 |
| Arrive On Green | 0.19 | 0.49 | 0.49 | 0.02 | 0.31 | 0.00 | 0.18 | 0.18 | 0.18 | 0.06 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1581 | 3442 | 5085 | 1583 | 1774 | 1863 | 1578 | 3442 | 1863 | 1583 |
| Grp Volume(v), veh/h | 598 | 1185 | 77 | 33 | 750 | 0 | 206 | 254 | 9 | 98 | 33 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1581 | 1721 | 1695 | 1583 | 1774 | 1863 | 1578 | 1721 | 1863 | 1583 |
| Q Serve(g_s), s | 12.7 | 11.7 | 2.0 | 0.7 | 8.9 | 0.0 | 8.1 | 9.7 | 0.4 | 2.1 | 1.3 | 0.0 |
| Cycle Q Clear(g_c), s | 12.7 | 11.7 | 2.0 | 0.7 | 8.9 | 0.0 | 8.1 | 9.7 | 0.4 | 2.1 | 1.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 668 | 2474 | 769 | 62 | 1578 | 491 | 318 | 334 | 283 | 214 | 116 | 98 |
| V/C Ratio(X) | 0.90 | 0.48 | 0.10 | 0.53 | 0.48 | 0.00 | 0.65 | 0.76 | 0.03 | 0.46 | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 668 | 2474 | 769 | 129 | 1668 | 519 | 784 | 823 | 697 | 1566 | 848 | 721 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 29.4 | 12.8 | 10.4 | 36.4 | 20.8 | 0.0 | 28.5 | 29.1 | 25.3 | 33.8 | 33.4 | 0.0 |
| Incr Delay (d2), s/veh | 14.3 | 0.4 | 0.1 | 2.6 | 0.6 | 0.0 | 0.8 | 1.4 | 0.0 | 0.6 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.3 | 5.5 | 0.9 | 0.4 | 4.3 | 0.0 | 4.0 | 5.1 | 0.2 | 1.0 | 0.7 | 0.0 |
| LnGrp Delay(d),s/veh | 43.6 | 13.2 | 10.5 | 39.0 | 21.4 | 0.0 | 29.3 | 30.5 | 25.3 | 34.4 | 33.9 | 0.0 |
| LnGrp LOS | D | B | B | D | C | | C | C | C | C | C | |
| Approach Vol, veh/h | | 1860 | | | 783 | | | 469 | | | 131 | |
| Approach Delay, s/veh | | 22.9 | | | 22.2 | | | 29.9 | | | 34.3 | |
| Approach LOS | | C | | | C | | | 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 | 5.8 | 41.8 | | 17.9 | 19.0 | 28.7 | | 9.1 |
| Change Period (Y+Rc), s | 4.5 | 5.5 | | 4.5 | 4.5 | 5.5 | | 4.5 |
| Max Green Setting (Gmax), s | 2.8 | 36.2 | | 33.0 | 14.5 | 24.5 | | 34.0 |
| Max Q Clear Time (g_c+I1), s | 2.7 | 13.7 | | 11.7 | 14.7 | 10.9 | | 4.1 |
| Green Ext Time (p_c), s | 0.0 | 19.9 | | 1.3 | 0.0 | 12.2 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 24.2 |
| HCM 2010 LOS | C |

| Notes |
|---|
| User approved pedestrian interval to be less than phase max green. |
| User approved volume balancing among the lanes for turning movement. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 190 | 830 | 880 | 590 | 410 | 470 | 810 | 1790 | 400 | 700 | 1450 | 220 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 198 | 865 | 612 | 615 | 427 | 0 | 844 | 1865 | 0 | 729 | 1510 | 0 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 244 | 1346 | 419 | 429 | 1613 | 502 | 681 | 1685 | 525 | 516 | 1414 | 440 |
| Arrive On Green | 0.07 | 0.26 | 0.26 | 0.12 | 0.32 | 0.00 | 0.20 | 0.33 | 0.00 | 0.15 | 0.28 | 0.00 |
| Sat Flow, veh/h | 3442 | 5085 | 1583 | 3477 | 5085 | 1583 | 3442 | 5085 | 1583 | 3442 | 5085 | 1583 |
| Grp Volume(v), veh/h | 198 | 865 | 612 | 615 | 427 | 0 | 844 | 1865 | 0 | 729 | 1510 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1583 | 1739 | 1695 | 1583 | 1721 | 1695 | 1583 | 1721 | 1695 | 1583 |
| Q Serve(g_s), s | 8.5 | 22.6 | 39.7 | 18.5 | 9.4 | 0.0 | 29.7 | 49.7 | 0.0 | 22.5 | 41.7 | 0.0 |
| Cycle Q Clear(g_c), s | 8.5 | 22.6 | 39.7 | 18.5 | 9.4 | 0.0 | 29.7 | 49.7 | 0.0 | 22.5 | 41.7 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 244 | 1346 | 419 | 429 | 1613 | 502 | 681 | 1685 | 525 | 516 | 1414 | 440 |
| V/C Ratio(X) | 0.81 | 0.64 | 1.46 | 1.43 | 0.26 | 0.00 | 1.24 | 1.11 | 0.00 | 1.41 | 1.07 | 0.00 |
| Avail Cap(c_a), veh/h | 333 | 1346 | 419 | 429 | 1613 | 502 | 681 | 1685 | 525 | 516 | 1414 | 440 |
| 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 | 0.00 | 0.24 | 0.24 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 68.7 | 48.9 | 55.2 | 65.8 | 38.2 | 0.0 | 60.2 | 50.2 | 0.0 | 63.8 | 54.2 | 0.0 |
| Incr Delay (d2), s/veh | 7.5 | 1.6 | 220.0 | 208.3 | 0.3 | 0.0 | 110.5 | 50.6 | 0.0 | 196.7 | 44.4 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 10.8 | 43.0 | 21.3 | 4.4 | 0.0 | 24.6 | 31.1 | 0.0 | 24.8 | 25.3 | 0.0 |
| LnGrp Delay(d),s/veh | 76.2 | 50.5 | 275.2 | 274.1 | 38.4 | 0.0 | 170.7 | 100.7 | 0.0 | 260.5 | 98.6 | 0.0 |
| LnGrp LOS | E | D | F | F | D | | F | F | | F | F | |
| Approach Vol, veh/h | | 1675 | | | 1042 | | | 2709 | | | 2239 | |
| Approach Delay, s/veh | | 135.6 | | | 177.5 | | | 122.5 | | | 151.3 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| 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 | 27.0 | 55.0 | 15.1 | 52.9 | 35.0 | 47.0 | 23.0 | 45.0 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 5.3 | * 5.3 | 4.5 | 5.3 |
| Max Green Setting (Gmax), s | 22.5 | 49.7 | 14.5 | 43.7 | 29.7 | * 42 | 18.5 | 39.7 |
| Max Q Clear Time (g_c+I1), s | 24.5 | 51.7 | 10.5 | 11.4 | 31.7 | 43.7 | 20.5 | 41.7 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 25.5 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 141.3 |
| HCM 2010 LOS | | F |

Notes

User approved ignoring U-Turning movement.

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 150 | 830 | 680 | 60 | 480 | 230 | 640 | 920 | 200 | 240 | 550 | 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 | | 0.98 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 156 | 865 | 599 | 62 | 500 | 197 | 667 | 958 | 108 | 250 | 573 | 18 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 179 | 767 | 516 | 51 | 758 | 297 | 570 | 1562 | 485 | 304 | 799 | 248 |
| Arrive On Green | 0.10 | 0.38 | 0.38 | 0.03 | 0.31 | 0.31 | 0.32 | 0.31 | 0.31 | 0.17 | 0.16 | 0.16 |
| Sat Flow, veh/h | 1774 | 2027 | 1363 | 1774 | 2474 | 969 | 1774 | 5085 | 1580 | 1774 | 5085 | 1577 |
| Grp Volume(v), veh/h | 156 | 752 | 712 | 62 | 357 | 340 | 667 | 958 | 108 | 250 | 573 | 18 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1620 | 1774 | 1770 | 1674 | 1774 | 1695 | 1580 | 1774 | 1695 | 1577 |
| Q Serve(g_s), s | 12.1 | 53.0 | 53.0 | 4.0 | 24.5 | 24.8 | 45.0 | 22.5 | 6.2 | 19.0 | 15.0 | 1.4 |
| Cycle Q Clear(g_c), s | 12.1 | 53.0 | 53.0 | 4.0 | 24.5 | 24.8 | 45.0 | 22.5 | 6.2 | 19.0 | 15.0 | 1.4 |
| Prop In Lane | 1.00 | | 0.84 | 1.00 | | 0.58 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 179 | 670 | 613 | 51 | 542 | 513 | 570 | 1562 | 485 | 304 | 799 | 248 |
| V/C Ratio(X) | 0.87 | 1.12 | 1.16 | 1.22 | 0.66 | 0.66 | 1.17 | 0.61 | 0.22 | 0.82 | 0.72 | 0.07 |
| Avail Cap(c_a), veh/h | 190 | 670 | 613 | 51 | 542 | 513 | 570 | 1562 | 485 | 304 | 799 | 248 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 62.0 | 43.5 | 43.5 | 68.0 | 42.2 | 42.3 | 47.5 | 41.4 | 27.7 | 55.9 | 56.0 | 50.3 |
| Incr Delay (d2), s/veh | 31.6 | 73.6 | 89.6 | 198.8 | 2.9 | 3.2 | 94.0 | 1.8 | 1.1 | 21.5 | 5.5 | 0.6 |
| 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 | 7.5 | 39.6 | 38.9 | 4.8 | 12.4 | 11.9 | 36.9 | 10.8 | 3.0 | 11.1 | 7.4 | 0.6 |
| LnGrp Delay(d),s/veh | 93.6 | 117.1 | 133.1 | 266.8 | 45.1 | 45.5 | 141.5 | 43.2 | 28.8 | 77.5 | 61.5 | 50.9 |
| LnGrp LOS | F | F | F | F | D | D | F | D | C | E | E | D |
| Approach Vol, veh/h | | 1620 | | | 759 | | | 1733 | | | 841 | |
| Approach Delay, s/veh | | 121.9 | | | 63.4 | | | 80.2 | | | 66.0 | |
| Approach LOS | | F | | | E | | | F | | | E | |

| 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 | 28.0 | 47.0 | 8.0 | 57.0 | 49.0 | 26.0 | 18.1 | 46.9 |
| 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 | 24.0 | 43.0 | 4.0 | 53.0 | 45.0 | 22.0 | 15.0 | 42.0 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 24.5 | 6.0 | 55.0 | 47.0 | 17.0 | 14.1 | 26.8 |
| Green Ext Time (p_c), s | 1.3 | 6.3 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 11.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 88.8 |
| HCM 2010 LOS | | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 350 | 0 | 2650 | 130 | 200 | 1950 | 770 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | | 5.0 | | 5.3 | 5.3 | 5.0 | 4.0 | 4.0 |
| Lane Util. Factor | | | | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | 0.86 |
| Frt | | | | | | 0.86 | | 1.00 | 0.85 | 1.00 | 0.99 | 0.85 |
| Flt Protected | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4751 | 1362 |
| Flt Permitted | | | | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | | 1611 | | 5085 | 1583 | 1770 | 4751 | 1362 |
| Peak-hour factor, 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 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 365 | 0 | 2760 | 135 | 208 | 2031 | 802 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 40 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 290 | 0 | 2760 | 95 | 208 | 2199 | 634 |
| Turn Type | | | | | | pt+ov | | NA | Perm | Prot | NA | Perm |
| Protected Phases | | | | | | 1 3 | | 2 4 | | 1 3 | Free | |
| Permitted Phases | | | | | | 1 3 | | | 2 4 | | | Free |
| Actuated Green, G (s) | | | | | | 17.0 | | 52.4 | 52.4 | 17.0 | 90.0 | 90.0 |
| Effective Green, g (s) | | | | | | 17.0 | | 52.4 | 52.4 | 17.0 | 90.0 | 90.0 |
| Actuated g/C Ratio | | | | | | 0.19 | | 0.58 | 0.58 | 0.19 | 1.00 | 1.00 |
| Clearance Time (s) | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Lane Grp Cap (vph) | | | | | | 304 | | 2960 | 921 | 334 | 4751 | 1362 |
| v/s Ratio Prot | | | | | | c0.18 | | c0.54 | | 0.12 | 0.46 | |
| v/s Ratio Perm | | | | | | | | | 0.06 | | | c0.47 |
| v/c Ratio | | | | | | 0.96 | | 0.93 | 0.10 | 0.62 | 0.46 | 0.47 |
| Uniform Delay, d1 | | | | | | 36.1 | | 17.2 | 8.4 | 33.6 | 0.0 | 0.0 |
| Progression Factor | | | | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | | 39.1 | | 6.6 | 0.1 | 2.6 | 0.3 | 1.1 |
| Delay (s) | | | | | | 75.2 | | 23.8 | 8.5 | 36.1 | 0.3 | 1.1 |
| Level of Service | | | | | | E | | C | A | D | A | A |
| Approach Delay (s) | | 0.0 | | | 75.2 | | | 23.1 | | | 2.9 | |
| Approach LOS | | A | | | E | | | C | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.96 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 20.6 |
| Intersection Capacity Utilization | 81.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 410 | 500 | 2280 | 400 | 0 | 1950 |
| Number | 3 | 18 | 2 | 12 | 1 | 6 |
| 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 | 0 | 1863 |
| Adj Flow Rate, veh/h | 427 | 519 | 2375 | 0 | 0 | 2031 |
| Adj No. of Lanes | 2 | 2 | 3 | 1 | 0 | 3 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 0 | 2 |
| Cap, veh/h | 813 | 658 | 3073 | 957 | 0 | 3073 |
| Arrive On Green | 0.24 | 0.24 | 1.00 | 0.00 | 0.00 | 0.60 |
| Sat Flow, veh/h | 3442 | 2787 | 5253 | 1583 | 0 | 5421 |
| Grp Volume(v), veh/h | 427 | 519 | 2375 | 0 | 0 | 2031 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1393 | 1695 | 1583 | 0 | 1695 |
| Q Serve(g_s), s | 6.5 | 10.5 | 0.0 | 0.0 | 0.0 | 15.8 |
| Cycle Q Clear(g_c), s | 6.5 | 10.5 | 0.0 | 0.0 | 0.0 | 15.8 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.00 | |
| Lane Grp Cap(c), veh/h | 813 | 658 | 3073 | 957 | 0 | 3073 |
| V/C Ratio(X) | 0.53 | 0.79 | 0.77 | 0.00 | 0.00 | 0.66 |
| Avail Cap(c_a), veh/h | 1371 | 1110 | 3073 | 957 | 0 | 3073 |
| HCM Platoon Ratio | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.64 | 0.00 | 0.00 | 0.88 |
| Uniform Delay (d), s/veh | 20.1 | 21.6 | 0.0 | 0.0 | 0.0 | 7.8 |
| Incr Delay (d2), s/veh | 0.2 | 0.8 | 1.3 | 0.0 | 0.0 | 1.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 4.1 | 0.4 | 0.0 | 0.0 | 7.6 |
| LnGrp Delay(d),s/veh | 20.3 | 22.4 | 1.3 | 0.0 | 0.0 | 8.9 |
| LnGrp LOS | C | C | A | | | A |
| Approach Vol, veh/h | 946 | | 2375 | | | 2031 |
| Approach Delay, s/veh | 21.4 | | 1.3 | | | 8.9 |
| Approach LOS | C | | A | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 51.5 | | | | 51.5 | | 18.5 |
| Change Period (Y+Rc), s | | 5.3 | | | | 5.3 | | 4.3 |
| Max Green Setting (Gmax), s | | 36.4 | | | | 36.4 | | 24.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | | 17.8 | | 12.5 |
| Green Ext Time (p_c), s | | 30.4 | | | | 17.3 | | 1.7 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 7.7 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 840 | 0 | 600 | 0 | 0 | 0 | 0 | 1840 | 880 | 0 | 1520 | 840 |
| 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 | 848 | 0 | 581 | | | | 0 | 1859 | 0 | 0 | 1535 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1034 | 0 | 837 | | | | 0 | 2781 | 866 | 0 | 2781 | 866 |
| Arrive On Green | 0.30 | 0.00 | 0.30 | | | | 0.00 | 0.55 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 848 | 0 | 581 | | | | 0 | 1859 | 0 | 0 | 1535 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 14.4 | 0.0 | 11.6 | | | | 0.0 | 16.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.4 | 0.0 | 11.6 | | | | 0.0 | 16.4 | 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 | 1034 | 0 | 837 | | | | 0 | 2781 | 866 | 0 | 2781 | 866 |
| V/C Ratio(X) | 0.82 | 0.00 | 0.69 | | | | 0.00 | 0.67 | 0.00 | 0.00 | 0.55 | 0.00 |
| Avail Cap(c_a), veh/h | 1423 | 0 | 1152 | | | | 0 | 2781 | 866 | 0 | 2781 | 866 |
| 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 | 0.74 | 0.00 |
| Uniform Delay (d), s/veh | 20.4 | 0.0 | 19.4 | | | | 0.0 | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.0 | 0.0 | 0.4 | | | | 0.0 | 1.3 | 0.0 | 0.0 | 0.6 | 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 |
| %ile BackOfQ(50%),veh/ln | 7.1 | 0.0 | 4.5 | | | | 0.0 | 7.9 | 0.0 | 0.0 | 0.2 | 0.0 |
| LnGrp Delay(d),s/veh | 22.4 | 0.0 | 19.9 | | | | 0.0 | 11.5 | 0.0 | 0.0 | 0.6 | 0.0 |
| LnGrp LOS | C | | B | | | | | B | | | A | |
| Approach Vol, veh/h | | 1429 | | | | | | 1859 | | | 1535 | |
| Approach Delay, s/veh | | 21.4 | | | | | | 11.5 | | | 0.6 | |
| Approach LOS | | C | | | | | | B | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 46.8 | | 23.2 | | 46.8 | | |
| Change Period (Y+Rc), s | | 5.3 | | * 4.3 | | 5.3 | | |
| Max Green Setting (Gmax), s | | 34.4 | | * 26 | | 34.4 | | |
| Max Q Clear Time (g_c+I1), s | | 18.4 | | 16.4 | | 2.0 | | |
| Green Ext Time (p_c), s | | 13.2 | | 2.5 | | 23.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.9 |
| HCM 2010 LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

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

# 9: El Dorado Hills Blvd & U.S. 50 West Bound Ramp

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 40 | 450 | 110 | 80 | 200 | 630 | 1650 | 310 | 180 | 1000 | 430 |
| 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 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 112 | 55 | 162 | 70 | 141 | 16 | 643 | 1684 | 287 | 184 | 1020 | 204 |
| Adj No. of Lanes | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 153 | 75 | 200 | 190 | 352 | 39 | 718 | 2002 | 339 | 209 | 2047 | 580 |
| Arrive On Green | 0.13 | 0.13 | 0.13 | 0.11 | 0.11 | 0.11 | 0.21 | 0.46 | 0.46 | 0.12 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1209 | 594 | 1583 | 1774 | 3292 | 368 | 3442 | 4379 | 741 | 1774 | 5588 | 1583 |
| Grp Volume(v), veh/h | 167 | 0 | 162 | 70 | 79 | 78 | 643 | 1301 | 670 | 184 | 1020 | 204 |
| Grp Sat Flow(s),veh/h/ln | 1802 | 0 | 1583 | 1774 | 1863 | 1798 | 1721 | 1695 | 1730 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 8.3 | 0.0 | 9.3 | 3.4 | 3.7 | 3.8 | 17.0 | 31.6 | 32.0 | 9.5 | 13.2 | 8.8 |
| Cycle Q Clear(g_c), s | 8.3 | 0.0 | 9.3 | 3.4 | 3.7 | 3.8 | 17.0 | 31.6 | 32.0 | 9.5 | 13.2 | 8.8 |
| Prop In Lane | 0.67 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.43 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 228 | 0 | 200 | 190 | 199 | 192 | 718 | 1550 | 791 | 209 | 2047 | 580 |
| V/C Ratio(X) | 0.73 | 0.00 | 0.81 | 0.37 | 0.40 | 0.41 | 0.90 | 0.84 | 0.85 | 0.88 | 0.50 | 0.35 |
| Avail Cap(c_a), veh/h | 355 | 0 | 312 | 190 | 199 | 192 | 811 | 1550 | 791 | 209 | 2047 | 580 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.3 | 0.0 | 39.7 | 38.8 | 38.9 | 38.9 | 36.0 | 22.3 | 22.5 | 40.6 | 22.9 | 21.5 |
| Incr Delay (d2), s/veh | 1.7 | 0.0 | 4.2 | 0.4 | 0.5 | 0.5 | 10.8 | 5.6 | 10.9 | 31.4 | 0.9 | 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 | 4.2 | 0.0 | 4.3 | 1.7 | 1.9 | 1.9 | 9.1 | 15.9 | 17.6 | 6.5 | 7.0 | 4.1 |
| LnGrp Delay(d),s/veh | 41.0 | 0.0 | 43.9 | 39.2 | 39.4 | 39.4 | 46.8 | 28.0 | 33.4 | 71.9 | 23.8 | 23.2 |
| LnGrp LOS | D | | D | D | D | D | D | C | C | E | C | C |
| Approach Vol, veh/h | | 329 | | | 227 | | | 2614 | | | 1408 | |
| Approach Delay, s/veh | | 42.4 | | | 39.3 | | | 34.0 | | | 30.0 | |
| Approach LOS | | D | | | D | | | 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 | 15.0 | 54.6 | | 16.4 | 23.5 | 46.1 | | 14.0 |
| Change Period (Y+Rc), s | 4.0 | 5.3 | | 4.6 | 4.0 | 5.3 | | 4.0 |
| Max Green Setting (Gmax), s | 11.0 | 42.7 | | 18.4 | 22.0 | 31.7 | | 10.0 |
| Max Q Clear Time (g_c+I1), s | 11.5 | 34.0 | | 11.3 | 19.0 | 15.2 | | 5.8 |
| Green Ext Time (p_c), s | 0.0 | 7.9 | | 0.5 | 0.5 | 14.2 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 33.6 |
| HCM 2010 LOS | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 560 | 0 | 0 | 580 | 0 | 2010 | 860 | 140 | 1420 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.6 | | | 4.0 | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 0.88 | | | 1.00 | | 0.91 | 1.00 | 1.00 | 0.86 | |
| Frpb, ped/bikes | | | 1.00 | | | 0.99 | | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | | 0.86 | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 2787 | | | 1591 | | 5085 | 1549 | 1770 | 6408 | |
| Flt Permitted | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 2787 | | | 1591 | | 5085 | 1549 | 1770 | 6408 | |
| Peak-hour factor, PHF | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Adj. Flow (vph) | 0 | 0 | 571 | 0 | 0 | 592 | 0 | 2051 | 878 | 143 | 1449 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 217 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 436 | 0 | 0 | 592 | 0 | 2051 | 661 | 143 | 1449 | 0 |
| Confl. Peds. (#/hr) | | | | | | 2 | | | 2 | | | |
| Turn Type | | | Prot | | | Free | | NA | Perm | Prot | NA | |
| Protected Phases | | | 5 | | | | | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | Free | | | 2 | | | |
| Actuated Green, G (s) | | | 13.0 | | | 50.0 | | 29.9 | 29.9 | 10.4 | 26.7 | |
| Effective Green, g (s) | | | 13.0 | | | 50.0 | | 29.9 | 29.9 | 10.4 | 26.7 | |
| Actuated g/C Ratio | | | 0.26 | | | 1.00 | | 0.60 | 0.60 | 0.21 | 0.53 | |
| Clearance Time (s) | | | 4.6 | | | | | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 1.0 | | | | | 1.0 | 1.0 | 2.5 | 1.0 | |
| Lane Grp Cap (vph) | | | 724 | | | 1591 | | 3040 | 926 | 368 | 3421 | |
| v/s Ratio Prot | | | 0.16 | | | | | 0.40 | | 0.08 | 0.23 | |
| v/s Ratio Perm | | | | | | c0.37 | | | c0.43 | | | |
| v/c Ratio | | | 0.60 | | | 0.37 | | 0.67 | 0.71 | 0.39 | 0.42 | |
| Uniform Delay, d1 | | | 16.2 | | | 0.0 | | 6.8 | 7.1 | 17.1 | 7.0 | |
| Progression Factor | | | 1.00 | | | 1.00 | | 1.00 | 1.00 | 0.69 | 0.47 | |
| Incremental Delay, d2 | | | 1.0 | | | 0.7 | | 1.2 | 4.7 | 0.3 | 0.3 | |
| Delay (s) | | | 17.2 | | | 0.7 | | 8.0 | 11.7 | 12.1 | 3.6 | |
| Level of Service | | | B | | | A | | A | B | B | A | |
| Approach Delay (s) | | 17.2 | | | 0.7 | | | 9.1 | | | 4.3 | |
| Approach LOS | | B | | | A | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 7.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 10.3 |
| Intersection Capacity Utilization | 74.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 670 | 930 | 0 | 0 | 730 | 100 | 10 | 10 | 10 | 280 | 0 | 610 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 698 | 969 | 0 | 0 | 760 | 20 | 10 | 10 | 1 | 292 | 0 | 94 |
| Adj No. of Lanes | 2 | 2 | 1 | 1 | 3 | 1 | 0 | 2 | 1 | 2 | 0 | 2 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 866 | 2152 | 963 | 3 | 1493 | 464 | 122 | 122 | 108 | 477 | 0 | 424 |
| Arrive On Green | 0.25 | 0.61 | 0.00 | 0.00 | 0.29 | 0.29 | 0.07 | 0.07 | 0.07 | 0.13 | 0.00 | 0.13 |
| Sat Flow, veh/h | 3442 | 3539 | 1583 | 1774 | 5085 | 1580 | 1774 | 1770 | 1570 | 3548 | 0 | 3153 |
| Grp Volume(v), veh/h | 698 | 969 | 0 | 0 | 760 | 20 | 10 | 10 | 1 | 292 | 0 | 94 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1770 | 1583 | 1774 | 1695 | 1580 | 1774 | 1770 | 1570 | 1774 | 0 | 1576 |
| Q Serve(g_s), s | 12.1 | 9.4 | 0.0 | 0.0 | 7.9 | 0.6 | 0.3 | 0.3 | 0.0 | 4.9 | 0.0 | 1.7 |
| Cycle Q Clear(g_c), s | 12.1 | 9.4 | 0.0 | 0.0 | 7.9 | 0.6 | 0.3 | 0.3 | 0.0 | 4.9 | 0.0 | 1.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 866 | 2152 | 963 | 3 | 1493 | 464 | 122 | 122 | 108 | 477 | 0 | 424 |
| V/C Ratio(X) | 0.81 | 0.45 | 0.00 | 0.00 | 0.51 | 0.04 | 0.08 | 0.08 | 0.01 | 0.61 | 0.00 | 0.22 |
| Avail Cap(c_a), veh/h | 1297 | 2446 | 1094 | 111 | 1917 | 596 | 752 | 751 | 666 | 1616 | 0 | 1436 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.4 | 6.7 | 0.0 | 0.0 | 18.7 | 16.1 | 27.7 | 27.7 | 27.6 | 26.0 | 0.0 | 24.6 |
| Incr Delay (d2), s/veh | 2.3 | 0.1 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 | 0.3 | 0.0 | 1.3 | 0.0 | 0.3 |
| 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 | 4.6 | 0.0 | 0.0 | 3.7 | 0.3 | 0.2 | 0.2 | 0.0 | 2.5 | 0.0 | 0.7 |
| LnGrp Delay(d),s/veh | 24.7 | 6.9 | 0.0 | 0.0 | 18.9 | 16.1 | 28.0 | 28.0 | 27.6 | 27.3 | 0.0 | 24.8 |
| LnGrp LOS | C | A | | | B | B | C | C | C | C | | C |
| Approach Vol, veh/h | | 1667 | | | 780 | | | 21 | | | 386 | |
| Approach Delay, s/veh | | 14.3 | | | 18.9 | | | 28.0 | | | 26.7 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | 3 | 4 | | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | | 8.4 | 0.0 | 42.7 | | 12.6 | 20.0 | 22.7 |
| Change Period (Y+Rc), s | | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 |
| Max Green Setting (Gmax), s | | 27.0 | 4.0 | 44.0 | | 29.0 | 24.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | | 2.3 | 0.0 | 11.4 | | 6.9 | 14.1 | 9.9 |
| Green Ext Time (p_c), s | | 0.0 | 0.0 | 13.7 | | 1.3 | 1.9 | 8.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.3 |
| HCM 2010 LOS | B |

| Notes |
|---|
| User approved volume balancing among the lanes for turning movement. |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 50 | 1160 | 10 | 10 | 770 | 660 | 10 | 10 | 10 | 450 | 20 | 50 |
| 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 | | 0.99 | 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 | 1863 | 1900 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 53 | 1234 | 10 | 11 | 819 | 214 | 11 | 11 | 1 | 479 | 21 | 22 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 3 | 1 | 0 | 1 | 0 | 2 | 1 | 0 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 67 | 1762 | 14 | 20 | 2354 | 731 | 0 | 122 | 11 | 619 | 262 | 274 |
| Arrive On Green | 0.04 | 0.49 | 0.49 | 0.01 | 0.46 | 0.46 | 0.00 | 0.07 | 0.07 | 0.18 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1774 | 3598 | 29 | 1774 | 5085 | 1580 | 0 | 1681 | 153 | 3442 | 833 | 873 |
| Grp Volume(v), veh/h | 53 | 607 | 637 | 11 | 819 | 214 | 0 | 0 | 12 | 479 | 0 | 43 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1858 | 1774 | 1695 | 1580 | 0 | 0 | 1834 | 1721 | 0 | 1707 |
| Q Serve(g_s), s | 1.9 | 17.3 | 17.3 | 0.4 | 6.7 | 5.5 | 0.0 | 0.0 | 0.4 | 8.6 | 0.0 | 1.1 |
| Cycle Q Clear(g_c), s | 1.9 | 17.3 | 17.3 | 0.4 | 6.7 | 5.5 | 0.0 | 0.0 | 0.4 | 8.6 | 0.0 | 1.1 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 0.00 | | 0.08 | 1.00 | | 0.51 |
| Lane Grp Cap(c), veh/h | 67 | 867 | 910 | 20 | 2354 | 731 | 0 | 0 | 133 | 619 | 0 | 536 |
| V/C Ratio(X) | 0.79 | 0.70 | 0.70 | 0.56 | 0.35 | 0.29 | 0.00 | 0.00 | 0.09 | 0.77 | 0.00 | 0.08 |
| Avail Cap(c_a), veh/h | 246 | 1038 | 1090 | 110 | 2591 | 805 | 0 | 0 | 680 | 956 | 0 | 1001 |
| 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 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.9 | 12.8 | 12.8 | 31.9 | 11.1 | 10.8 | 0.0 | 0.0 | 28.1 | 25.3 | 0.0 | 15.6 |
| Incr Delay (d2), s/veh | 18.0 | 1.7 | 1.6 | 22.5 | 0.1 | 0.2 | 0.0 | 0.0 | 0.3 | 2.1 | 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 | 1.3 | 8.7 | 9.1 | 0.3 | 3.1 | 2.4 | 0.0 | 0.0 | 0.2 | 4.2 | 0.0 | 0.5 |
| LnGrp Delay(d),s/veh | 48.9 | 14.5 | 14.4 | 54.4 | 11.2 | 11.0 | 0.0 | 0.0 | 28.3 | 27.4 | 0.0 | 15.7 |
| LnGrp LOS | D | B | B | D | B | B | | | C | C | | B |
| Approach Vol, veh/h | | 1297 | | | 1044 | | | 12 | | | 522 | |
| Approach Delay, s/veh | | 15.9 | | | 11.6 | | | 28.3 | | | 26.5 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 15.7 | 8.7 | 4.7 | 35.7 | 0.0 | 24.3 | 6.5 | 34.0 |
| 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 | 18.0 | 24.0 | 4.0 | 38.0 | 4.0 | 38.0 | 9.0 | 33.0 |
| Max Q Clear Time (g_c+I1), s | 10.6 | 2.4 | 2.4 | 19.3 | 0.0 | 3.1 | 3.9 | 8.7 |
| Green Ext Time (p_c), s | 1.1 | 0.2 | 0.0 | 12.5 | 0.0 | 0.2 | 0.0 | 14.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 740 | 320 | 130 | 210 | 270 | 130 | 190 | 1500 | 360 | 180 | 620 | 380 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 804 | 348 | 67 | 228 | 293 | -19 | 207 | 1630 | 120 | 196 | 674 | 147 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 2 | 1 | 1 | 4 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 633 | 1104 | 206 | 308 | 574 | 257 | 192 | 2570 | 634 | 275 | 1896 | 589 |
| Arrive On Green | 0.18 | 0.26 | 0.26 | 0.09 | 0.16 | 0.00 | 0.11 | 0.40 | 0.40 | 0.08 | 0.37 | 0.37 |
| Sat Flow, veh/h | 3442 | 4306 | 803 | 3442 | 3539 | 1583 | 1774 | 6408 | 1581 | 3442 | 5085 | 1581 |
| Grp Volume(v), veh/h | 804 | 272 | 143 | 228 | 293 | -19 | 207 | 1630 | 120 | 196 | 674 | 147 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1719 | 1721 | 1770 | 1583 | 1774 | 1602 | 1581 | 1721 | 1695 | 1581 |
| Q Serve(g_s), s | 17.0 | 6.0 | 6.3 | 6.0 | 7.0 | 0.0 | 10.0 | 18.9 | 4.5 | 5.1 | 8.9 | 5.9 |
| Cycle Q Clear(g_c), s | 17.0 | 6.0 | 6.3 | 6.0 | 7.0 | 0.0 | 10.0 | 18.9 | 4.5 | 5.1 | 8.9 | 5.9 |
| Prop In Lane | 1.00 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 633 | 870 | 441 | 308 | 574 | 257 | 192 | 2570 | 634 | 275 | 1896 | 589 |
| V/C Ratio(X) | 1.27 | 0.31 | 0.33 | 0.74 | 0.51 | -0.07 | 1.08 | 0.63 | 0.19 | 0.71 | 0.36 | 0.25 |
| Avail Cap(c_a), veh/h | 633 | 1430 | 725 | 484 | 1339 | 599 | 192 | 2702 | 667 | 484 | 2310 | 718 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.7 | 27.8 | 27.9 | 41.0 | 35.4 | 0.0 | 41.2 | 22.2 | 18.0 | 41.5 | 21.0 | 20.1 |
| Incr Delay (d2), s/veh | 134.0 | 0.2 | 0.4 | 3.5 | 0.7 | 0.0 | 87.6 | 0.5 | 0.1 | 3.4 | 0.1 | 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 | 19.8 | 2.8 | 3.0 | 3.0 | 3.5 | 0.0 | 9.5 | 8.3 | 2.0 | 2.6 | 4.1 | 2.6 |
| LnGrp Delay(d),s/veh | 171.7 | 28.0 | 28.3 | 44.5 | 36.1 | 0.0 | 128.8 | 22.7 | 18.1 | 44.9 | 21.1 | 20.3 |
| LnGrp LOS | F | C | C | D | D | | F | C | B | D | C | C |
| Approach Vol, veh/h | | 1219 | | | 502 | | | 1957 | | | 1017 | |
| Approach Delay, s/veh | | 122.8 | | | 41.3 | | | 33.6 | | | 25.6 | |
| Approach LOS | | F | | | D | | | C | | | 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 | 11.4 | 41.1 | 12.3 | 27.7 | 14.0 | 38.5 | 21.0 | 19.0 |
| 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 | 13.0 | 39.0 | 13.0 | 39.0 | 10.0 | 42.0 | 17.0 | 35.0 |
| Max Q Clear Time (g_c+I1), s | 7.1 | 20.9 | 8.0 | 8.3 | 12.0 | 10.9 | 19.0 | 9.0 |
| Green Ext Time (p_c), s | 0.3 | 15.0 | 0.3 | 5.1 | 0.0 | 23.3 | 0.0 | 4.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 55.9 |
| HCM 2010 LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 60 | 1430 | 440 | 200 | 880 | 20 | 420 | 20 | 190 | 20 | 20 | 170 |
| Number | 1 | 6 | 16 | 5 | 2 | 12 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 65 | 1538 | 256 | 215 | 946 | 9 | 468 | 0 | 27 | 22 | 22 | 17 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 83 | 2156 | 671 | 249 | 2631 | 809 | 579 | 0 | 258 | 51 | 53 | 45 |
| Arrive On Green | 0.05 | 0.42 | 0.42 | 0.14 | 0.52 | 0.52 | 0.16 | 0.00 | 0.16 | 0.03 | 0.03 | 0.03 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1564 | 3548 | 0 | 1583 | 1774 | 1863 | 1583 |
| Grp Volume(v), veh/h | 65 | 1538 | 256 | 215 | 946 | 9 | 468 | 0 | 27 | 22 | 22 | 17 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1564 | 1774 | 0 | 1583 | 1774 | 1863 | 1583 |
| Q Serve(g_s), s | 3.0 | 20.5 | 9.1 | 9.7 | 9.0 | 0.2 | 10.4 | 0.0 | 1.2 | 1.0 | 1.0 | 0.9 |
| Cycle Q Clear(g_c), s | 3.0 | 20.5 | 9.1 | 9.7 | 9.0 | 0.2 | 10.4 | 0.0 | 1.2 | 1.0 | 1.0 | 0.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 83 | 2156 | 671 | 249 | 2631 | 809 | 579 | 0 | 258 | 51 | 53 | 45 |
| V/C Ratio(X) | 0.78 | 0.71 | 0.38 | 0.86 | 0.36 | 0.01 | 0.81 | 0.00 | 0.10 | 0.44 | 0.41 | 0.38 |
| Avail Cap(c_a), veh/h | 188 | 2265 | 705 | 249 | 2631 | 809 | 1646 | 0 | 734 | 844 | 887 | 754 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.6 | 19.5 | 16.2 | 34.4 | 11.7 | 9.6 | 33.1 | 0.0 | 29.2 | 39.1 | 39.1 | 39.1 |
| Incr Delay (d2), s/veh | 5.8 | 1.8 | 1.4 | 24.5 | 0.4 | 0.0 | 1.0 | 0.0 | 0.1 | 2.2 | 1.9 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 9.9 | 4.2 | 6.5 | 4.3 | 0.1 | 5.2 | 0.0 | 0.5 | 0.5 | 0.5 | 0.4 |
| LnGrp Delay(d),s/veh | 44.5 | 21.3 | 17.6 | 58.9 | 12.1 | 9.6 | 34.1 | 0.0 | 29.3 | 41.3 | 41.0 | 41.0 |
| LnGrp LOS | D | C | B | E | B | A | C | | C | D | D | D |
| Approach Vol, veh/h | | 1859 | | | 1170 | | | 495 | | | 61 | |
| Approach Delay, s/veh | | 21.6 | | | 20.7 | | | 33.8 | | | 41.1 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | 8.3 | 48.9 | | 6.8 | 16.0 | 41.2 | | 17.9 |
| Change Period (Y+Rc), s | 4.5 | 6.5 | | 4.5 | 4.5 | * 6.5 | | 4.5 |
| Max Green Setting (Gmax), s | 8.7 | 39.3 | | 39.0 | 11.5 | * 37 | | 38.0 |
| Max Q Clear Time (g_c+I1), s | 5.0 | 11.0 | | 3.0 | 11.7 | 22.5 | | 12.4 |
| Green Ext Time (p_c), s | 0.0 | 27.6 | | 0.1 | 0.0 | 12.3 | | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.3 |
| HCM 2010 LOS | C |

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.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 120 | 1330 | 190 | 50 | 780 | 130 | 230 | 30 | 90 | 130 | 20 | 90 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 122 | 1357 | 82 | 51 | 796 | 45 | 235 | 31 | 13 | 133 | 20 | 9 |
| Adj No. of Lanes | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 155 | 2395 | 746 | 79 | 2176 | 678 | 284 | 197 | 168 | 182 | 59 | 27 |
| Arrive On Green | 0.09 | 0.47 | 0.47 | 0.04 | 0.43 | 0.43 | 0.16 | 0.11 | 0.11 | 0.10 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1774 | 5085 | 1583 | 1774 | 5085 | 1583 | 1774 | 1863 | 1583 | 1774 | 1218 | 548 |
| Grp Volume(v), veh/h | 122 | 1357 | 82 | 51 | 796 | 45 | 235 | 31 | 13 | 133 | 0 | 29 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1695 | 1583 | 1774 | 1695 | 1583 | 1774 | 1863 | 1583 | 1774 | 0 | 1766 |
| Q Serve(g_s), s | 4.9 | 14.0 | 2.1 | 2.0 | 7.7 | 1.2 | 9.3 | 1.1 | 0.5 | 5.3 | 0.0 | 1.2 |
| Cycle Q Clear(g_c), s | 4.9 | 14.0 | 2.1 | 2.0 | 7.7 | 1.2 | 9.3 | 1.1 | 0.5 | 5.3 | 0.0 | 1.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.31 |
| Lane Grp Cap(c), veh/h | 155 | 2395 | 746 | 79 | 2176 | 678 | 284 | 197 | 168 | 182 | 0 | 86 |
| V/C Ratio(X) | 0.79 | 0.57 | 0.11 | 0.65 | 0.37 | 0.07 | 0.83 | 0.16 | 0.08 | 0.73 | 0.00 | 0.34 |
| Avail Cap(c_a), veh/h | 233 | 2492 | 776 | 122 | 2176 | 678 | 453 | 1054 | 896 | 331 | 0 | 877 |
| 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 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.4 | 13.8 | 10.7 | 34.1 | 14.1 | 12.2 | 29.5 | 29.4 | 29.2 | 31.5 | 0.0 | 33.3 |
| Incr Delay (d2), s/veh | 5.1 | 0.6 | 0.2 | 3.3 | 0.2 | 0.1 | 6.9 | 0.4 | 0.2 | 5.5 | 0.0 | 2.3 |
| 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 | 2.6 | 6.7 | 1.0 | 1.1 | 3.7 | 0.5 | 5.1 | 0.6 | 0.2 | 2.9 | 0.0 | 0.6 |
| LnGrp Delay(d),s/veh | 37.5 | 14.5 | 10.9 | 37.4 | 14.3 | 12.3 | 36.4 | 29.8 | 29.4 | 37.0 | 0.0 | 35.6 |
| LnGrp LOS | D | B | B | D | B | B | D | C | C | D | | D |
| Approach Vol, veh/h | | 1561 | | | 892 | | | 279 | | | 162 | |
| Approach Delay, s/veh | | 16.1 | | | 15.5 | | | 35.3 | | | 36.8 | |
| Approach LOS | | B | | | B | | | D | | | 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 | 7.7 | 40.6 | 16.1 | 8.0 | 10.8 | 37.5 | 11.9 | 12.2 |
| Change Period (Y+Rc), s | 4.5 | * 6.5 | 4.5 | 4.5 | 4.5 | 6.5 | 4.5 | 4.5 |
| Max Green Setting (Gmax), s | 5.0 | * 36 | 18.5 | 36.0 | 9.5 | 31.0 | 13.5 | 41.0 |
| Max Q Clear Time (g_c+I1), s | 4.0 | 16.0 | 11.3 | 3.2 | 6.9 | 9.7 | 7.3 | 3.1 |
| Green Ext Time (p_c), s | 0.0 | 18.2 | 0.4 | 0.3 | 0.0 | 19.7 | 0.2 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.9 |
| HCM 2010 LOS | B |

Notes

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 320 | 0 | 150 | 0 | 1460 | 360 | 0 | 550 | 980 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 333 | 0 | 96 | 0 | 1521 | 0 | 0 | 573 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 540 | 0 | 437 | 0 | 2370 | 1060 | 0 | 2370 | 1060 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.00 | 0.67 | 0.00 | 0.00 | 0.67 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 3632 | 1583 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | | | | 333 | 0 | 96 | 0 | 1521 | 0 | 0 | 573 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1770 | 1583 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | | | | 4.2 | 0.0 | 1.4 | 0.0 | 11.5 | 0.0 | 0.0 | 2.9 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 4.2 | 0.0 | 1.4 | 0.0 | 11.5 | 0.0 | 0.0 | 2.9 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 540 | 0 | 437 | 0 | 2370 | 1060 | 0 | 2370 | 1060 |
| V/C Ratio(X) | | | | 0.62 | 0.00 | 0.22 | 0.00 | 0.64 | 0.00 | 0.00 | 0.24 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 1194 | 0 | 967 | 0 | 3147 | 1408 | 0 | 3147 | 1408 |
| 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 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 18.1 | 0.0 | 17.0 | 0.0 | 4.4 | 0.0 | 0.0 | 3.0 | 0.0 |
| Incr Delay (d2), s/veh | | | | 1.2 | 0.0 | 0.3 | 0.0 | 0.3 | 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 | | | | 2.0 | 0.0 | 0.5 | 0.0 | 5.6 | 0.0 | 0.0 | 1.4 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 19.3 | 0.0 | 17.2 | 0.0 | 4.7 | 0.0 | 0.0 | 3.1 | 0.0 |
| LnGrp LOS | | | | B | | B | | A | | | A | |
| Approach Vol, veh/h | | | | | 429 | | | 1521 | | | 573 | |
| Approach Delay, s/veh | | | | | 18.8 | | | 4.7 | | | 3.1 | |
| 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 | | 34.9 | | | | 34.9 | | 11.2 |
| Change Period (Y+Rc), s | | 4.0 | | | | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | | 41.0 | | | | 41.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 13.5 | | | | 4.9 | | 6.2 |
| Green Ext Time (p_c), s | | 17.4 | | | | 20.5 | | 1.1 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 6.7 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 1030 | 0 | 280 | 0 | 0 | 0 | 0 | 790 | 320 | 0 | 710 | 160 |
| 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 | 1073 | 0 | 223 | | | | 0 | 823 | 0 | 0 | 740 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 2 | 1 | 0 | 2 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 1441 | 0 | 1167 | | | | 0 | 1346 | 602 | 0 | 1346 | 602 |
| Arrive On Green | 0.42 | 0.00 | 0.42 | | | | 0.00 | 0.38 | 0.00 | 0.00 | 0.38 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 3632 | 1583 | 0 | 3632 | 1583 |
| Grp Volume(v), veh/h | 1073 | 0 | 223 | | | | 0 | 823 | 0 | 0 | 740 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1770 | 1583 | 0 | 1770 | 1583 |
| Q Serve(g_s), s | 10.5 | 0.0 | 2.0 | | | | 0.0 | 7.5 | 0.0 | 0.0 | 6.5 | 0.0 |
| Cycle Q Clear(g_c), s | 10.5 | 0.0 | 2.0 | | | | 0.0 | 7.5 | 0.0 | 0.0 | 6.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1441 | 0 | 1167 | | | | 0 | 1346 | 602 | 0 | 1346 | 602 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.19 | | | | 0.00 | 0.61 | 0.00 | 0.00 | 0.55 | 0.00 |
| Avail Cap(c_a), veh/h | 2077 | 0 | 1682 | | | | 0 | 1602 | 717 | 0 | 1602 | 717 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 9.8 | 0.0 | 7.3 | | | | 0.0 | 10.0 | 0.0 | 0.0 | 9.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 0.1 | | | | 0.0 | 0.5 | 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 | 5.1 | 0.0 | 0.8 | | | | 0.0 | 3.6 | 0.0 | 0.0 | 3.1 | 0.0 |
| LnGrp Delay(d),s/veh | 10.6 | 0.0 | 7.4 | | | | 0.0 | 10.5 | 0.0 | 0.0 | 10.0 | 0.0 |
| LnGrp LOS | B | | A | | | | | B | | | B | |
| Approach Vol, veh/h | | 1296 | | | | | | 823 | | | 740 | |
| Approach Delay, s/veh | | 10.1 | | | | | | 10.5 | | | 10.0 | |
| Approach LOS | | B | | | | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 19.1 | | 20.6 | | 19.1 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 18.0 | | 24.0 | | 18.0 | | |
| Max Q Clear Time (g_c+I1), s | | 9.5 | | 12.5 | | 8.5 | | |
| Green Ext Time (p_c), s | | 5.7 | | 4.2 | | 6.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.2 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 0 | 0 | 0 | 240 | 0 | 490 | 0 | 1260 | 490 | 0 | 1190 | 100 |
| 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 | 0 | 1863 | 0 | 1863 | 1863 | 0 | 1863 | 1863 |
| Adj Flow Rate, veh/h | | | | 261 | 0 | 495 | 0 | 1370 | 0 | 0 | 1293 | 0 |
| Adj No. of Lanes | | | | 2 | 0 | 2 | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | | | | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | | | | 842 | 0 | 682 | 0 | 3126 | 973 | 0 | 3126 | 973 |
| Arrive On Green | | | | 0.24 | 0.00 | 0.24 | 0.00 | 0.61 | 0.00 | 0.00 | 0.61 | 0.00 |
| Sat Flow, veh/h | | | | 3442 | 0 | 2787 | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | | | | 261 | 0 | 495 | 0 | 1370 | 0 | 0 | 1293 | 0 |
| Grp Sat Flow(s),veh/h/ln | | | | 1721 | 0 | 1393 | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | | | | 3.5 | 0.0 | 9.3 | 0.0 | 8.1 | 0.0 | 0.0 | 7.5 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 3.5 | 0.0 | 9.3 | 0.0 | 8.1 | 0.0 | 0.0 | 7.5 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 842 | 0 | 682 | 0 | 3126 | 973 | 0 | 3126 | 973 |
| V/C Ratio(X) | | | | 0.31 | 0.00 | 0.73 | 0.00 | 0.44 | 0.00 | 0.00 | 0.41 | 0.00 |
| Avail Cap(c_a), veh/h | | | | 1632 | 0 | 1322 | 0 | 3126 | 973 | 0 | 3126 | 973 |
| 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 | 0.00 | 0.88 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 17.6 | 0.0 | 19.7 | 0.0 | 5.8 | 0.0 | 0.0 | 5.7 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.2 | 0.0 | 1.5 | 0.0 | 0.4 | 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 | | | | 1.7 | 0.0 | 3.7 | 0.0 | 3.8 | 0.0 | 0.0 | 3.6 | 0.0 |
| LnGrp Delay(d),s/veh | | | | 17.8 | 0.0 | 21.2 | 0.0 | 6.2 | 0.0 | 0.0 | 6.1 | 0.0 |
| LnGrp LOS | | | | B | | C | | A | | | A | |
| Approach Vol, veh/h | | | | | 756 | | | 1370 | | | 1293 | |
| Approach Delay, s/veh | | | | | 20.0 | | | 6.2 | | | 6.1 | |
| Approach LOS | | | | | C | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 52.1 | | | | 52.1 | | 17.9 |
| Change Period (Y+Rc), s | | 4.0 | | | | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | | 35.0 | | | | 35.0 | | 27.0 |
| Max Q Clear Time (g_c+I1), s | | 10.1 | | | | 9.5 | | 11.3 |
| Green Ext Time (p_c), s | | 19.4 | | | | 19.8 | | 2.6 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 9.2 |
| HCM 2010 LOS | | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 440 | 0 | 590 | 0 | 0 | 0 | 0 | 1310 | 150 | 0 | 860 | 570 |
| 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 | 478 | 0 | 529 | | | | 0 | 1424 | 0 | 0 | 935 | 0 |
| Adj No. of Lanes | 2 | 0 | 2 | | | | 0 | 3 | 1 | 0 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 0 | 2 | | | | 0 | 2 | 2 | 0 | 2 | 2 |
| Cap, veh/h | 921 | 0 | 746 | | | | 0 | 3047 | 949 | 0 | 3047 | 949 |
| Arrive On Green | 0.27 | 0.00 | 0.27 | | | | 0.00 | 0.60 | 0.00 | 0.00 | 0.60 | 0.00 |
| Sat Flow, veh/h | 3442 | 0 | 2787 | | | | 0 | 5253 | 1583 | 0 | 5253 | 1583 |
| Grp Volume(v), veh/h | 478 | 0 | 529 | | | | 0 | 1424 | 0 | 0 | 935 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 0 | 1393 | | | | 0 | 1695 | 1583 | 0 | 1695 | 1583 |
| Q Serve(g_s), s | 7.1 | 0.0 | 10.3 | | | | 0.0 | 9.4 | 0.0 | 0.0 | 5.4 | 0.0 |
| Cycle Q Clear(g_c), s | 7.1 | 0.0 | 10.3 | | | | 0.0 | 9.4 | 0.0 | 0.0 | 5.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 921 | 0 | 746 | | | | 0 | 3047 | 949 | 0 | 3047 | 949 |
| V/C Ratio(X) | 0.52 | 0.00 | 0.71 | | | | 0.00 | 0.47 | 0.00 | 0.00 | 0.31 | 0.00 |
| Avail Cap(c_a), veh/h | 1776 | 0 | 1438 | | | | 0 | 3047 | 949 | 0 | 3047 | 949 |
| 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 | | | | 0.00 | 1.00 | 0.00 | 0.00 | 0.93 | 0.00 |
| Uniform Delay (d), s/veh | 18.7 | 0.0 | 19.9 | | | | 0.0 | 6.7 | 0.0 | 0.0 | 5.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 1.3 | | | | 0.0 | 0.5 | 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 | 3.4 | 0.0 | 4.1 | | | | 0.0 | 4.5 | 0.0 | 0.0 | 2.6 | 0.0 |
| LnGrp Delay(d),s/veh | 19.2 | 0.0 | 21.1 | | | | 0.0 | 7.2 | 0.0 | 0.0 | 6.2 | 0.0 |
| LnGrp LOS | B | | C | | | | | A | | | A | |
| Approach Vol, veh/h | | 1007 | | | | | | 1424 | | | 935 | |
| Approach Delay, s/veh | | 20.2 | | | | | | 7.2 | | | 6.2 | |
| Approach LOS | | C | | | | | | A | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 54.9 | | 20.1 | | 54.9 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 36.0 | | 31.0 | | 36.0 | | |
| Max Q Clear Time (g_c+I1), s | | 11.4 | | 12.3 | | 7.4 | | |
| Green Ext Time (p_c), s | | 17.5 | | 3.8 | | 19.4 | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 10.8 |
| HCM 2010 LOS | | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 490 | 310 | 100 | 60 | 330 | 550 | 60 | 1680 | 50 | 690 | 1140 | 290 |
| 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 533 | 337 | 30 | 65 | 359 | 321 | 65 | 1826 | 14 | 750 | 1239 | 144 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 505 | 1678 | 520 | 103 | 1085 | 335 | 103 | 1627 | 504 | 734 | 2560 | 795 |
| Arrive On Green | 0.15 | 0.33 | 0.33 | 0.03 | 0.21 | 0.21 | 0.03 | 0.32 | 0.32 | 0.21 | 0.50 | 0.50 |
| Sat Flow, veh/h | 3442 | 5085 | 1576 | 3442 | 5085 | 1572 | 3442 | 5085 | 1576 | 3442 | 5085 | 1579 |
| Grp Volume(v), veh/h | 533 | 337 | 30 | 65 | 359 | 321 | 65 | 1826 | 14 | 750 | 1239 | 144 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1695 | 1576 | 1721 | 1695 | 1572 | 1721 | 1695 | 1576 | 1721 | 1695 | 1579 |
| Q Serve(g_s), s | 22.0 | 7.1 | 1.9 | 2.8 | 9.0 | 30.3 | 2.8 | 48.0 | 0.9 | 32.0 | 24.0 | 7.5 |
| Cycle Q Clear(g_c), s | 22.0 | 7.1 | 1.9 | 2.8 | 9.0 | 30.3 | 2.8 | 48.0 | 0.9 | 32.0 | 24.0 | 7.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 505 | 1678 | 520 | 103 | 1085 | 335 | 103 | 1627 | 504 | 734 | 2560 | 795 |
| V/C Ratio(X) | 1.06 | 0.20 | 0.06 | 0.63 | 0.33 | 0.96 | 0.63 | 1.12 | 0.03 | 1.02 | 0.48 | 0.18 |
| Avail Cap(c_a), veh/h | 505 | 1678 | 520 | 138 | 1085 | 335 | 138 | 1627 | 504 | 734 | 2560 | 795 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 64.0 | 36.1 | 34.3 | 71.9 | 49.9 | 58.3 | 71.9 | 51.0 | 35.0 | 59.0 | 24.5 | 20.4 |
| Incr Delay (d2), s/veh | 55.6 | 0.1 | 0.0 | 6.2 | 0.2 | 37.8 | 6.2 | 63.7 | 0.0 | 38.8 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 14.3 | 3.3 | 0.9 | 1.4 | 4.2 | 16.7 | 1.4 | 32.1 | 0.4 | 19.1 | 11.3 | 3.3 |
| LnGrp Delay(d),s/veh | 119.6 | 36.1 | 34.4 | 78.1 | 50.1 | 96.1 | 78.1 | 114.7 | 35.0 | 97.8 | 24.6 | 20.5 |
| LnGrp LOS | F | D | C | E | D | F | E | F | D | F | C | C |
| Approach Vol, veh/h | | 900 | | | 745 | | | 1905 | | | 2133 | |
| Approach Delay, s/veh | | 85.5 | | | 72.4 | | | 112.9 | | | 50.0 | |
| Approach LOS | | F | | | E | | | F | | | 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 | 36.0 | 52.0 | 8.5 | 53.5 | 8.5 | 79.5 | 26.0 | 36.0 |
| 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 | 32.0 | 48.0 | 6.0 | 48.0 | 6.0 | 74.0 | 22.0 | 32.0 |
| Max Q Clear Time (g_c+I1), s | 34.0 | 50.0 | 4.8 | 9.1 | 4.8 | 26.0 | 24.0 | 32.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 6.5 | 0.0 | 37.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 79.6 |
| HCM 2010 LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 130 | 430 | 490 | 10 | 410 | 60 | 380 | 50 | 20 | 50 | 90 | 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 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 141 | 467 | 174 | 11 | 446 | 17 | 413 | 54 | 7 | 54 | 98 | 14 |
| Adj No. of Lanes | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 223 | 681 | 575 | 20 | 581 | 492 | 475 | 652 | 550 | 68 | 224 | 188 |
| Arrive On Green | 0.06 | 0.37 | 0.37 | 0.01 | 0.31 | 0.31 | 0.27 | 0.35 | 0.35 | 0.04 | 0.12 | 0.12 |
| Sat Flow, veh/h | 3442 | 1863 | 1573 | 1774 | 1863 | 1576 | 1774 | 1863 | 1572 | 1774 | 1863 | 1564 |
| Grp Volume(v), veh/h | 141 | 467 | 174 | 11 | 446 | 17 | 413 | 54 | 7 | 54 | 98 | 14 |
| Grp Sat Flow(s),veh/h/ln | 1721 | 1863 | 1573 | 1774 | 1863 | 1576 | 1774 | 1863 | 1572 | 1774 | 1863 | 1564 |
| Q Serve(g_s), s | 2.7 | 14.5 | 5.4 | 0.4 | 14.8 | 0.5 | 15.1 | 1.3 | 0.2 | 2.1 | 3.3 | 0.5 |
| Cycle Q Clear(g_c), s | 2.7 | 14.5 | 5.4 | 0.4 | 14.8 | 0.5 | 15.1 | 1.3 | 0.2 | 2.1 | 3.3 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 223 | 681 | 575 | 20 | 581 | 492 | 475 | 652 | 550 | 68 | 224 | 188 |
| V/C Ratio(X) | 0.63 | 0.69 | 0.30 | 0.56 | 0.77 | 0.03 | 0.87 | 0.08 | 0.01 | 0.79 | 0.44 | 0.07 |
| Avail Cap(c_a), veh/h | 253 | 793 | 670 | 104 | 766 | 648 | 807 | 1422 | 1200 | 234 | 820 | 689 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.1 | 18.3 | 15.4 | 33.5 | 21.2 | 16.3 | 23.8 | 14.8 | 14.5 | 32.5 | 27.8 | 26.6 |
| Incr Delay (d2), s/veh | 4.2 | 2.0 | 0.3 | 22.8 | 3.4 | 0.0 | 5.4 | 0.1 | 0.0 | 18.2 | 1.3 | 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 | 1.4 | 7.8 | 2.4 | 0.3 | 8.1 | 0.2 | 8.1 | 0.7 | 0.1 | 1.4 | 1.8 | 0.2 |
| LnGrp Delay(d),s/veh | 35.3 | 20.3 | 15.7 | 56.4 | 24.6 | 16.3 | 29.2 | 14.9 | 14.5 | 50.7 | 29.1 | 26.7 |
| LnGrp LOS | D | C | B | E | C | B | C | B | B | D | C | C |
| Approach Vol, veh/h | | 782 | | | 474 | | | 474 | | | 166 | |
| Approach Delay, s/veh | | 22.0 | | | 25.0 | | | 27.3 | | | 36.0 | |
| Approach LOS | | C | | | C | | | 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 | 6.6 | 27.8 | 4.8 | 28.9 | 22.3 | 12.2 | 8.4 | 25.3 |
| 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 | 9.0 | 52.0 | 4.0 | 29.0 | 31.0 | 30.0 | 5.0 | 28.0 |
| Max Q Clear Time (g_c+I1), s | 4.1 | 3.3 | 2.4 | 16.5 | 17.1 | 5.3 | 4.7 | 16.8 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | 0.0 | 4.8 | 1.1 | 0.9 | 0.0 | 4.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.3 |
| HCM 2010 LOS | C |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 5.7 |
| Intersection LOS | A |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 55 | 293 | 55 | 250 |
| Demand Flow Rate, veh/h | 56 | 299 | 56 | 254 |
| Vehicles Circulating, veh/h | 243 | 33 | 266 | 77 |
| Vehicles Exiting, veh/h | 88 | 289 | 33 | 255 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 5 | 5 | 5 | 5 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 4.7 | 6.0 | 4.9 | 5.8 |
| Approach LOS | A | A | A | A |

| Lane | Left | Left | Left | Left |
|---|---|---|---|---|
| Designated Moves | LTR | LTR | LTR | LTR |
| Assumed Moves | LTR | LTR | LTR | LTR |
| RT Channelized | | | | |
| Lane Util | 1.000 | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 56 | 299 | 56 | 254 |
| Cap Entry Lane, veh/h | 886 | 1093 | 866 | 1046 |
| Entry HV Adj Factor | 0.988 | 0.980 | 0.978 | 0.983 |
| Flow Entry, veh/h | 55 | 293 | 55 | 250 |
| Cap Entry, veh/h | 875 | 1070 | 847 | 1028 |
| V/C Ratio | 0.063 | 0.274 | 0.065 | 0.243 |
| Control Delay, s/veh | 4.7 | 6.0 | 4.9 | 5.8 |
| LOS | A | A | A | A |
| 95th %tile Queue, veh | 0 | 1 | 0 | 1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 170 | 60 | 30 | 50 | 60 | 10 | 20 | 1230 | 70 | 10 | 1100 | 190 |
| 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 | | 0.98 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 125 | 149 | 4 | 54 | 65 | 3 | 22 | 1337 | 71 | 11 | 1196 | 77 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 3 | 0 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 240 | 252 | 212 | 148 | 147 | 7 | 36 | 2451 | 130 | 20 | 2474 | 766 |
| Arrive On Green | 0.14 | 0.14 | 0.14 | 0.08 | 0.08 | 0.08 | 0.02 | 0.50 | 0.50 | 0.01 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1774 | 1863 | 1566 | 1774 | 1765 | 81 | 1774 | 4943 | 262 | 1774 | 5085 | 1575 |
| Grp Volume(v), veh/h | 125 | 149 | 4 | 54 | 0 | 68 | 22 | 917 | 491 | 11 | 1196 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1566 | 1774 | 0 | 1847 | 1774 | 1695 | 1815 | 1774 | 1695 | 1575 |
| Q Serve(g_s), s | 3.8 | 4.4 | 0.1 | 1.7 | 0.0 | 2.0 | 0.7 | 10.9 | 10.9 | 0.4 | 9.2 | 1.5 |
| Cycle Q Clear(g_c), s | 3.8 | 4.4 | 0.1 | 1.7 | 0.0 | 2.0 | 0.7 | 10.9 | 10.9 | 0.4 | 9.2 | 1.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.04 | 1.00 | | 0.14 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 240 | 252 | 212 | 148 | 0 | 154 | 36 | 1681 | 900 | 20 | 2474 | 766 |
| V/C Ratio(X) | 0.52 | 0.59 | 0.02 | 0.37 | 0.00 | 0.44 | 0.60 | 0.55 | 0.55 | 0.55 | 0.48 | 0.10 |
| Avail Cap(c_a), veh/h | 700 | 735 | 618 | 883 | 0 | 919 | 152 | 1920 | 1028 | 122 | 2793 | 865 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.4 | 23.7 | 21.8 | 25.3 | 0.0 | 25.4 | 28.3 | 10.2 | 10.2 | 28.7 | 10.0 | 8.1 |
| Incr Delay (d2), s/veh | 1.8 | 2.2 | 0.0 | 1.5 | 0.0 | 2.0 | 14.9 | 0.3 | 0.5 | 21.9 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 2.4 | 0.1 | 0.9 | 0.0 | 1.1 | 0.5 | 5.0 | 5.4 | 0.3 | 4.2 | 0.7 |
| LnGrp Delay(d),s/veh | 25.2 | 25.9 | 21.9 | 26.8 | 0.0 | 27.4 | 43.2 | 10.4 | 10.7 | 50.6 | 10.2 | 8.1 |
| LnGrp LOS | C | C | C | C | | C | D | B | B | D | B | A |
| Approach Vol, veh/h | | 278 | | | 122 | | | 1430 | | | 1284 | |
| Approach Delay, s/veh | | 25.5 | | | 27.1 | | | 11.0 | | | 10.4 | |
| Approach LOS | | C | | | C | | | 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 | 4.7 | 32.9 | | 11.9 | 5.2 | 32.3 | | 8.9 |
| Change Period (Y+Rc), s | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | | 4.0 |
| Max Green Setting (Gmax), s | 4.0 | 33.0 | | 23.0 | 5.0 | 32.0 | | 29.0 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 12.9 | | 6.4 | 2.7 | 11.2 | | 4.0 |
| Green Ext Time (p_c), s | 0.0 | 16.0 | | 0.9 | 0.0 | 16.4 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.7 |
| HCM 2010 LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 110 | 10 | 10 | 10 | 30 | 200 | 10 | 1480 | 10 | 110 | 1140 | 50 |
| 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 | | 0.99 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 120 | 11 | 2 | 11 | 33 | 74 | 11 | 1609 | 4 | 120 | 1239 | 26 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 153 | 300 | 55 | 20 | 61 | 137 | 20 | 2437 | 755 | 154 | 2822 | 875 |
| Arrive On Green | 0.09 | 0.20 | 0.20 | 0.01 | 0.12 | 0.12 | 0.01 | 0.48 | 0.48 | 0.09 | 0.55 | 0.55 |
| Sat Flow, veh/h | 1774 | 1532 | 279 | 1774 | 507 | 1138 | 1774 | 5085 | 1575 | 1774 | 5085 | 1576 |
| Grp Volume(v), veh/h | 120 | 0 | 13 | 11 | 0 | 107 | 11 | 1609 | 4 | 120 | 1239 | 26 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1811 | 1774 | 0 | 1645 | 1774 | 1695 | 1575 | 1774 | 1695 | 1576 |
| Q Serve(g_s), s | 4.7 | 0.0 | 0.4 | 0.4 | 0.0 | 4.3 | 0.4 | 17.0 | 0.1 | 4.7 | 10.1 | 0.5 |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 0.4 | 0.4 | 0.0 | 4.3 | 0.4 | 17.0 | 0.1 | 4.7 | 10.1 | 0.5 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.69 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 153 | 0 | 355 | 20 | 0 | 198 | 20 | 2437 | 755 | 154 | 2822 | 875 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.04 | 0.56 | 0.00 | 0.54 | 0.56 | 0.66 | 0.01 | 0.78 | 0.44 | 0.03 |
| Avail Cap(c_a), veh/h | 227 | 0 | 875 | 101 | 0 | 678 | 101 | 2601 | 806 | 252 | 3034 | 941 |
| 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 | 31.5 | 0.0 | 22.9 | 34.6 | 0.0 | 29.1 | 34.6 | 14.0 | 9.6 | 31.5 | 9.2 | 7.1 |
| Incr Delay (d2), s/veh | 10.1 | 0.0 | 0.0 | 23.1 | 0.0 | 2.3 | 23.1 | 0.6 | 0.0 | 8.3 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.7 | 0.0 | 0.2 | 0.3 | 0.0 | 2.1 | 0.3 | 8.0 | 0.0 | 2.6 | 4.7 | 0.2 |
| LnGrp Delay(d),s/veh | 41.6 | 0.0 | 23.0 | 57.7 | 0.0 | 31.4 | 57.7 | 14.5 | 9.6 | 39.8 | 9.3 | 7.1 |
| LnGrp LOS | D | | C | E | | C | E | B | A | D | A | A |
| Approach Vol, veh/h | | 133 | | | 118 | | | 1624 | | | 1385 | |
| Approach Delay, s/veh | | 39.8 | | | 33.9 | | | 14.8 | | | 11.9 | |
| Approach LOS | | D | | | 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 | 10.1 | 37.7 | 4.8 | 17.8 | 4.8 | 43.1 | 10.1 | 12.5 |
| 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 | 10.0 | 36.0 | 4.0 | 34.0 | 4.0 | 42.0 | 9.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 6.7 | 19.0 | 2.4 | 2.4 | 2.4 | 12.1 | 6.7 | 6.3 |
| Green Ext Time (p_c), s | 0.1 | 14.8 | 0.0 | 0.6 | 0.0 | 23.8 | 0.1 | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 80 | 40 | 10 | 10 | 190 | 330 | 20 | 40 | 10 | 550 | 10 | 30 |
| 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 | | 0.98 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 87 | 43 | 2 | 11 | 207 | 56 | 22 | 43 | 0 | 598 | 11 | 13 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 111 | 380 | 18 | 20 | 306 | 256 | 37 | 140 | 0 | 689 | 344 | 406 |
| Arrive On Green | 0.06 | 0.22 | 0.22 | 0.01 | 0.16 | 0.16 | 0.02 | 0.08 | 0.00 | 0.39 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1774 | 1765 | 82 | 1774 | 1863 | 1559 | 1774 | 1863 | 0 | 1774 | 777 | 918 |
| Grp Volume(v), veh/h | 87 | 0 | 45 | 11 | 207 | 56 | 22 | 43 | 0 | 598 | 0 | 24 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1847 | 1774 | 1863 | 1559 | 1774 | 1863 | 0 | 1774 | 0 | 1695 |
| Q Serve(g_s), s | 2.5 | 0.0 | 1.0 | 0.3 | 5.4 | 1.6 | 0.6 | 1.1 | 0.0 | 16.1 | 0.0 | 0.4 |
| Cycle Q Clear(g_c), s | 2.5 | 0.0 | 1.0 | 0.3 | 5.4 | 1.6 | 0.6 | 1.1 | 0.0 | 16.1 | 0.0 | 0.4 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.54 |
| Lane Grp Cap(c), veh/h | 111 | 0 | 398 | 20 | 306 | 256 | 37 | 140 | 0 | 689 | 0 | 750 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.11 | 0.55 | 0.68 | 0.22 | 0.59 | 0.31 | 0.00 | 0.87 | 0.00 | 0.03 |
| Avail Cap(c_a), veh/h | 206 | 0 | 572 | 137 | 505 | 423 | 172 | 613 | 0 | 1271 | 0 | 1608 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.9 | 0.0 | 16.3 | 25.4 | 20.3 | 18.7 | 25.1 | 22.6 | 0.0 | 14.6 | 0.0 | 8.1 |
| Incr Delay (d2), s/veh | 11.5 | 0.0 | 0.1 | 21.3 | 2.6 | 0.4 | 14.1 | 1.2 | 0.0 | 3.5 | 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 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 0.5 | 0.3 | 3.0 | 0.7 | 0.5 | 0.6 | 0.0 | 8.5 | 0.0 | 0.2 |
| LnGrp Delay(d),s/veh | 35.4 | 0.0 | 16.4 | 46.7 | 22.9 | 19.1 | 39.1 | 23.8 | 0.0 | 18.1 | 0.0 | 8.2 |
| LnGrp LOS | D | | B | D | C | B | D | C | | B | | A |
| Approach Vol, veh/h | | 132 | | | 274 | | | 65 | | | 622 | |
| Approach Delay, s/veh | | 28.9 | | | 23.1 | | | 29.0 | | | 17.7 | |
| Approach LOS | | C | | | 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 | 24.0 | 7.9 | 4.6 | 15.1 | 5.1 | 26.8 | 7.2 | 12.5 |
| 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 | 37.0 | 17.0 | 4.0 | 16.0 | 5.0 | 49.0 | 6.0 | 14.0 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 3.1 | 2.3 | 3.0 | 2.6 | 2.4 | 4.5 | 7.4 |
| Green Ext Time (p_c), s | 2.0 | 0.2 | 0.0 | 1.1 | 0.0 | 0.4 | 0.0 | 0.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 21.1 |
| HCM 2010 LOS | | C |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.1 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Vol, veh/h | 40 | 50 | 610 | 40 | 50 | 460 |
| Conflicting Peds, #/hr | 0 | 5 | 0 | 5 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 200 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 54 | 663 | 43 | 54 | 500 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1299 | 690 | 0 | 0 | 712 | 0 |
| Stage 1 | 690 | - | - | - | - | - |
| Stage 2 | 609 | - | - | - | - | - |
| 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 | 178 | 445 | - | - | 888 | - |
| Stage 1 | 498 | - | - | - | - | - |
| Stage 2 | 543 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 162 | 443 | - | - | 888 | - |
| Mov Cap-2 Maneuver | 162 | - | - | - | - | - |
| Stage 1 | 496 | - | - | - | - | - |
| Stage 2 | 495 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 23.6 | 0 | 0.9 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | WBLn2 | SBL | SBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 162 | 443 | 888 | - |
| HCM Lane V/C Ratio | - | - | 0.268 | 0.123 | 0.061 | - |
| HCM Control Delay (s) | - | - | 35.2 | 14.3 | 9.3 | 0 |
| HCM Lane LOS | - | - | E | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 1 | 0.4 | 0.2 | - |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 4.4 |
| Intersection LOS | A |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Entry Lanes | 1 | 1 | 1 | 1 |
| Conflicting Circle Lanes | 1 | 1 | 1 | 1 |
| Adj Approach Flow, veh/h | 33 | 153 | 109 | 33 |
| Demand Flow Rate, veh/h | 33 | 155 | 111 | 33 |
| Vehicles Circulating, veh/h | 144 | 44 | 33 | 155 |
| Vehicles Exiting, veh/h | 44 | 100 | 144 | 44 |
| Follow-Up Headway, s | 3.186 | 3.186 | 3.186 | 3.186 |
| Ped Vol Crossing Leg, #/h | 5 | 5 | 5 | 5 |
| Ped Cap Adj | 0.999 | 0.999 | 0.999 | 0.999 |
| Approach Delay, s/veh | 4.0 | 4.7 | 4.3 | 4.1 |
| Approach LOS | A | A | A | A |

| Lane | Left | Left | Left | Left |
|---|---|---|---|---|
| Designated Moves | LTR | LTR | LTR | LTR |
| Assumed Moves | LTR | LTR | LTR | LTR |
| RT Channelized | | | | |
| Lane Util | 1.000 | 1.000 | 1.000 | 1.000 |
| Critical Headway, s | 5.193 | 5.193 | 5.193 | 5.193 |
| Entry Flow, veh/h | 33 | 155 | 111 | 33 |
| Cap Entry Lane, veh/h | 978 | 1081 | 1093 | 968 |
| Entry HV Adj Factor | 0.993 | 0.984 | 0.978 | 0.993 |
| Flow Entry, veh/h | 33 | 153 | 109 | 33 |
| Cap Entry, veh/h | 971 | 1064 | 1069 | 961 |
| V/C Ratio | 0.034 | 0.143 | 0.102 | 0.034 |
| Control Delay, s/veh | 4.0 | 4.7 | 4.3 | 4.1 |
| LOS | A | A | A | A |
| 95th %tile Queue, veh | 0 | 1 | 0 | 0 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 50 | 40 | 50 | 1270 | 1090 | 90 |
| 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 | 54 | 2 | 54 | 1380 | 1185 | 65 |
| Adj No. of Lanes | 1 | 1 | 1 | 2 | 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 | 80 | 71 | 455 | 2740 | 2740 | 1222 |
| Arrive On Green | 0.04 | 0.04 | 0.77 | 0.77 | 0.77 | 0.77 |
| Sat Flow, veh/h | 1774 | 1583 | 443 | 3632 | 3632 | 1578 |
| Grp Volume(v), veh/h | 54 | 2 | 54 | 1380 | 1185 | 65 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1583 | 443 | 1770 | 1770 | 1578 |
| Q Serve(g_s), s | 1.3 | 0.1 | 2.1 | 6.4 | 5.0 | 0.4 |
| Cycle Q Clear(g_c), s | 1.3 | 0.1 | 7.1 | 6.4 | 5.0 | 0.4 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 80 | 71 | 455 | 2740 | 2740 | 1222 |
| V/C Ratio(X) | 0.68 | 0.03 | 0.12 | 0.50 | 0.43 | 0.05 |
| Avail Cap(c_a), veh/h | 641 | 572 | 522 | 3278 | 3278 | 1462 |
| 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 | 20.8 | 20.2 | 2.9 | 1.8 | 1.7 | 1.2 |
| Incr Delay (d2), s/veh | 9.6 | 0.2 | 0.1 | 0.1 | 0.1 | 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 | 0.9 | 0.0 | 0.3 | 2.9 | 2.3 | 0.2 |
| LnGrp Delay(d),s/veh | 30.4 | 20.4 | 3.0 | 2.0 | 1.8 | 1.2 |
| LnGrp LOS | C | C | A | A | A | A |
| Approach Vol, veh/h | 56 | | | 1434 | 1250 | |
| Approach Delay, s/veh | 30.0 | | | 2.0 | 1.8 | |
| Approach LOS | C | | | A | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 38.3 | | 6.0 | | 38.3 | | |
| Change Period (Y+Rc), s | | 4.0 | | 4.0 | | 4.0 | | |
| Max Green Setting (Gmax), s | | 41.0 | | 16.0 | | 41.0 | | |
| Max Q Clear Time (g_c+I1), s | | 9.1 | | 3.3 | | 7.0 | | |
| Green Ext Time (p_c), s | | 25.2 | | 0.1 | | 26.5 | | |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 2.5 |
| HCM 2010 LOS | | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 130 | 50 | 10 | 20 | 50 | 30 | 20 | 720 | 40 | 110 | 860 | 120 |
| 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 | | 0.99 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 141 | 54 | 1 | 22 | 54 | 0 | 22 | 783 | 15 | 120 | 935 | 59 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 182 | 327 | 276 | 37 | 175 | 148 | 37 | 1402 | 623 | 157 | 1639 | 729 |
| Arrive On Green | 0.10 | 0.18 | 0.18 | 0.02 | 0.09 | 0.00 | 0.02 | 0.40 | 0.40 | 0.09 | 0.46 | 0.46 |
| Sat Flow, veh/h | 1774 | 1863 | 1570 | 1774 | 1863 | 1583 | 1774 | 3539 | 1573 | 1774 | 3539 | 1575 |
| Grp Volume(v), veh/h | 141 | 54 | 1 | 22 | 54 | 0 | 22 | 783 | 15 | 120 | 935 | 59 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1863 | 1570 | 1774 | 1863 | 1583 | 1774 | 1770 | 1573 | 1774 | 1770 | 1575 |
| Q Serve(g_s), s | 3.9 | 1.2 | 0.0 | 0.6 | 1.4 | 0.0 | 0.6 | 8.6 | 0.3 | 3.3 | 9.7 | 1.0 |
| Cycle Q Clear(g_c), s | 3.9 | 1.2 | 0.0 | 0.6 | 1.4 | 0.0 | 0.6 | 8.6 | 0.3 | 3.3 | 9.7 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 182 | 327 | 276 | 37 | 175 | 148 | 37 | 1402 | 623 | 157 | 1639 | 729 |
| V/C Ratio(X) | 0.77 | 0.17 | 0.00 | 0.59 | 0.31 | 0.00 | 0.59 | 0.56 | 0.02 | 0.77 | 0.57 | 0.08 |
| Avail Cap(c_a), veh/h | 354 | 1040 | 877 | 177 | 855 | 726 | 142 | 1694 | 753 | 425 | 2259 | 1005 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.9 | 17.5 | 17.0 | 24.3 | 21.2 | 0.0 | 24.3 | 11.7 | 9.2 | 22.4 | 9.8 | 7.5 |
| Incr Delay (d2), s/veh | 6.8 | 0.2 | 0.0 | 13.9 | 1.0 | 0.0 | 13.9 | 0.4 | 0.0 | 7.6 | 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 | 2.2 | 0.7 | 0.0 | 0.4 | 0.7 | 0.0 | 0.4 | 4.2 | 0.1 | 2.0 | 4.7 | 0.5 |
| LnGrp Delay(d),s/veh | 28.7 | 17.8 | 17.1 | 38.2 | 22.2 | 0.0 | 38.2 | 12.1 | 9.2 | 30.0 | 10.1 | 7.6 |
| LnGrp LOS | C | B | B | D | C | | D | B | A | C | B | A |
| Approach Vol, veh/h | | 196 | | | 76 | | | 820 | | | 1114 | |
| Approach Delay, s/veh | | 25.6 | | | 26.8 | | | 12.7 | | | 12.1 | |
| 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 | 8.4 | 23.9 | 5.1 | 12.8 | 5.1 | 27.2 | 9.2 | 8.7 |
| 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 | 12.0 | 24.0 | 5.0 | 28.0 | 4.0 | 32.0 | 10.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 10.6 | 2.6 | 3.2 | 2.6 | 11.7 | 5.9 | 3.4 |
| Green Ext Time (p_c), s | 0.1 | 8.7 | 0.0 | 0.4 | 0.0 | 11.6 | 0.1 | 0.4 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2010 Ctrl Delay | | | 14.1 |
| HCM 2010 LOS | | | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 120 | 80 | 40 | 85 | 50 | 90 | 590 | 40 | 80 | 400 | 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 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 130 | 54 | 43 | 92 | 26 | 98 | 641 | 40 | 87 | 435 | 20 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 20 | 200 | 83 | 61 | 257 | 73 | 126 | 803 | 50 | 111 | 803 | 37 |
| Arrive On Green | 0.01 | 0.16 | 0.16 | 0.03 | 0.18 | 0.18 | 0.07 | 0.46 | 0.46 | 0.06 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1774 | 1245 | 517 | 1774 | 1393 | 394 | 1774 | 1735 | 108 | 1774 | 1767 | 81 |
| Grp Volume(v), veh/h | 11 | 0 | 184 | 43 | 0 | 118 | 98 | 0 | 681 | 87 | 0 | 455 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1762 | 1774 | 0 | 1787 | 1774 | 0 | 1843 | 1774 | 0 | 1848 |
| Q Serve(g_s), s | 0.4 | 0.0 | 5.6 | 1.4 | 0.0 | 3.3 | 3.1 | 0.0 | 18.1 | 2.8 | 0.0 | 10.2 |
| Cycle Q Clear(g_c), s | 0.4 | 0.0 | 5.6 | 1.4 | 0.0 | 3.3 | 3.1 | 0.0 | 18.1 | 2.8 | 0.0 | 10.2 |
| Prop In Lane | 1.00 | | 0.29 | 1.00 | | 0.22 | 1.00 | | 0.06 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 20 | 0 | 284 | 61 | 0 | 330 | 126 | 0 | 853 | 111 | 0 | 840 |
| V/C Ratio(X) | 0.55 | 0.00 | 0.65 | 0.70 | 0.00 | 0.36 | 0.78 | 0.00 | 0.80 | 0.78 | 0.00 | 0.54 |
| Avail Cap(c_a), veh/h | 124 | 0 | 522 | 124 | 0 | 529 | 216 | 0 | 1189 | 186 | 0 | 1159 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.2 | 0.0 | 22.5 | 27.4 | 0.0 | 20.4 | 26.2 | 0.0 | 13.1 | 26.5 | 0.0 | 11.3 |
| Incr Delay (d2), s/veh | 21.8 | 0.0 | 2.5 | 13.5 | 0.0 | 0.7 | 9.9 | 0.0 | 2.7 | 11.3 | 0.0 | 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 | 0.3 | 0.0 | 2.9 | 0.9 | 0.0 | 1.7 | 1.9 | 0.0 | 9.7 | 1.7 | 0.0 | 5.3 |
| LnGrp Delay(d),s/veh | 50.1 | 0.0 | 25.0 | 40.9 | 0.0 | 21.1 | 36.1 | 0.0 | 15.8 | 37.8 | 0.0 | 11.9 |
| LnGrp LOS | D | | C | D | | C | D | | B | D | | B |
| Approach Vol, veh/h | | 195 | | | 161 | | | 779 | | | 542 | |
| Approach Delay, s/veh | | 26.4 | | | 26.4 | | | 18.4 | | | 16.0 | |
| 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 | 7.6 | 30.6 | 6.0 | 13.2 | 8.1 | 30.1 | 4.6 | 14.6 |
| 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 | 6.0 | 37.0 | 4.0 | 17.0 | 7.0 | 36.0 | 4.0 | 17.0 |
| Max Q Clear Time (g_c+I1), s | 4.8 | 20.1 | 3.4 | 7.6 | 5.1 | 12.2 | 2.4 | 5.3 |
| Green Ext Time (p_c), s | 0.0 | 6.5 | 0.0 | 1.0 | 0.0 | 7.5 | 0.0 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 220 | 10 | 30 | 10 | 10 | 20 | 30 | 1080 | 10 | 40 | 930 | 130 |
| 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 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 239 | 11 | 8 | 11 | 11 | 0 | 33 | 1174 | 10 | 43 | 1011 | 130 |
| Adj No. of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 290 | 213 | 155 | 20 | 112 | 0 | 49 | 1801 | 15 | 59 | 1597 | 205 |
| Arrive On Green | 0.16 | 0.21 | 0.21 | 0.01 | 0.06 | 0.00 | 0.03 | 0.50 | 0.50 | 0.03 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1774 | 1001 | 728 | 1774 | 1863 | 0 | 1774 | 3596 | 31 | 1774 | 3153 | 405 |
| Grp Volume(v), veh/h | 239 | 0 | 19 | 11 | 11 | 0 | 33 | 578 | 606 | 43 | 567 | 574 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 0 | 1728 | 1774 | 1863 | 0 | 1774 | 1770 | 1857 | 1774 | 1770 | 1789 |
| Q Serve(g_s), s | 8.6 | 0.0 | 0.6 | 0.4 | 0.4 | 0.0 | 1.2 | 16.0 | 16.0 | 1.6 | 15.4 | 15.4 |
| Cycle Q Clear(g_c), s | 8.6 | 0.0 | 0.6 | 0.4 | 0.4 | 0.0 | 1.2 | 16.0 | 16.0 | 1.6 | 15.4 | 15.4 |
| Prop In Lane | 1.00 | | 0.42 | 1.00 | | 0.00 | 1.00 | | 0.02 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 290 | 0 | 368 | 20 | 112 | 0 | 49 | 886 | 930 | 59 | 896 | 906 |
| V/C Ratio(X) | 0.82 | 0.00 | 0.05 | 0.56 | 0.10 | 0.00 | 0.68 | 0.65 | 0.65 | 0.73 | 0.63 | 0.63 |
| Avail Cap(c_a), veh/h | 457 | 0 | 942 | 107 | 649 | 0 | 107 | 1072 | 1125 | 107 | 1072 | 1083 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.7 | 0.0 | 20.7 | 32.5 | 29.3 | 0.0 | 31.8 | 12.2 | 12.2 | 31.6 | 11.8 | 11.9 |
| Incr Delay (d2), s/veh | 6.7 | 0.0 | 0.1 | 22.6 | 0.4 | 0.0 | 15.1 | 1.0 | 1.0 | 16.1 | 0.9 | 0.9 |
| 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 | 4.7 | 0.0 | 0.3 | 0.3 | 0.2 | 0.0 | 0.8 | 8.0 | 8.3 | 1.0 | 7.6 | 7.7 |
| LnGrp Delay(d),s/veh | 33.4 | 0.0 | 20.7 | 55.1 | 29.7 | 0.0 | 46.9 | 13.3 | 13.2 | 47.7 | 12.7 | 12.7 |
| LnGrp LOS | C | | C | E | C | | D | B | B | D | B | B |
| Approach Vol, veh/h | | 258 | | | 22 | | | 1217 | | | 1184 | |
| Approach Delay, s/veh | | 32.5 | | | 42.4 | | | 14.2 | | | 14.0 | |
| Approach LOS | | C | | | D | | | 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 | 6.2 | 37.1 | 4.7 | 18.1 | 5.8 | 37.4 | 14.8 | 8.0 |
| 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 | 4.0 | 40.0 | 4.0 | 36.0 | 4.0 | 40.0 | 17.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 3.6 | 18.0 | 2.4 | 2.6 | 3.2 | 17.4 | 10.6 | 2.4 |
| Green Ext Time (p_c), s | 0.0 | 15.1 | 0.0 | 0.1 | 0.0 | 15.4 | 0.3 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 30 | 1220 | 370 | 50 | 1050 | 490 | 370 | 600 | 50 | 390 | 560 | 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 33 | 1326 | 167 | 52 | 1141 | 291 | 385 | 625 | 46 | 424 | 583 | 19 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 3 | 1 | 2 | 2 | 0 | 2 | 2 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.96 | 0.96 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.92 | 0.96 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 44 | 1410 | 630 | 66 | 2090 | 650 | 456 | 830 | 61 | 494 | 907 | 30 |
| Arrive On Green | 0.02 | 0.40 | 0.40 | 0.04 | 0.41 | 0.41 | 0.13 | 0.25 | 0.25 | 0.14 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1774 | 3539 | 1581 | 1774 | 5085 | 1581 | 3442 | 3343 | 246 | 3442 | 3498 | 114 |
| Grp Volume(v), veh/h | 33 | 1326 | 167 | 52 | 1141 | 291 | 385 | 331 | 340 | 424 | 295 | 307 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1770 | 1581 | 1774 | 1695 | 1581 | 1721 | 1770 | 1819 | 1721 | 1770 | 1842 |
| Q Serve(g_s), s | 1.7 | 33.4 | 6.6 | 2.7 | 15.8 | 12.3 | 10.1 | 16.0 | 16.1 | 11.2 | 13.7 | 13.7 |
| Cycle Q Clear(g_c), s | 1.7 | 33.4 | 6.6 | 2.7 | 15.8 | 12.3 | 10.1 | 16.0 | 16.1 | 11.2 | 13.7 | 13.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.14 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 44 | 1410 | 630 | 66 | 2090 | 650 | 456 | 439 | 451 | 494 | 459 | 478 |
| V/C Ratio(X) | 0.75 | 0.94 | 0.27 | 0.78 | 0.55 | 0.45 | 0.84 | 0.75 | 0.75 | 0.86 | 0.64 | 0.64 |
| Avail Cap(c_a), veh/h | 77 | 1412 | 631 | 115 | 2139 | 665 | 483 | 515 | 530 | 520 | 534 | 556 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.9 | 26.8 | 18.8 | 44.2 | 20.7 | 19.7 | 39.3 | 32.2 | 32.2 | 38.8 | 30.5 | 30.5 |
| Incr Delay (d2), s/veh | 22.5 | 12.5 | 0.2 | 17.9 | 0.3 | 0.5 | 12.5 | 5.2 | 5.1 | 13.0 | 2.1 | 2.0 |
| 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 | 1.1 | 18.6 | 2.9 | 1.6 | 7.4 | 5.5 | 5.6 | 8.4 | 8.7 | 6.2 | 7.0 | 7.3 |
| LnGrp Delay(d),s/veh | 67.4 | 39.3 | 19.0 | 62.1 | 21.0 | 20.2 | 51.8 | 37.4 | 37.4 | 51.8 | 32.6 | 32.5 |
| LnGrp LOS | E | D | B | E | C | C | D | D | D | D | C | C |
| Approach Vol, veh/h | | 1526 | | | 1484 | | | 1056 | | | 1026 | |
| Approach Delay, s/veh | | 37.7 | | | 22.3 | | | 42.6 | | | 40.5 | |
| Approach LOS | | D | | | C | | | D | | | 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 | 17.3 | 27.0 | 7.5 | 40.9 | 16.3 | 28.0 | 6.3 | 42.1 |
| 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 | 14.0 | 27.0 | 6.0 | 37.0 | 13.0 | 28.0 | 4.0 | 39.0 |
| Max Q Clear Time (g_c+I1), s | 13.2 | 18.1 | 4.7 | 35.4 | 12.1 | 15.7 | 3.7 | 17.8 |
| Green Ext Time (p_c), s | 0.2 | 4.8 | 0.0 | 1.5 | 0.1 | 5.9 | 0.0 | 17.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 34.8 |
| HCM 2010 LOS | C |

# Mitigations

| Intersection | |
|---|---|
| Int Delay, s/veh | 3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR |
|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 390 | 0 | 0 | 350 | 310 | 0 | 0 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Yield | Yield | Yield |
| RT Channelized | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | 150 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 415 | 0 | 0 | 372 | 330 | 0 | 0 | 0 |

| Major/Minor | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 372 | 0 | 0 | 415 | 0 | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 1186 | - | - | 1144 | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Platoon blocked, % | | - | - | | - | - |
| Mov Cap-1 Maneuver | 1186 | - | - | 1144 | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |

| Approach | EB | WB |
|---|---|---|
| HCM Control Delay, s | 0.2 | 0 |
| HCM LOS | | |

| Minor Lane/Major Mvmt | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1186 | - | - | 1144 | - | - | 309 |
| HCM Lane V/C Ratio | 0.009 | - | - | - | - | - | 0.465 |
| HCM Control Delay (s) | 8.1 | 0 | - | 0 | - | - | 26.4 |
| HCM Lane LOS | A | A | - | A | - | - | D |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - | - | 2.3 |

| Intersection | | | |
|---|---|---|---|
| Int Delay, s/veh | | | |

| Movement | SBL | SBT | SBR |
|---|---|---|---|
| Vol, veh/h | 120 | 5 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop |
| RT Channelized | - | - | None |
| Storage Length | - | - | - |
| Veh in Median Storage, # | - | 0 | - |
| Grade, % | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 |
| Heavy Vehicles, % | 2 | 2 | 2 |
| Mvmt Flow | 128 | 5 | 11 |

| Major/Minor | Minor2 | | |
|---|---|---|---|
| Conflicting Flow All | 808 | 808 | 372 |
| Stage 1 | 372 | 372 | - |
| Stage 2 | 436 | 436 | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 299 | 315 | 674 |
| Stage 1 | 648 | 619 | - |
| Stage 2 | 599 | 580 | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | 296 | 311 | 674 |
| Mov Cap-2 Maneuver | 296 | 311 | - |
| Stage 1 | 640 | 619 | - |
| Stage 2 | 592 | 573 | - |

| Approach | SB |
|---|---|
| HCM Control Delay, s | 26.4 |
| HCM LOS | D |

| Minor Lane/Major Mvmt |
|---|

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 170 | 340 | 645 | 420 | 130 | 140 | 610 | 1540 | 610 | 190 | 1350 | 170 |
| Number | 3 | 8 | 18 | 7 | 4 | 14 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q, 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 177 | 354 | 345 | 438 | 135 | 0 | 635 | 1604 | 0 | 198 | 1406 | 0 |
| Adj No. of Lanes | 2 | 2 | 1 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Opposing Right Turn Influence | Yes | | | Yes | | | Yes | | | Yes | | |
| Cap, veh/h | 235 | 851 | 381 | 529 | 967 | 433 | 645 | 2120 | 660 | 254 | 1543 | 480 |
| 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 |
| Prop Arrive On Green | 0.07 | 0.24 | 0.24 | 0.10 | 0.27 | 0.00 | 0.06 | 0.14 | 0.00 | 0.07 | 0.30 | 0.00 |
| Ln Grp Delay, s/veh | 56.8 | 38.3 | 68.5 | 59.0 | 32.3 | 0.0 | 71.5 | 45.6 | 0.0 | 63.4 | 48.0 | 0.0 |
| Ln Grp LOS | E | D | E | E | C | | E | D | | E | D | |
| Approach Vol, veh/h | | 876 | | | 573 | | | 2239 | | | 1604 | |
| Approach Delay, s/veh | | 54.0 | | | 52.7 | | | 52.9 | | | 49.9 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Case No | 2.0 | 3.0 | 2.0 | 3.0 | 2.0 | 3.0 | 2.0 | 3.0 |
| Phs Duration (G+Y+Rc), s | 13.1 | 57.1 | 12.5 | 37.3 | 29.5 | 40.8 | 16.3 | 33.4 |
| Change Period (Y+Rc), s | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 | 4.5 | 5.3 |
| Max Green (Gmax), s | 9.6 | 48.3 | 11.2 | 31.3 | 21.9 | 36.0 | 13.5 | 29.0 |
| Max Allow Headway (MAH), s | 2.7 | 7.3 | 2.7 | 6.8 | 2.7 | 7.3 | 2.7 | 6.8 |
| Max Q Clear (g_c+l1), s | 8.6 | 37.5 | 7.9 | 5.4 | 23.6 | 33.1 | 11.6 | 26.7 |
| Green Ext Time (g_e), s | 0.0 | 10.7 | 0.1 | 9.6 | 0.0 | 2.3 | 0.2 | 1.4 |
| Prob of Phs Call (p_c) | 1.00 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 |
| Prob of Max Out (p_x) | 1.00 | 1.00 | 0.42 | 0.20 | 1.00 | 1.00 | 1.00 | 1.00 |

| Left-Turn Movement Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | 1 | | 3 | | 5 | | 7 | |
| Mvmt Sat Flow, veh/h | 3442 | | 3442 | | 3442 | | 5216 | |

| Through Movement Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | | 2 | | 4 | | 6 | | 8 |
| Mvmt Sat Flow, veh/h | | 5085 | | 3539 | | 5085 | | 3539 |

| Right-Turn Movement Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | | 12 | | 14 | | 16 | | 18 |
| Mvmt Sat Flow, veh/h | | 1583 | | 1583 | | 1583 | | 1583 |

| Left Lane Group Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | 1 | 0 | 3 | 0 | 5 | 0 | 7 | 0 |
| Lane Assignment | (Prot) | | (Prot) | | (Prot) | | (Prot) | |
| Lanes in Grp | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grp Vol (v), veh/h | 198 | 0 | 177 | 0 | 635 | 0 | 438 | 0 |
| Grp Sat Flow (s), veh/h/ln | 1721 | 0 | 1721 | 0 | 1721 | 0 | 1739 | 0 |
| Q Serve Time (g_s), s | 6.6 | 0.0 | 5.9 | 0.0 | 21.6 | 0.0 | 9.6 | 0.0 |
| Cycle Q Clear Time (g_c), s | 6.6 | 0.0 | 5.9 | 0.0 | 21.6 | 0.0 | 9.6 | 0.0 |
| Perm LT Sat Flow (s_l), veh/h/ln | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Perm LT Eff Green (g_p), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perm LT Serve Time (g_u), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perm LT Q Serve Time (g_ps), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Time to First Blk (g_f), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Serve Time pre Blk (g_fs), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prop LT Inside Lane (P_L) | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| Lane Grp Cap (c), veh/h | 254 | 0 | 235 | 0 | 645 | 0 | 529 | 0 |
| V/C Ratio (X) | 0.78 | 0.00 | 0.75 | 0.00 | 0.99 | 0.00 | 0.83 | 0.00 |
| Avail Cap (c_a), veh/h | 283 | 0 | 330 | 0 | 645 | 0 | 602 | 0 |
| Upstream Filter (I) | 1.00 | 0.00 | 1.00 | 0.00 | 0.33 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d1), s/veh | 53.2 | 0.0 | 53.5 | 0.0 | 54.7 | 0.0 | 51.5 | 0.0 |
| Incr Delay (d2), s/veh | 10.2 | 0.0 | 3.3 | 0.0 | 16.8 | 0.0 | 7.5 | 0.0 |
| Initial Q Delay (d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (d), s/veh | 63.4 | 0.0 | 56.8 | 0.0 | 71.5 | 0.0 | 59.0 | 0.0 |
| 1st-Term Q (Q1), veh/ln | 3.1 | 0.0 | 2.8 | 0.0 | 10.3 | 0.0 | 4.6 | 0.0 |
| 2nd-Term Q (Q2), veh/ln | 0.4 | 0.0 | 0.1 | 0.0 | 1.5 | 0.0 | 0.4 | 0.0 |
| 3rd-Term Q (Q3), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile Back of Q Factor (f_B%) | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 3.5 | 0.0 | 2.9 | 0.0 | 11.8 | 0.0 | 5.0 | 0.0 |
| %ile Storage Ratio (RQ%) | 0.21 | 0.00 | 0.23 | 0.00 | 1.36 | 0.00 | 0.51 | 0.00 |
| Initial Q (Qb), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final (Residual) Q (Qe), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Delay (ds), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Q (Qs), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Cap (cs), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Q Clear Time (tc), h | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Middle Lane Group Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | 0 | 2 | 0 | 4 | 0 | 6 | 0 | 8 |
| Lane Assignment | | T | | T | | T | | T |
| Lanes in Grp | 0 | 3 | 0 | 2 | 0 | 3 | 0 | 2 |
| Grp Vol (v), veh/h | 0 | 1604 | 0 | 135 | 0 | 1406 | 0 | 354 |
| Grp Sat Flow (s), veh/h/ln | 0 | 1695 | 0 | 1770 | 0 | 1695 | 0 | 1770 |
| Q Serve Time (g_s), s | 0.0 | 35.5 | 0.0 | 3.4 | 0.0 | 31.1 | 0.0 | 9.9 |
| Cycle Q Clear Time (g_c), s | 0.0 | 35.5 | 0.0 | 3.4 | 0.0 | 31.1 | 0.0 | 9.9 |
| Lane Grp Cap (c), veh/h | 0 | 2120 | 0 | 967 | 0 | 1543 | 0 | 851 |
| V/C Ratio (X) | 0.00 | 0.76 | 0.00 | 0.14 | 0.00 | 0.91 | 0.00 | 0.42 |
| Avail Cap (c_a), veh/h | 0 | 2120 | 0 | 967 | 0 | 1566 | 0 | 878 |
| Upstream Filter (I) | 0.00 | 0.33 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d1), s/veh | 0.0 | 44.7 | 0.0 | 32.1 | 0.0 | 39.2 | 0.0 | 37.5 |
| Incr Delay (d2), s/veh | 0.0 | 0.9 | 0.0 | 0.2 | 0.0 | 8.8 | 0.0 | 0.8 |
| Initial Q Delay (d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (d), s/veh | 0.0 | 45.6 | 0.0 | 32.3 | 0.0 | 48.0 | 0.0 | 38.3 |
| 1st-Term Q (Q1), veh/ln | 0.0 | 16.7 | 0.0 | 1.7 | 0.0 | 14.6 | 0.0 | 4.8 |
| 2nd-Term Q (Q2), veh/ln | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3rd-Term Q (Q3), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| %ile Back of Q (50%), veh/ln | 0.0 | 16.9 | 0.0 | 1.7 | 0.0 | 15.8 | 0.0 | 4.9 |
| %ile Storage Ratio (RQ%) | 0.00 | 0.73 | 0.00 | 0.17 | 0.00 | 0.76 | 0.00 | 0.24 |
| Initial Q (Qb), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final (Residual) Q (Qe), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Delay (ds), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Q (Qs), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Cap (cs), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Q Clear Time (tc), h | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Right Lane Group Data** | | | | | | | | |
| Assigned Mvmt | 0 | 12 | 0 | 14 | 0 | 16 | 0 | 18 |
| Lane Assignment | | R | | R | | R | | R |
| Lanes in Grp | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| Grp Vol (v), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 345 |
| Grp Sat Flow (s), veh/h/ln | 0 | 1583 | 0 | 1583 | 0 | 1583 | 0 | 1583 |
| Q Serve Time (g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24.7 |
| Cycle Q Clear Time (g_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 24.7 |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prot RT Eff Green (g_R), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prop RT Outside Lane (P_R) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Lane Grp Cap (c), veh/h | 0 | 660 | 0 | 433 | 0 | 480 | 0 | 381 |
| V/C Ratio (X) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.91 |
| Avail Cap (c_a), veh/h | 0 | 660 | 0 | 433 | 0 | 487 | 0 | 393 |
| Upstream Filter (I) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Uniform Delay (d1), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 43.1 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25.4 |
| Initial Q Delay (d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 68.5 |
| 1st-Term Q (Q1), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.8 |
| 2nd-Term Q (Q2), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 |
| 3rd-Term Q (Q3), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| %ile Back of Q (50%), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.5 |
| %ile Storage Ratio (RQ%) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 |
| Initial Q (Qb), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final (Residual) Q (Qe), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Delay (ds), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Q (Qs), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Cap (cs), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Q Clear Time (tc), h | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Intersection Summary** | | | | | | | | |
| HCM 2010 Ctrl Delay | | 52.2 | | | | | | |
| HCM 2010 LOS | | D | | | | | | |

**Notes**

User approved ignoring U-Turning movement.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 490 | 310 | 100 | 60 | 330 | 550 | 60 | 1680 | 50 | 690 | 1140 | 290 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q, 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 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 533 | 337 | 30 | 65 | 359 | 0 | 65 | 1826 | 14 | 750 | 1239 | 144 |
| Adj No. of Lanes | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Opposing Right Turn Influence | Yes | | | Yes | | | Yes | | | Yes | | |
| Cap, veh/h | 558 | 1355 | 420 | 105 | 687 | 214 | 105 | 1798 | 558 | 796 | 2819 | 875 |
| 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 |
| Prop Arrive On Green | 0.16 | 0.27 | 0.27 | 0.03 | 0.14 | 0.00 | 0.03 | 0.35 | 0.35 | 0.23 | 0.55 | 0.55 |
| Ln Grp Delay, s/veh | 83.7 | 39.2 | 37.3 | 70.7 | 55.3 | 0.0 | 70.7 | 69.0 | 28.6 | 70.1 | 17.9 | 14.9 |
| Ln Grp LOS | F | D | D | E | E | | E | F | C | E | B | B |
| Approach Vol, veh/h | | 900 | | | 424 | | | 1905 | | | 2133 | |
| Approach Delay, s/veh | | 65.5 | | | 57.6 | | | 68.7 | | | 36.1 | |
| Approach LOS | | E | | | E | | | E | | | D | |

| Timer: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Case No | 2.0 | 3.0 | 2.0 | 3.0 | 2.0 | 3.0 | 2.0 | 3.0 |
| Phs Duration (G+Y+Rc), s | 35.4 | 52.0 | 8.2 | 40.2 | 8.2 | 79.2 | 26.0 | 22.3 |
| Change Period (Y+Rc), s | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Max Green (Gmax), s | 32.0 | 48.0 | 6.0 | 48.0 | 6.0 | 74.0 | 22.0 | 32.0 |
| Max Allow Headway (MAH), s | 3.7 | 4.9 | 3.7 | 5.0 | 3.7 | 4.9 | 3.8 | 5.0 |
| Max Q Clear (g_c+l1), s | 31.1 | 50.0 | 4.5 | 9.1 | 4.5 | 21.5 | 22.8 | 10.9 |
| Green Ext Time (g_e), s | 0.3 | 0.0 | 0.0 | 5.1 | 0.0 | 40.5 | 0.0 | 4.5 |
| Prob of Phs Call (p_c) | 1.00 | 1.00 | 0.91 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 |
| Prob of Max Out (p_x) | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.65 | 1.00 | 0.03 |
| **Left-Turn Movement Data** | | | | | | | | |
| Assigned Mvmt | 1 | | 3 | | 5 | | 7 | |
| Mvmt Sat Flow, veh/h | 3442 | | 3442 | | 3442 | | 3442 | |
| **Through Movement Data** | | | | | | | | |
| Assigned Mvmt | | 2 | | 4 | | 6 | | 8 |
| Mvmt Sat Flow, veh/h | | 5085 | | 5085 | | 5085 | | 5085 |
| **Right-Turn Movement Data** | | | | | | | | |
| Assigned Mvmt | | 12 | | 14 | | 16 | | 18 |
| Mvmt Sat Flow, veh/h | | 1577 | | 1574 | | 1579 | | 1583 |
| **Left Lane Group Data** | | | | | | | | |
| Assigned Mvmt | 1 | 0 | 3 | 0 | 5 | 0 | 7 | 0 |
| Lane Assignment | (Prot) | | (Prot) | | (Prot) | | (Prot) | |
| Lanes in Grp | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grp Vol (v), veh/h | 750 | 0 | 65 | 0 | 65 | 0 | 533 | 0 |
| Grp Sat Flow (s), veh/h/ln | 1721 | 0 | 1721 | 0 | 1721 | 0 | 1721 | 0 |
| Q Serve Time (g_s), s | 29.1 | 0.0 | 2.5 | 0.0 | 2.5 | 0.0 | 20.8 | 0.0 |
| Cycle Q Clear Time (g_c), s | 29.1 | 0.0 | 2.5 | 0.0 | 2.5 | 0.0 | 20.8 | 0.0 |
| Perm LT Sat Flow (s_l), veh/h/ln | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Perm LT Eff Green (g_p), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perm LT Serve Time (g_u), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perm LT Q Serve Time (g_ps), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Time to First Blk (g_f), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Serve Time pre Blk (g_fs), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prop LT Inside Lane (P_L) | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| Lane Grp Cap (c), veh/h | 796 | 0 | 105 | 0 | 105 | 0 | 558 | 0 |
| V/C Ratio (X) | 0.94 | 0.00 | 0.62 | 0.00 | 0.62 | 0.00 | 0.96 | 0.00 |
| Avail Cap (c_a), veh/h | 811 | 0 | 152 | 0 | 152 | 0 | 558 | 0 |
| Upstream Filter (I) | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d1), s/veh | 51.3 | 0.0 | 65.0 | 0.0 | 65.0 | 0.0 | 56.4 | 0.0 |
| Incr Delay (d2), s/veh | 18.8 | 0.0 | 5.7 | 0.0 | 5.7 | 0.0 | 27.3 | 0.0 |
| Initial Q Delay (d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (d), s/veh | 70.1 | 0.0 | 70.7 | 0.0 | 70.7 | 0.0 | 83.7 | 0.0 |
| 1st-Term Q (Q1), veh/ln | 13.9 | 0.0 | 1.2 | 0.0 | 1.2 | 0.0 | 9.9 | 0.0 |
| 2nd-Term Q (Q2), veh/ln | 2.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 2.1 | 0.0 |
| 3rd-Term Q (Q3), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile Back of Q Factor (f_B%) | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 15.9 | 0.0 | 1.3 | 0.0 | 1.3 | 0.0 | 12.0 | 0.0 |
| %ile Storage Ratio (RQ%) | 1.62 | 0.00 | 0.13 | 0.00 | 0.13 | 0.00 | 1.22 | 0.00 |
| Initial Q (Qb), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final (Residual) Q (Qe), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Delay (ds), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Q (Qs), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Cap (cs), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Q Clear Time (tc), h | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Middle Lane Group Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | 0 | 2 | 0 | 4 | 0 | 6 | 0 | 8 |
| Lane Assignment | | T | | T | | T | | T |
| Lanes in Grp | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 3 |
| Grp Vol (v), veh/h | 0 | 1826 | 0 | 337 | 0 | 1239 | 0 | 359 |
| Grp Sat Flow (s), veh/h/ln | 0 | 1695 | 0 | 1695 | 0 | 1695 | 0 | 1695 |
| Q Serve Time (g_s), s | 0.0 | 48.0 | 0.0 | 7.1 | 0.0 | 19.5 | 0.0 | 8.9 |
| Cycle Q Clear Time (g_c), s | 0.0 | 48.0 | 0.0 | 7.1 | 0.0 | 19.5 | 0.0 | 8.9 |
| Lane Grp Cap (c), veh/h | 0 | 1798 | 0 | 1355 | 0 | 2819 | 0 | 687 |
| V/C Ratio (X) | 0.00 | 1.02 | 0.00 | 0.25 | 0.00 | 0.44 | 0.00 | 0.52 |
| Avail Cap (c_a), veh/h | 0 | 1798 | 0 | 1798 | 0 | 2819 | 0 | 1199 |
| Upstream Filter (I) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d1), s/veh | 0.0 | 43.9 | 0.0 | 39.1 | 0.0 | 17.8 | 0.0 | 54.6 |
| Incr Delay (d2), s/veh | 0.0 | 25.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.6 |
| Initial Q Delay (d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (d), s/veh | 0.0 | 69.0 | 0.0 | 39.2 | 0.0 | 17.9 | 0.0 | 55.3 |
| 1st-Term Q (Q1), veh/ln | 0.0 | 22.3 | 0.0 | 3.3 | 0.0 | 9.1 | 0.0 | 4.2 |
| 2nd-Term Q (Q2), veh/ln | 0.0 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3rd-Term Q (Q3), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| %ile Back of Q (50%), veh/ln | 0.0 | 26.5 | 0.0 | 3.3 | 0.0 | 9.1 | 0.0 | 4.2 |
| %ile Storage Ratio (RQ%) | 0.00 | 0.69 | 0.00 | 0.17 | 0.00 | 0.67 | 0.00 | 0.08 |
| Initial Q (Qb), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final (Residual) Q (Qe), veh | 0.0 | 6.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Delay (ds), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Q (Qs), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Cap (cs), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Q Clear Time (tc), h | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Right Lane Group Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assigned Mvmt | 0 | 12 | 0 | 14 | 0 | 16 | 0 | 18 |
| Lane Assignment | | R | | R | | R | | R |
| Lanes in Grp | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| Grp Vol (v), veh/h | 0 | 14 | 0 | 30 | 0 | 144 | 0 | 0 |
| Grp Sat Flow (s), veh/h/ln | 0 | 1577 | 0 | 1574 | 0 | 1579 | 0 | 1583 |
| Q Serve Time (g_s), s | 0.0 | 0.8 | 0.0 | 1.9 | 0.0 | 6.1 | 0.0 | 0.0 |
| Cycle Q Clear Time (g_c), s | 0.0 | 0.8 | 0.0 | 1.9 | 0.0 | 6.1 | 0.0 | 0.0 |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prot RT Eff Green (g_R), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Prop RT Outside Lane (P_R) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Lane Grp Cap (c), veh/h | 0 | 558 | 0 | 420 | 0 | 875 | 0 | 214 |
| V/C Ratio (X) | 0.00 | 0.03 | 0.00 | 0.07 | 0.00 | 0.16 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h | 0 | 558 | 0 | 557 | 0 | 875 | 0 | 373 |
| Upstream Filter (I) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh | 0.0 | 28.6 | 0.0 | 37.2 | 0.0 | 14.8 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 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 |
| Control Delay (d), s/veh | 0.0 | 28.6 | 0.0 | 37.3 | 0.0 | 14.9 | 0.0 | 0.0 |
| 1st-Term Q (Q1), veh/ln | 0.0 | 0.3 | 0.0 | 0.8 | 0.0 | 2.6 | 0.0 | 0.0 |
| 2nd-Term Q (Q2), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3rd-Term Q (Q3), veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| %ile Back of Q (50%), veh/ln | 0.0 | 0.3 | 0.0 | 0.8 | 0.0 | 2.6 | 0.0 | 0.0 |
| %ile Storage Ratio (RQ%) | 0.00 | 0.03 | 0.00 | 0.09 | 0.00 | 0.27 | 0.00 | 0.00 |
| Initial Q (Qb), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final (Residual) Q (Qe), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Delay (ds), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Q (Qs), veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sat Cap (cs), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Q Clear Time (tc), h | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

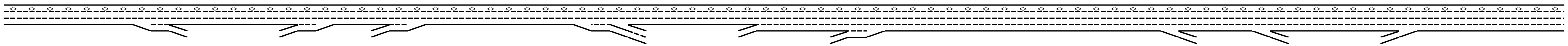
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 54.3 |
| HCM 2010 LOS | D |

# APPENDIX C: FREEWAY ANALYSIS SPREADSHEETS

# Existing Conditions

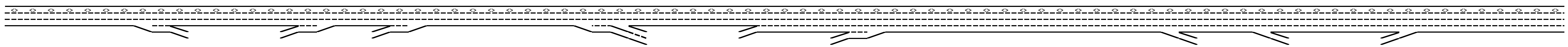
Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Existing Conditions
Time Period: AM Peak Hour



**Key**
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Define Freeway Segment** | | | | | | | | | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Merge | Basic | Diverge | Basic | Basic | Merge | Basic | Basic | Diverge | Diverge | Basic | Merge | Basic |
| Length (ft) | 7,600 | 1,500 | 2,200 | 1,500 | 1,500 | 5,000 | 1,500 | 2,350 | 900 | 1,500 | 2,800 | 4,200 | 1,500 | 830 | 2,000 | 1,500 | 7,500 |
| Accel Length | | | | 300 | 1,235 | | | | | 1,450 | | | | | | 300 | |
| Decel Length | | 400 | | | | | 1,500 | | | | | | 140 | 140 | | | |
| Mainline Volume | 3,258 | 3,258 | 2,526 | 2,526 | 2,547 | 2,748 | 2,748 | 2,001 | 2,001 | 2,551 | 2,625 | 2,625 | 2,625 | 1,599 | 1,260 | 1,260 | 1,765 |
| On Ramp Volume | | | | 21 | 201 | | | | 550 | 74 | | | | | | 505 | |
| Off Ramp Volume | | 732 | | | | | 747 | | | | | | 1,026 | 339 | | | |
| Express Lane Volume | 500 | 241 | 241 | 241 | 241 | 658 | 205 | 205 | 205 | 205 | 114 | 114 | 128 | 74 | 58 | 58 | 102 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | | |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 2,758 | 3,017 | 2,285 | 2,306 | 2,507 | 2,090 | 2,543 | 1,796 | 2,346 | 2,420 | 2,511 | 2,511 | 2,497 | 1,525 | 1,202 | 1,707 | 1,663 |
| PHF | 0.92 | 0.94 | 0.96 | 0.96 | 0.97 | 0.97 | 0.95 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.92 | 0.93 | 0.93 | 0.91 | 0.89 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 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 | 3.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 3.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.870 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 | 0.870 |
| $f_P$ | 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 | 1.00 | 1.00 | 1.00 |
| GP Flow (pcph) | 3,088 | 3,306 | 2,452 | 2,474 | 2,662 | 2,219 | 2,757 | 1,989 | 2,598 | 3,025 | 3,221 | 2,811 | 2,796 | 1,689 | 1,331 | 1,988 | 2,149 |
| GP Flow (pcphpl) | 1,544 | 1,653 | 1,226 | 1,237 | 1,331 | 1,110 | 1,379 | 995 | 866 | 1,008 | 1,074 | 937 | 932 | 563 | 444 | 663 | 716 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | | | | | | |
| Shoulder Width | | | | | | | | | | | | | | | | | |
| TRD | | | | | | | | | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | | | | | | | | | |
| Calculated FFS | | | | | | | | | | | | | | | | | |
| Measured FFS | | | | | | | | | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 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 | 0.70 | 0.52 | 0.53 | 0.57 | 0.47 | 0.59 | 0.42 | 0.37 | 0.43 | 0.46 | 0.40 | 0.40 | 0.24 | 0.19 | 0.28 | 0.30 |
| Speed (mph) | 64.7 | 64.1 | 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 | 65.0 |
| Density (pcphpl) | 23.9 | 25.8 | 18.9 | 19.0 | 20.5 | 17.1 | 21.2 | 15.3 | 13.3 | 15.5 | 16.5 | 14.4 | 14.3 | 8.7 | 6.8 | 10.2 | 11.0 |
| LOS | C | C | C | C | C | B | C | B | B | B | B | B | B | A | A | A | B |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 3,306 | | 2,448 | 2,451 | | 2,757 | | 1,981 | 2,942 | | | 2,796 | 1,689 | | 1,440 | |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{IN}$ v/c ratio | | 0.70 | | 0.52 | 0.52 | | 0.59 | | 0.42 | 0.42 | | | 0.40 | 0.24 | | 0.20 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 2,382 | | 2,474 | 2,662 | | 1,919 | | | 3,025 | | | 1,681 | 1,321 | | 1,988 | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{OUT}$ v/c ratio | | 0.51 | | 0.53 | 0.57 | | 0.41 | | | 0.43 | | | 0.24 | 0.19 | | 0.28 | |



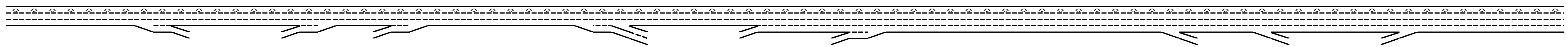
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 500 | 241 | 241 | 241 | 241 | 658 | 205 | 205 | 205 | 205 | 114 | 114 | 128 | 74 | 58 | 58 | 102 |
| PHF | 0.92 | 0.94 | 0.96 | 0.96 | 0.96 | 0.97 | 0.95 | 0.93 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.92 | 0.93 | 0.91 | 0.89 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 2.0% | 2.0% | 2.0% | 2.0% | 0.0% |
| 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% | 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 | 4.5 | 5.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 5.0 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.990 | 0.990 | 0.990 | 0.980 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 | 1.00 |
| EL Flow (pcph) | 543 | 256 | 251 | 251 | 251 | 678 | 216 | 220 | 220 | 220 | 124 | 124 | 141 | 81 | 63 | 65 | 115 |
| EL Flow (pcphpl) | 543 | 256 | 251 | 251 | 251 | 678 | 216 | 220 | 220 | 220 | 124 | 124 | 141 | 81 | 63 | 65 | 115 |
| ***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 | 65.0 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | | |
| $EL_{HL}$ v/c ratio | 0.31 | 0.15 | 0.14 | 0.14 | 0.14 | 0.39 | 0.12 | 0.13 | 0.13 | 0.13 | 0.07 | 0.07 | 0.08 | 0.05 | 0.04 | 0.04 | 0.07 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 21 | 201 | | | | 550 | 74 | | | | | | 505 | |
| PHF | | | | 0.8 | 0.96 | | | | 0.9 | 0.9 | | | | | | 0.93 | |
| Total Lanes | | | | 1 | 1 | | | | 1 | 1 | | | | | | 1 | |
| Terrain | | | | Level | Level | | | | Level | Level | | | | | | Level | |
| Grade % | | | | 2.0% | 2.0% | | | | 2.0% | 2.0% | | | | | | 2.0% | |
| Grade Length (mi) | | | | 0.00 | 0.00 | | | | 0.00 | 0.43 | | | | | | 0.00 | |
| Truck & Bus % | | | | 2.0% | 2.0% | | | | 2.0% | 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 | |
| $f_{HV}$ | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | | | | | | 0.990 | |
| $f_P$ | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | | | | 1.00 | |
| On Flow (pcph) | | | | 27 | 211 | | | | 617 | 83 | | | | | | 548 | |
| On Flow (pcphpl) | | | | 27 | 211 | | | | 617 | 83 | | | | | | 548 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | Right | | | | Right | Right | | | | | | Right | |
| On Ramp Speed (mph) | | | | 35 | 45 | | | | 25 | 45 | | | | | | 35 | |
| On Ramp Cap (pcph) | | | | 2,000 | 2,100 | | | | 1,900 | 2,100 | | | | | | 2,000 | |
| On Ramp v/c ratio | | | | 0.01 | 0.10 | | | | 0.32 | 0.04 | | | | | | 0.27 | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

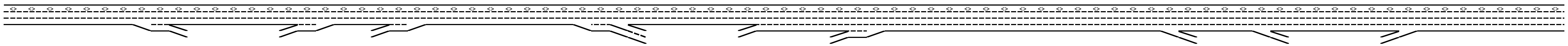


**Key**

<> Express Lane (HOV)

No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 732 | | | | | 747 | | | | | | 1,026 | 339 | | | |
| PHF | | 0.8 | | | | | 0.9 | | | | | | 0.93 | 0.93 | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | | 1 | 1 | | | |
| Terrain | | Level | | | | | Level | | | | | | Level | Level | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | | 2.0% | 2.0% | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.36 | | | | | | 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) | | 924 | | | | | 838 | | | | | | 1,114 | 368 | | | |
| Off Flow (pcphpl) | | 924 | | | | | 419 | | | | | | 1,114 | 368 | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | | Right | Right | | | |
| Off Ramp Speed | | 35 | | | | | 40 | | | | | | 35 | 25 | | | |
| Off Ramp Cap (pcph) | | 2,000 | | | | | 4,000 | | | | | | 2,000 | 1,900 | | | |
| Off Ramp v/c ratio | | 0.46 | | | | | 0.21 | | | | | | 0.56 | 0.19 | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | On | | | On | Off | | Off | |
| Up Distance | | | | | | | | | | 900 | | | 10,000 | 6,630 | | 2,000 | |
| Up Flow (pcph) | | | | | | | | | | 617 | | | 83 | 1,114 | | 368 | |
| Down Type | | | | | | | | | | Off | | | Off | On | | No | |
| Down Distance | | | | | | | | | | 5,800 | | | 2,000 | 2,000 | | | |
| Down Flow (pcph) | | | | | | | | | | 1,114 | | | 548 | 548 | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_F$ (pcph) | | | | 2,448 | 2,451 | | | | | 2,942 | | | | | | 1,440 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | 1,243 | | | | | | -13 | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | 4,209 | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.586 | 0.612 | | | | | 0.618 | | | | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | 0.713 | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | 0.599 | | | | | | | |
| $P_{FM}$ | | | | 1.000 | 1.000 | | | | | 0.618 | | | | | | 0.586 | |
| $v_{12}$ (pcph) | | | | 2,448 | 2,451 | | | | | 1,818 | | | | | | 843 | |
| $v_3$ (pcph) | | | | | | | | | | 1,124 | | | | | | 596 | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 2,448 | 2,451 | | | | | 1,818 | | | | | | 843 | |
| $v_{R12a}$ (pcph) | | | | 2,474 | 2,662 | | | | | 1,901 | | | | | | 1,392 | |
| Merge Speed Index | | | | 0.35 | 0.27 | | | | | 0.22 | | | | | | 0.32 | |
| Merge Area Speed | | | | 57.0 | 58.9 | | | | | 60.0 | | | | | | 57.7 | |
| Outer Lanes Volume | | | | | | | | | | 1,124 | | | | | | 596 | |
| Outer Lanes Speed | | | | | | | | | | 62.8 | | | | | | 64.7 | |
| Segment Speed | | | | 57.0 | 58.9 | | | | | 61.0 | | | | | | 59.7 | |
| Merge v/c ratio | | | | 0.54 | 0.58 | | | | | 0.41 | | | | | | 0.30 | |
| Merge Density | | | | 22.9 | 18.4 | | | | | 11.2 | | | | | | 14.2 | |
| Merge LOS | | | | C | B | | | | | B | | | | | | B | |



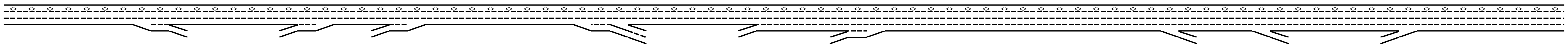
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 3,306 | | | | | 2,757 | | | | | | 2,796 | 1,689 | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | 1,641 | 13,609 | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | 845 | 571 | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.635 | | | | | 0.653 | | | | | | 0.639 | 0.701 | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | 0.613 | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | 0.592 | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | | 0.639 | 0.701 | | | |
| $v_{12}$ (pcph) | | 3,306 | | | | | 2,757 | | | | | | 2,188 | 1,294 | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | 607 | 395 | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 3,306 | | | | | 2,757 | | | | | | 2,188 | 1,294 | | | |
| Diverge Speed Index | | 0.51 | | | | | 0.44 | | | | | | 0.53 | 0.59 | | | |
| Diverge Area Speed | | 53.2 | | | | | 54.9 | | | | | | 52.8 | 51.4 | | | |
| Outer Lanes Volume | | | | | | | | | | | | | 607 | 395 | | | |
| Outer Lanes Speed | | | | | | | | | | | | | 71.3 | 71.3 | | | |
| Segment Speed | | 53.2 | | | | | 54.9 | | | | | | 56.0 | 55.0 | | | |
| Diverge v/c ratio | | 0.75 | | | | | 0.63 | | | | | | 0.50 | 0.29 | | | |
| Diverge Density | | 29.1 | | | | | 14.5 | | | | | | 21.8 | 14.1 | | | |
| Diverge LOS | | D | | | | | B | | | | | | C | B | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

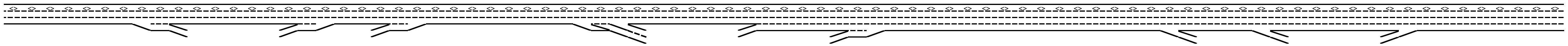


**Key**

<> Express Lane (HOV)

No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.66 | 0.75 | 0.52 | 0.54 | 0.58 | 0.47 | 0.63 | 0.42 | 0.37 | 0.41 | 0.46 | 0.40 | 0.50 | 0.29 | 0.19 | 0.30 | 0.30 |
| Segment Density | 23.9 | 29.1 | 18.9 | 22.9 | 18.4 | 17.1 | 14.5 | 15.3 | 13.3 | 11.2 | 16.5 | 14.4 | 21.8 | 14.1 | 6.8 | 14.2 | 11.0 |
| Segment LOS | C | D | C | C | B | B | B | B | B | B | B | B | C | B | A | B | B |
| Over Capacity | | | | | | | | | | | | | | | | | |

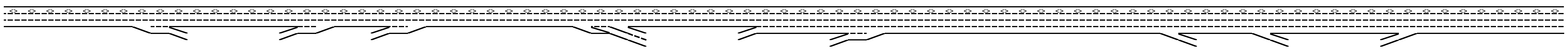


**Key**
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp |
| **Define Freeway Segment** | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Merge | Basic | Diverge | Basic | Basic |
| Length (ft) | 7,600 | 1,500 | 2,200 | 1,500 | 1,500 | 5,000 | 1,500 | 2,350 | 900 |
| Accel Length | | | | 300 | 1,235 | | | | |
| Decel Length | | 400 | | | | | 1,500 | | |
| Mainline Volume | 4,785 | 4,785 | 4,014 | 4,014 | 4,041 | 4,683 | 4,683 | 3,526 | 3,526 |
| On Ramp Volume | | | | 27 | 642 | | | | 1,191 |
| Off Ramp Volume | | 771 | | | | | 1,157 | | |
| Express Lane Volume | 1,200 | 757 | 757 | 757 | 767 | 696 | 624 | 624 | 624 |
| EL On Ramp Volume | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | |
| GP Volume (vph) | 3,585 | 4,028 | 3,257 | 3,284 | 3,916 | 3,988 | 4,059 | 2,902 | 4,093 |
| PHF | 0.98 | 0.99 | 0.99 | 0.96 | 0.94 | 0.91 | 0.95 | 0.98 | 0.98 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GP Flow (pcph) | 3,768 | 4,191 | 3,389 | 3,523 | 4,291 | 4,513 | 4,401 | 3,050 | 4,302 |
| GP Flow (pcphpl) | 1,884 | 2,095 | 1,694 | 1,762 | 2,145 | 2,257 | 2,200 | 1,525 | 1,434 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | |
| Shoulder Width | | | | | | | | | |
| TRD | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | |
| Calculated FFS | | | | | | | | | |
| Measured FFS | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | |
| v/c ratio | 0.80 | 0.89 | 0.72 | 0.75 | 0.91 | 0.96 | 0.94 | 0.65 | 0.61 |
| Speed (mph) | 61.7 | 58.1 | 63.8 | 63.1 | 57.1 | 54.6 | 55.9 | 64.8 | 65.0 |
| Density (pcphpl) | 30.5 | 36.0 | 26.6 | 27.9 | 37.6 | 41.3 | 39.4 | 23.5 | 22.1 |
| LOS | D | E | D | D | E | E | E | C | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 4,191 | | 3,495 | 3,615 | | 4,401 | | 3,087 |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 |
| $GP_{IN}$ v/c ratio | | 0.89 | | 0.74 | 0.77 | | 0.94 | | 0.66 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 3,380 | | 3,523 | 4,291 | | 3,220 | | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | |
| $GP_{OUT}$ v/c ratio | | 0.72 | | 0.75 | 0.91 | | 0.69 | | |

| Location | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|
| Name | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Define Freeway Segment** | | | | | | | | |
| Type | Merge | Basic | Basic | Diverge | Diverge | Basic | Merge | Basic |
| Length (ft) | 1,500 | 2,800 | 4,200 | 1,500 | 830 | 2,000 | 1,500 | 7,500 |
| Accel Length | 1,450 | | | | | | 300 | |
| Decel Length | | | | 140 | 140 | | | |
| Mainline Volume | 4,717 | 4,892 | 4,892 | 4,892 | 4,090 | 3,164 | 3,164 | 4,100 |
| On Ramp Volume | 175 | | | | | | 936 | |
| Off Ramp Volume | | | | 802 | 926 | | | |
| Express Lane Volume | 624 | 500 | 500 | 536 | 448 | 344 | 344 | 430 |
| EL On Ramp Volume | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | |
| GP Volume (vph) | 4,268 | 4,392 | 4,392 | 4,356 | 3,642 | 2,820 | 3,756 | 3,670 |
| PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.98 | 0.98 | 0.98 |
| GP Lanes | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Terrain | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| RV % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| $E_T$ | 3.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 3.5 |
| $E_R$ | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 0.870 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 | 0.870 |
| $f_P$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GP Flow (pcph) | 5,060 | 5,343 | 4,664 | 4,626 | 3,867 | 2,964 | 4,063 | 4,307 |
| GP Flow (pcphpl) | 1,687 | 1,781 | 1,555 | 1,542 | 1,289 | 988 | 1,354 | 1,436 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | |
| Lane Width (ft) | | | | | | | | |
| Shoulder Width | | | | | | | | |
| TRD | | | | | | | | |
| $f_{LW}$ | | | | | | | | |
| $f_{LC}$ | | | | | | | | |
| Calculated FFS | | | | | | | | |
| Measured FFS | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | |
| v/c ratio | 0.72 | 0.76 | 0.66 | 0.66 | 0.55 | 0.42 | 0.58 | 0.61 |
| Speed (mph) | 63.8 | 62.9 | 64.7 | 64.7 | 65.0 | 65.0 | 65.0 | 65.0 |
| Density (pcphpl) | 26.4 | 28.3 | 24.0 | 23.8 | 19.8 | 15.2 | 20.8 | 22.1 |
| LOS | D | D | C | C | C | B | C | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 4,881 | | | 4,626 | 3,867 | | 3,098 | |
| $GP_{IN}$ Cap (pcph) | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{IN}$ v/c ratio | 0.69 | | | 0.66 | 0.55 | | 0.44 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 5,060 | | | 3,799 | 2,912 | | 4,063 | |
| $GP_{OUT}$ Cap (pcph) | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{OUT}$ v/c ratio | 0.72 | | | 0.54 | 0.41 | | 0.58 | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

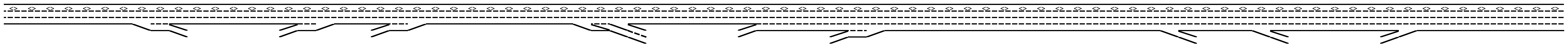


**Key**

<> Express Lane (HOV)

No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 1,200 | 757 | 757 | 757 | 767 | 696 | 624 | 624 | 624 | 624 | 500 | 500 | 536 | 448 | 344 | 344 | 430 |
| PHF | 0.98 | 0.99 | 0.99 | 0.96 | 0.94 | 0.91 | 0.95 | 0.98 | 0.98 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 2.0% | 2.0% | 2.0% | 2.0% | 0.0% |
| 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% | 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 | 4.5 | 5.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 5.0 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.990 | 0.990 | 0.990 | 0.980 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 | 1.00 |
| EL Flow (pcph) | 1,224 | 765 | 765 | 789 | 816 | 764 | 657 | 637 | 637 | 643 | 515 | 515 | 558 | 467 | 355 | 358 | 439 |
| EL Flow (pcphpl) | 1,224 | 765 | 765 | 789 | 816 | 764 | 657 | 637 | 637 | 643 | 515 | 515 | 558 | 467 | 355 | 358 | 439 |
| ***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 | 65.0 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.70 | 0.44 | 0.44 | 0.45 | 0.47 | 0.44 | 0.38 | 0.36 | 0.36 | 0.37 | 0.29 | 0.29 | 0.32 | 0.27 | 0.20 | 0.20 | 0.25 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 27 | 642 | | | | 1,191 | 175 | | | | | | 936 | |
| PHF | | | | 0.96 | 0.96 | | | | 0.99 | 0.99 | | | | | | 0.98 | |
| Total Lanes | | | | 1 | 1 | | | | 1 | 1 | | | | | | 1 | |
| Terrain | | | | Level | Level | | | | Level | Level | | | | | | Level | |
| Grade % | | | | 2.0% | 2.0% | | | | 2.0% | 2.0% | | | | | | 2.0% | |
| Grade Length (mi) | | | | 0.00 | 0.00 | | | | 0.00 | 0.43 | | | | | | 0.00 | |
| Truck & Bus % | | | | 2.0% | 2.0% | | | | 2.0% | 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 | |
| $f_{HV}$ | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | | | | | | 0.990 | |
| $f_P$ | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | | | | 1.00 | |
| On Flow (pcph) | | | | 28 | 675 | | | | 1,215 | 179 | | | | | | 965 | |
| On Flow (pcphpl) | | | | 28 | 675 | | | | 1,215 | 179 | | | | | | 965 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | Right | | | | Right | Right | | | | | | Right | |
| On Ramp Speed (mph) | | | | 35 | 45 | | | | 25 | 45 | | | | | | 35 | |
| On Ramp Cap (pcph) | | | | 2,000 | 2,100 | | | | 1,900 | 2,100 | | | | | | 2,000 | |
| On Ramp v/c ratio | | | | 0.01 | 0.32 | | | | 0.64 | 0.09 | | | | | | 0.48 | |

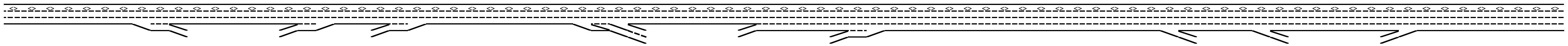


**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 771 | | | | | 1,157 | | | | | | 802 | 926 | | | |
| PHF | | 0.96 | | | | | 0.99 | | | | | | 0.98 | 0.98 | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | | 1 | 1 | | | |
| Terrain | | Level | | | | | Level | | | | | | Level | Level | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | | 2.0% | 2.0% | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.36 | | | | | | 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) | | 811 | | | | | 1,180 | | | | | | 827 | 954 | | | |
| Off Flow (pcphpl) | | 811 | | | | | 590 | | | | | | 827 | 954 | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | | Right | Right | | | |
| Off Ramp Speed | | 35 | | | | | 40 | | | | | | 35 | 25 | | | |
| Off Ramp Cap (pcph) | | 2,000 | | | | | 4,000 | | | | | | 2,000 | 1,900 | | | |
| Off Ramp v/c ratio | | 0.41 | | | | | 0.30 | | | | | | 0.41 | 0.50 | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | On | | | On | Off | | Off | |
| Up Distance | | | | | | | | | | 900 | | | 10,000 | 6,630 | | 2,000 | |
| Up Flow (pcph) | | | | | | | | | | 1,215 | | | 179 | 827 | | 954 | |
| Down Type | | | | | | | | | | Off | | | Off | On | | No | |
| Down Distance | | | | | | | | | | 5,800 | | | 2,000 | 2,000 | | | |
| Down Flow (pcph) | | | | | | | | | | 827 | | | 965 | 965 | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_F$ (pcph) | | | | 3,495 | 3,615 | | | | | 4,881 | | | | | | 3,098 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | 1,678 | | | | | | 431 | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | 3,122 | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.586 | 0.612 | | | | | 0.618 | | | | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | 0.685 | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | 0.586 | | | | | | | |
| $P_{FM}$ | | | | 1.000 | 1.000 | | | | | 0.618 | | | | | | 0.586 | |
| $v_{12}$ (pcph) | | | | 3,495 | 3,615 | | | | | 3,017 | | | | | | 1,815 | |
| $v_3$ (pcph) | | | | | | | | | | 1,864 | | | | | | 1,283 | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 3,495 | 3,615 | | | | | 3,017 | | | | | | 1,815 | |
| $v_{R12a}$ (pcph) | | | | 3,523 | 4,291 | | | | | 3,196 | | | | | | 2,780 | |
| Merge Speed Index | | | | 0.43 | 0.49 | | | | | 0.29 | | | | | | 0.36 | |
| Merge Area Speed | | | | 55.1 | 53.6 | | | | | 58.4 | | | | | | 56.7 | |
| Outer Lanes Volume | | | | | | | | | | 1,864 | | | | | | 1,283 | |
| Outer Lanes Speed | | | | | | | | | | 60.1 | | | | | | 62.2 | |
| Segment Speed | | | | 55.1 | 53.6 | | | | | 59.0 | | | | | | 58.3 | |
| Merge v/c ratio | | | | 0.77 | 0.93 | | | | | 0.69 | | | | | | 0.60 | |
| Merge Density | | | | 31.1 | 30.9 | | | | | 21.2 | | | | | | 24.8 | |
| Merge LOS | | | | D | D | | | | | C | | | | | | C | |



**Key**

<> Express Lane (HOV)

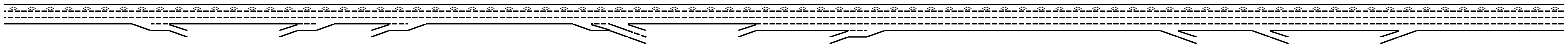
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 4,191 | | | | | 4,401 | | | | | | 4,626 | 3,867 | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | 1,558 | 9,457 | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | 1,384 | 1,431 | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.618 | | | | | 0.596 | | | | | | 0.606 | 0.619 | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | 0.547 | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | 0.579 | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | | 0.606 | 0.619 | | | |
| $v_{12}$ (pcph) | | 4,191 | | | | | 4,401 | | | | | | 3,130 | 2,758 | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | 1,496 | 1,108 | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 4,191 | | | | | 4,401 | | | | | | 3,130 | 2,758 | | | |
| Diverge Speed Index | | 0.50 | | | | | 0.47 | | | | | | 0.50 | 0.64 | | | |
| Diverge Area Speed | | 53.5 | | | | | 54.2 | | | | | | 53.4 | 50.2 | | | |
| Outer Lanes Volume | | | | | | | | | | | | | 1,496 | 1,108 | | | |
| Outer Lanes Speed | | | | | | | | | | | | | 69.4 | 70.9 | | | |
| Segment Speed | | 53.5 | | | | | 54.2 | | | | | | 57.7 | 54.8 | | | |
| Diverge v/c ratio | | 0.95 | | | | | 1.00 | | | | | | 0.71 | 0.63 | | | |
| Diverge Density | | 36.7 | | | | | 28.6 | | | | | | 29.9 | 26.7 | | | |
| Diverge LOS | | E | | | | | F | | | | | | D | C | | | |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Existing Conditions
Time Period: PM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

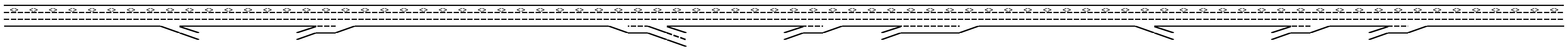


**Key**

<> Express Lane (HOV)

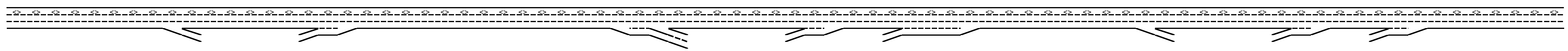
No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.80 | 0.95 | 0.72 | 0.77 | 0.93 | 0.96 | 1.00 | 0.65 | 0.61 | 0.69 | 0.76 | 0.66 | 0.71 | 0.63 | 0.42 | 0.60 | 0.61 |
| Segment Density | 30.5 | 36.7 | 26.6 | 31.1 | 30.9 | 41.3 | - | 23.5 | 22.1 | 21.2 | 28.3 | 24.0 | 29.9 | 26.7 | 15.2 | 24.8 | 22.1 |
| Segment LOS | D | E | D | D | D | E | F | C | C | C | D | C | D | C | B | C | C |
| Over Capacity | | | | | | | Diverge | | | | | | | | | | |



Key
<> Express Lane (HOV)
No Trucks

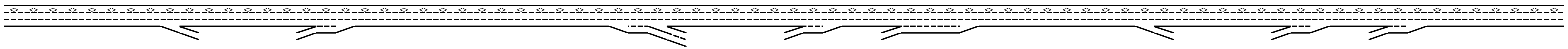
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Merge | Basic |
| Length (ft) | 7,500 | 1,500 | 3,500 | 1,500 | 4,200 | 2,800 | 1,500 | 2,150 | 1,280 | 1,900 | 4,890 | 1,500 | 1,900 | 1,600 | 1,500 | 8,040 |
| Accel Length | | | | 1,155 | | | | | 300 | | | | | 300 | 1,330 | |
| Decel Length | | 140 | | | | | 1,270 | | | | | 140 | | | | |
| Mainline Volume | 3,842 | 3,842 | 2,933 | 2,933 | 4,470 | 4,470 | 4,470 | 3,384 | 3,384 | 3,430 | 4,318 | 4,318 | 3,644 | 3,644 | 3,700 | 4,400 |
| On Ramp Volume | | | | 1,537 | | | | | 46 | 888 | | | | 56 | 700 | |
| Off Ramp Volume | | 909 | | | | | 1,086 | | | | | 674 | | | | |
| Express Lane Volume | 367 | 407 | 309 | 309 | 595 | 595 | 549 | 549 | 549 | 549 | 581 | 613 | 613 | 613 | 580 | 1,300 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 3,475 | 3,435 | 2,624 | 4,161 | 3,875 | 3,875 | 3,921 | 2,835 | 2,881 | 3,769 | 3,737 | 3,705 | 3,031 | 3,087 | 3,820 | 3,100 |
| PHF | 0.89 | 0.91 | 0.93 | 0.94 | 0.96 | 0.96 | 0.96 | 0.95 | 0.94 | 0.94 | 0.93 | 0.95 | 0.97 | 0.98 | 0.98 | 0.99 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.70 | 0.28 | 0.38 | 0.28 | 0.80 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1.00 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 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 | 1.5 | 1.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 4,022 | 3,888 | 2,906 | 4,560 | 4,158 | 4,158 | 4,207 | 3,074 | 3,157 | 4,130 | 4,139 | 4,017 | 3,218 | 3,245 | 4,015 | 3,225 |
| GP Flow (pcphpl) | 2,011 | 1,944 | 1,453 | 2,280 | 2,079 | 2,079 | 2,103 | 1,537 | 1,578 | 1,377 | 2,069 | 2,009 | 1,609 | 1,622 | 2,007 | 1,613 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calculated FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 | 70.0 | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.86 | 0.83 | 0.62 | 0.97 | 0.88 | 0.88 | 0.90 | 0.65 | 0.67 | 0.59 | 0.88 | 0.85 | 0.68 | 0.69 | 0.85 | 0.69 |
| Speed (mph) | 59.7 | 60.8 | 65.0 | 54.0 | 58.5 | 58.5 | 58.0 | 64.7 | 64.5 | 65.0 | 58.6 | 59.7 | 64.4 | 64.3 | 59.8 | 64.4 |
| Density (pcphpl) | 33.7 | 32.0 | 22.4 | 42.2 | 35.6 | 35.6 | 36.3 | 23.7 | 24.5 | 21.2 | 35.3 | 33.6 | 25.0 | 25.2 | 33.6 | 25.1 |
| LOS | D | D | C | E | E | E | E | C | C | C | E | D | C | C | D | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 3,888 | | 2,890 | | | 4,207 | | 3,107 | 3,165 | | 4,017 | | 3,180 | 3,278 | |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{IN}$ v/c ratio | | 0.83 | | 0.61 | | | 0.90 | | 0.66 | 0.67 | | 0.85 | | 0.68 | 0.70 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 2,901 | | 4,560 | | | 3,027 | | 3,157 | 4,130 | | 3,243 | | 3,245 | 4,015 | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{OUT}$ v/c ratio | | 0.62 | | 0.97 | | | 0.64 | | 0.67 | 0.88 | | 0.69 | | 0.69 | 0.85 | |



Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 367 | 407 | 309 | 309 | 595 | 595 | 549 | 549 | 549 | 549 | 581 | 613 | 613 | 613 | 580 | 1,300 |
| PHF | 0.89 | 0.91 | 0.93 | 0.94 | 0.96 | 0.96 | 0.96 | 0.95 | 0.94 | 0.94 | 0.93 | 0.95 | 0.97 | 0.98 | 0.98 | 0.99 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.7 | 0.28 | 0.38 | 0.28 | 0.8 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 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% | 0.0% | 0.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 412 | 447 | 332 | 328 | 620 | 620 | 572 | 578 | 584 | 584 | 625 | 645 | 632 | 626 | 592 | 1,313 |
| EL Flow (pcphpl) | 412 | 447 | 332 | 328 | 620 | 620 | 572 | 578 | 584 | 584 | 625 | 645 | 632 | 626 | 592 | 1,313 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | 0.0 | 1.5 | 1.5 | 1.5 | 1.5 | 0.0 | 0.0 | 0.0 | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calc'd FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | | | | | | | | | | 65.0 | 65.0 | | | | | |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.24 | 0.26 | 0.19 | 0.19 | 0.35 | 0.35 | 0.33 | 0.33 | 0.33 | 0.33 | 0.36 | 0.37 | 0.36 | 0.36 | 0.34 | 0.75 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 1,537 | | | | | 46 | 888 | | | | 56 | 700 | |
| PHF | | | | 0.93 | | | | | 0.93 | 0.93 | | | | 0.88 | 0.96 | |
| Total Lanes | | | | 1 | | | | | 1 | 1 | | | | 1 | 1 | |
| Terrain | | | | Level | | | | | Level | Level | | | | Level | Level | |
| Grade % | | | | 2.0% | | | | | 2.0% | 2.0% | | | | 2.0% | 2.0% | |
| Grade Length (mi) | | | | 0.00 | | | | | 0.33 | 0.47 | | | | 0.00 | 0.00 | |
| Truck & Bus % | | | | 2.0% | | | | | 2.0% | 2.0% | | | | 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 | |
| $f_{HV}$ | | | | 0.990 | | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | |
| $f_P$ | | | | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | |
| On Flow (pcph) | | | | 1,669 | | | | | 50 | 964 | | | | 64 | 736 | |
| On Flow (pcphpl) | | | | 1,669 | | | | | 50 | 964 | | | | 64 | 736 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | | | | | Right | Right | | | | Right | Right | |
| On Ramp Speed (mph) | | | | 35 | | | | | 25 | 45 | | | | 25 | 35 | |
| On Ramp Cap (pcph) | | | | 2,000 | | | | | 1,900 | 2,100 | | | | 1,900 | 2,000 | |
| On Ramp v/c ratio | | | | 0.83 | | | | | 0.03 | 0.46 | | | | 0.03 | 0.37 | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



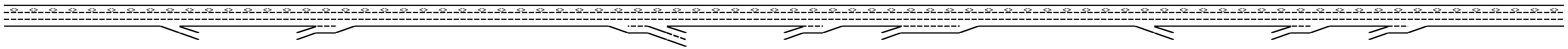
**Key**

<> Express Lane (HOV)

No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 909 | | | | | 1,086 | | | | | 674 | | | | |
| PHF | | 0.93 | | | | | 0.93 | | | | | 0.88 | | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | 1 | | | | |
| Terrain | | Level | | | | | Level | | | | | Level | | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | 2.0% | | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.31 | | | | | 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 | | | | |
| $f_{HV}$ | | 0.990 | | | | | 0.990 | | | | | 0.990 | | | | |
| $f_P$ | | 1.00 | | | | | 1.00 | | | | | 1.00 | | | | |
| Off Flow (pcph) | | 987 | | | | | 1,179 | | | | | 774 | | | | |
| Off Flow (pcphpl) | | 987 | | | | | 590 | | | | | 774 | | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | Right | | | | |
| Off Ramp Speed | | 25 | | | | | 40 | | | | | 40 | | | | |
| Off Ramp Cap (pcph) | | 1,900 | | | | | 4,000 | | | | | 2,000 | | | | |
| Off Ramp v/c ratio | | 0.52 | | | | | 0.29 | | | | | 0.39 | | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | | | | | |
| Up Distance | | | | | | | | | | | | | | | | |
| Up Flow (pcph) | | | | | | | | | | | | | | | | |
| Down Type | | | | | | | | | | | | | | | | |
| Down Distance | | | | | | | | | | | | | | | | |
| Down Flow (pcph) | | | | | | | | | | | | | | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | 2,890 | | | | | 3,107 | | | | | 3,180 | 3,278 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.610 | | | | | 0.586 | | | | | 0.586 | 0.615 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | 1.000 | | | | | 1.000 | | | | | 1.000 | 1.000 | |
| $v_{12}$ (pcph) | | | | 2,890 | | | | | 3,107 | | | | | 3,180 | 3,278 | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 2,890 | | | | | 3,107 | | | | | 3,180 | 3,278 | |
| $v_{R12a}$ (pcph) | | | | 4,560 | | | | | 3,157 | | | | | 3,245 | 4,015 | |
| Merge Speed Index | | | | 0.61 | | | | | 0.40 | | | | | 0.41 | 0.44 | |
| Merge Area Speed | | | | 50.9 | | | | | 55.9 | | | | | 55.7 | 54.8 | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | | | 50.9 | | | | | 55.9 | | | | | 55.7 | 54.8 | |
| Merge v/c ratio | | | | 0.99 | | | | | 0.69 | | | | | 0.71 | 0.87 | |
| Merge Density | | | | 33.0 | | | | | 28.2 | | | | | 28.9 | 28.1 | |
| Merge LOS | | | | D | | | | | D | | | | | D | D | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

<> Express Lane (HOV)

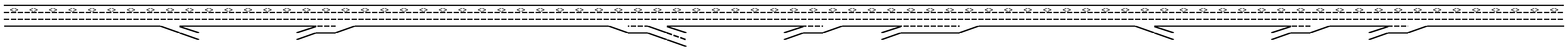
No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 3,888 | | | | | 4,207 | | | | | 4,017 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.617 | | | | | 0.601 | | | | | 0.624 | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | 1.000 | | | | |
| $v_{12}$ (pcph) | | 3,888 | | | | | 4,207 | | | | | 4,017 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 3,888 | | | | | 4,207 | | | | | 4,017 | | | | |
| Diverge Speed Index | | 0.65 | | | | | 0.47 | | | | | 0.43 | | | | |
| Diverge Area Speed | | 50.1 | | | | | 54.2 | | | | | 55.0 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | 50.1 | | | | | 54.2 | | | | | 55.0 | | | | |
| Diverge v/c ratio | | 0.88 | | | | | 0.96 | | | | | 0.91 | | | | |
| Diverge Density | | 36.4 | | | | | 29.0 | | | | | 37.5 | | | | |
| Diverge LOS | | E | | | | | D | | | | | E | | | | |

Project:  Russell Ranch
Freeway Corridor:  Westbound US 50

Alternative: Existing Conditions
Time Period:  AM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

<> Express Lane (HOV)

No Trucks

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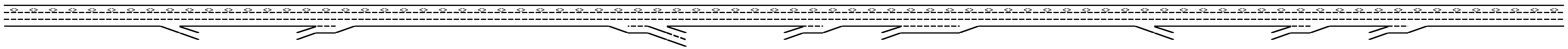
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.86 | 0.88 | 0.62 | 0.99 | 0.88 | 0.88 | 0.96 | 0.65 | 0.69 | 0.59 | 0.88 | 0.91 | 0.68 | 0.71 | 0.87 | 0.69 |
| Segment Density | 33.7 | 36.4 | 22.4 | 33.0 | 35.6 | 35.6 | 29.0 | 23.7 | 28.2 | 21.2 | 35.3 | 37.5 | 25.0 | 28.9 | 28.1 | 25.1 |
| Segment LOS | D | E | C | D | E | E | D | C | D | C | E | E | C | D | D | C |
| Over Capacity | | | | | | | | | | | | | | | | |

Project: Russell Ranch
Freeway Corridor: Westbound US 50

Alternative: Existing Conditions
Time Period: PM Peak Hour



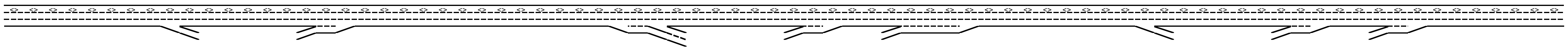
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Merge | Basic |
| Length (ft) | 7,500 | 1,500 | 3,500 | 1,500 | 4,200 | 2,800 | 1,500 | 2,150 | 1,280 | 1,900 | 4,890 | 1,500 | 1,900 | 1,600 | 1,500 | 8,040 |
| Accel Length | | | | 1,155 | | | | | 300 | | | | | 300 | 1,330 | |
| Decel Length | | 140 | | | | | 1,270 | | | | | 140 | | | | |
| Mainline Volume | 2,287 | 2,287 | 1,746 | 1,746 | 3,276 | 3,276 | 3,276 | 2,212 | 2,212 | 2,325 | 3,053 | 3,053 | 2,676 | 2,676 | 2,714 | 3,449 |
| On Ramp Volume | | | | 1,530 | | | | | 113 | 728 | | | | 38 | 735 | |
| Off Ramp Volume | | 541 | | | | | 1,064 | | | | | 377 | | | | |
| Express Lane Volume | 240 | 180 | 135 | 135 | 319 | 319 | 297 | 297 | 297 | 297 | 663 | 336 | 336 | 336 | 339 | 700 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 2,047 | 2,107 | 1,611 | 3,141 | 2,957 | 2,957 | 2,979 | 1,915 | 2,028 | 2,756 | 2,390 | 2,717 | 2,340 | 2,378 | 3,110 | 2,749 |
| PHF | 0.84 | 0.86 | 0.88 | 0.89 | 0.91 | 0.91 | 0.92 | 0.92 | 0.94 | 0.96 | 0.98 | 0.96 | 0.93 | 0.93 | 0.92 | 0.92 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.70 | 0.28 | 0.38 | 0.28 | 0.80 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1.00 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 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 | 1.5 | 1.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 2,510 | 2,524 | 1,886 | 3,636 | 3,347 | 3,347 | 3,335 | 2,144 | 2,222 | 2,957 | 2,512 | 2,915 | 2,592 | 2,634 | 3,482 | 3,078 |
| GP Flow (pcphpl) | 1,255 | 1,262 | 943 | 1,818 | 1,673 | 1,673 | 1,668 | 1,072 | 1,111 | 986 | 1,256 | 1,458 | 1,296 | 1,317 | 1,741 | 1,539 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calculated FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 | 70.0 | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.53 | 0.54 | 0.40 | 0.77 | 0.71 | 0.71 | 0.71 | 0.46 | 0.47 | 0.42 | 0.53 | 0.62 | 0.55 | 0.56 | 0.74 | 0.65 |
| Speed (mph) | 65.0 | 65.0 | 65.0 | 62.5 | 63.9 | 63.9 | 64.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 63.4 | 64.7 |
| Density (pcphpl) | 19.3 | 19.4 | 14.5 | 29.1 | 26.2 | 26.2 | 26.1 | 16.5 | 17.1 | 15.2 | 19.3 | 22.4 | 19.9 | 20.3 | 27.5 | 23.8 |
| LOS | C | C | B | D | D | D | D | B | B | B | C | C | C | C | D | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 2,524 | | 2,059 | | | 3,335 | | 2,103 | 2,191 | | 2,915 | | 2,594 | 2,709 | |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{IN}$ v/c ratio | | 0.54 | | 0.44 | | | 0.71 | | 0.45 | 0.47 | | 0.62 | | 0.55 | 0.58 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 1,966 | | 3,636 | | | 2,216 | | 2,222 | 2,957 | | 2,518 | | 2,634 | 3,482 | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{OUT}$ v/c ratio | | 0.42 | | 0.77 | | | 0.47 | | 0.47 | 0.63 | | 0.54 | | 0.56 | 0.74 | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

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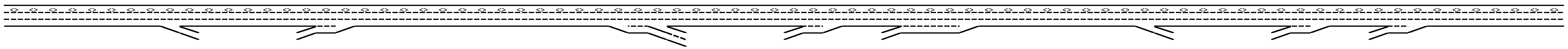
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 240 | 180 | 135 | 135 | 319 | 319 | 297 | 297 | 297 | 297 | 663 | 336 | 336 | 336 | 339 | 700 |
| PHF | 0.84 | 0.86 | 0.88 | 0.89 | 0.91 | 0.91 | 0.92 | 0.92 | 0.94 | 0.96 | 0.98 | 0.96 | 0.93 | 0.93 | 0.92 | 0.92 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.7 | 0.28 | 0.38 | 0.28 | 0.8 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 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% | 0.0% | 0.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 286 | 209 | 153 | 151 | 351 | 351 | 323 | 323 | 316 | 309 | 677 | 350 | 361 | 361 | 368 | 761 |
| EL Flow (pcphpl) | 286 | 209 | 153 | 151 | 351 | 351 | 323 | 323 | 316 | 309 | 677 | 350 | 361 | 361 | 368 | 761 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | 0.0 | 1.5 | 1.5 | 1.5 | 1.5 | 0.0 | 0.0 | 0.0 | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calc'd FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | | | | | | | | | | 65.0 | 65.0 | | | | | |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.16 | 0.12 | 0.09 | 0.09 | 0.20 | 0.20 | 0.18 | 0.18 | 0.18 | 0.18 | 0.39 | 0.20 | 0.21 | 0.21 | 0.21 | 0.43 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 1,530 | | | | | 113 | 728 | | | | 38 | 735 | |
| PHF | | | | 0.98 | | | | | 0.96 | 0.96 | | | | 0.96 | 0.96 | |
| Total Lanes | | | | 1 | | | | | 1 | 1 | | | | 1 | 1 | |
| Terrain | | | | Level | | | | | Level | Level | | | | Level | Level | |
| Grade % | | | | 2.0% | | | | | 2.0% | 2.0% | | | | 2.0% | 2.0% | |
| Grade Length (mi) | | | | 0.00 | | | | | 0.33 | 0.47 | | | | 0.00 | 0.00 | |
| Truck & Bus % | | | | 2.0% | | | | | 2.0% | 2.0% | | | | 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 | |
| $f_{HV}$ | | | | 0.990 | | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | |
| $f_P$ | | | | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | |
| On Flow (pcph) | | | | 1,577 | | | | | 119 | 766 | | | | 40 | 773 | |
| On Flow (pcphpl) | | | | 1,577 | | | | | 119 | 766 | | | | 40 | 773 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | | | | | Right | Right | | | | Right | Right | |
| On Ramp Speed (mph) | | | | 35 | | | | | 25 | 45 | | | | 25 | 35 | |
| On Ramp Cap (pcph) | | | | 2,000 | | | | | 1,900 | 2,100 | | | | 1,900 | 2,000 | |
| On Ramp v/c ratio | | | | 0.79 | | | | | 0.06 | 0.36 | | | | 0.02 | 0.39 | |

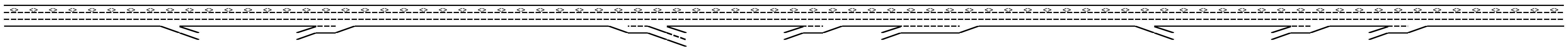
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 541 | | | | | 1,064 | | | | | 377 | | | | |
| PHF | | 0.98 | | | | | 0.96 | | | | | 0.96 | | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | 1 | | | | |
| Terrain | | Level | | | | | Level | | | | | Level | | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | 2.0% | | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.31 | | | | | 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 | | | | |
| $f_{HV}$ | | 0.990 | | | | | 0.990 | | | | | 0.990 | | | | |
| $f_P$ | | 1.00 | | | | | 1.00 | | | | | 1.00 | | | | |
| Off Flow (pcph) | | 558 | | | | | 1,119 | | | | | 397 | | | | |
| Off Flow (pcphpl) | | 558 | | | | | 560 | | | | | 397 | | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | Right | | | | |
| Off Ramp Speed | | 25 | | | | | 40 | | | | | 40 | | | | |
| Off Ramp Cap (pcph) | | 1,900 | | | | | 4,000 | | | | | 2,000 | | | | |
| Off Ramp v/c ratio | | 0.29 | | | | | 0.28 | | | | | 0.20 | | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ra** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | | | | | |
| Up Distance | | | | | | | | | | | | | | | | |
| Up Flow (pcph) | | | | | | | | | | | | | | | | |
| Down Type | | | | | | | | | | | | | | | | |
| Down Distance | | | | | | | | | | | | | | | | |
| Down Flow (pcph) | | | | | | | | | | | | | | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_F$ (pcph) | | | | 2,059 | | | | | 2,103 | | | | | 2,594 | 2,709 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.610 | | | | | 0.586 | | | | | 0.586 | 0.615 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | 1.000 | | | | | 1.000 | | | | | 1.000 | 1.000 | |
| $v_{12}$ (pcph) | | | | 2,059 | | | | | 2,103 | | | | | 2,594 | 2,709 | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 2,059 | | | | | 2,103 | | | | | 2,594 | 2,709 | |
| $v_{R12a}$ (pcph) | | | | 3,636 | | | | | 2,222 | | | | | 2,634 | 3,482 | |
| Merge Speed Index | | | | 0.39 | | | | | 0.34 | | | | | 0.36 | 0.35 | |
| Merge Area Speed | | | | 56.1 | | | | | 57.1 | | | | | 56.7 | 56.8 | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | | | 56.1 | | | | | 57.1 | | | | | 56.7 | 56.8 | |
| Merge v/c ratio | | | | 0.79 | | | | | 0.48 | | | | | 0.57 | 0.76 | |
| Merge Density | | | | 25.9 | | | | | 20.9 | | | | | 24.1 | 23.9 | |
| Merge LOS | | | | C | | | | | C | | | | | C | C | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

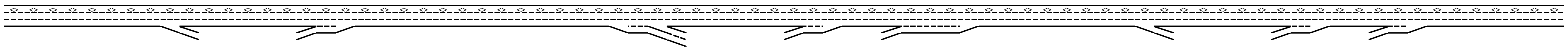


**Key**

<> Express Lane (HOV)

No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 2,524 | | | | | 3,335 | | | | | 2,915 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.671 | | | | | 0.625 | | | | | 0.669 | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | 1.000 | | | | |
| $v_{12}$ (pcph) | | 2,524 | | | | | 3,335 | | | | | 2,915 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 2,524 | | | | | 3,335 | | | | | 2,915 | | | | |
| Diverge Speed Index | | 0.61 | | | | | 0.46 | | | | | 0.40 | | | | |
| Diverge Area Speed | | 51.0 | | | | | 54.3 | | | | | 55.8 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | 51.0 | | | | | 54.3 | | | | | 55.8 | | | | |
| Diverge v/c ratio | | 0.57 | | | | | 0.76 | | | | | 0.66 | | | | |
| Diverge Density | | 24.7 | | | | | 21.5 | | | | | 28.1 | | | | |
| Diverge LOS | | C | | | | | C | | | | | D | | | | |



**Key**

<> Express Lane (HOV)

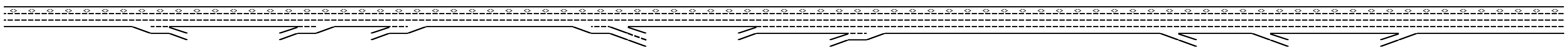
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.53 | 0.57 | 0.40 | 0.79 | 0.71 | 0.71 | 0.76 | 0.46 |
| Segment Density | 19.3 | 24.7 | 14.5 | 25.9 | 26.2 | 26.2 | 21.5 | 16.5 |
| Segment LOS | C | C | B | C | D | D | C | B |
| Over Capacity | | | | | | | | |

| Location | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Name | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.48 | 0.42 | 0.53 | 0.66 | 0.55 | 0.57 | 0.76 | 0.65 |
| Segment Density | 20.9 | 15.2 | 19.3 | 28.1 | 19.9 | 24.1 | 23.9 | 23.8 |
| Segment LOS | C | B | C | D | C | C | C | C |
| Over Capacity | | | | | | | | |

# <u>Existing Plus Project Conditions</u>

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

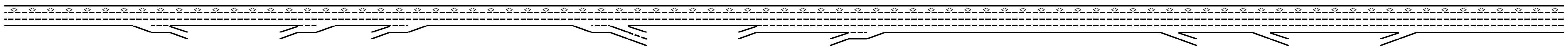


Key
<> Express Lane (HOV)
No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Merge | Basic | Diverge | Basic | Basic | Merge | Basic | Basic | Diverge | Diverge | Basic | Merge | Basic |
| Length (ft) | 7,600 | 1,500 | 2,200 | 1,500 | 1,500 | 5,000 | 1,500 | 2,350 | 900 | 1,500 | 2,800 | 4,200 | 1,500 | 830 | 2,000 | 1,500 | 7,500 |
| Accel Length | | | | 300 | 1,235 | | | | | 1,450 | | | | | | 300 | |
| Decel Length | | 400 | | | | | 1,500 | | | | | | 140 | 140 | | | |
| Mainline Volume | 3,280 | 3,280 | 2,510 | 2,510 | 2,530 | 2,710 | 2,710 | 1,425 | 1,425 | 2,625 | 2,825 | 2,825 | 2,825 | 1,795 | 1,455 | 1,455 | 1,715 |
| On Ramp Volume | | | | 20 | 180 | | | | 1,200 | 200 | | | | | | 260 | |
| Off Ramp Volume | | 770 | | | | | 1,285 | | | | | | 1,030 | 340 | | | |
| Express Lane Volume | 503 | 243 | 239 | 239 | 239 | 649 | 202 | 146 | 146 | 211 | 123 | 123 | 138 | 83 | 67 | 67 | 99 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | | |
| | 0.15 | 0.07 | 0.1 | 0.1 | 0.09 | 0.24 | 0.07 | 0.1 | 0.1 | 0.08 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 2,777 | 3,037 | 2,271 | 2,291 | 2,471 | 2,061 | 2,508 | 1,279 | 2,479 | 2,614 | 2,702 | 2,702 | 2,687 | 1,712 | 1,388 | 1,648 | 1,616 |
| PHF | 0.92 | 0.94 | 0.96 | 0.96 | 0.97 | 0.97 | 0.95 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.92 | 0.93 | 0.93 | 0.91 | 0.89 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 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 | 3.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 3.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.870 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 | 0.870 |
| $f_P$ | 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 | 1.00 | 1.00 | 1.00 |
| GP Flow (pcph) | 3,109 | 3,328 | 2,436 | 2,458 | 2,623 | 2,189 | 2,719 | 1,417 | 2,746 | 3,268 | 3,466 | 3,025 | 3,009 | 1,896 | 1,537 | 1,919 | 2,088 |
| GP Flow (pcphpl) | 1,554 | 1,664 | 1,218 | 1,229 | 1,312 | 1,094 | 1,360 | 708 | 915 | 1,089 | 1,155 | 1,008 | 1,003 | 632 | 512 | 640 | 696 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | | | | | | |
| Shoulder Width | | | | | | | | | | | | | | | | | |
| TRD | | | | | | | | | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | | | | | | | | | |
| Calculated FFS | | | | | | | | | | | | | | | | | |
| Measured FFS | | | | | | | | | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 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 | 0.71 | 0.52 | 0.52 | 0.56 | 0.47 | 0.58 | 0.30 | 0.39 | 0.46 | 0.49 | 0.43 | 0.43 | 0.27 | 0.22 | 0.27 | 0.30 |
| Speed (mph) | 64.7 | 64.0 | 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 | 65.0 | 65.0 |
| Density (pcphpl) | 24.0 | 26.0 | 18.7 | 18.9 | 20.2 | 16.8 | 20.9 | 10.9 | 14.1 | 16.8 | 17.8 | 15.5 | 15.4 | 9.7 | 7.9 | 9.8 | 10.7 |
| LOS | C | C | C | C | C | B | C | A | B | B | B | B | B | A | A | A | A |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 3,328 | | 2,432 | 2,434 | | 2,719 | | 1,399 | 3,043 | | | 3,009 | 1,896 | | 1,637 | |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{IN}$ v/c ratio | | 0.71 | | 0.52 | 0.52 | | 0.58 | | 0.30 | 0.43 | | | 0.43 | 0.27 | | 0.23 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 2,356 | | 2,458 | 2,623 | | 1,277 | | | 3,268 | | | 1,890 | 1,527 | | 1,919 | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{OUT}$ v/c ratio | | 0.50 | | 0.52 | 0.56 | | 0.27 | | | 0.46 | | | 0.27 | 0.22 | | 0.27 | |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Existing Plus Project Conditions
Time Period: AM Peak Hour



**Key**

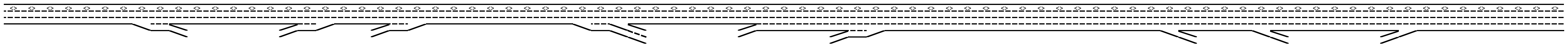
<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 503 | 243 | 239 | 239 | 239 | 649 | 202 | 146 | 146 | 211 | 123 | 123 | 138 | 83 | 67 | 67 | 99 |
| PHF | 0.92 | 0.94 | 0.96 | 0.96 | 0.96 | 0.97 | 0.95 | 0.93 | 0.93 | 0.93 | 0.92 | 0.92 | 0.92 | 0.92 | 0.93 | 0.91 | 0.89 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 2.0% | 2.0% | 2.0% | 2.0% | 0.0% |
| 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% | 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 | 4.5 | 5.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 5.0 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.990 | 0.990 | 0.990 | 0.980 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 | 1.00 |
| EL Flow (pcph) | 547 | 258 | 249 | 249 | 249 | 669 | 213 | 157 | 157 | 227 | 133 | 133 | 151 | 91 | 73 | 75 | 111 |
| EL Flow (pcphpl) | 547 | 258 | 249 | 249 | 249 | 669 | 213 | 157 | 157 | 227 | 133 | 133 | 151 | 91 | 73 | 75 | 111 |
| ***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 | 65.0 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.31 | 0.15 | 0.14 | 0.14 | 0.14 | 0.38 | 0.12 | 0.09 | 0.09 | 0.13 | 0.08 | 0.08 | 0.09 | 0.05 | 0.04 | 0.04 | 0.06 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 20 | 180 | | | | 1,200 | 200 | | | | | | 260 | |
| PHF | | | | 0.8 | 0.96 | | | | 0.9 | 0.9 | | | | | | 0.93 | |
| Total Lanes | | | | 1 | 1 | | | | 1 | 1 | | | | | | 1 | |
| Terrain | | | | Level | Level | | | | Level | Level | | | | | | Level | |
| Grade % | | | | 2.0% | 2.0% | | | | 2.0% | 2.0% | | | | | | 2.0% | |
| Grade Length (mi) | | | | 0.00 | 0.00 | | | | 0.00 | 0.43 | | | | | | 0.00 | |
| Truck & Bus % | | | | 2.0% | 2.0% | | | | 2.0% | 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 | |
| $f_{HV}$ | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | | | | | | 0.990 | |
| $f_P$ | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | | | | 1.00 | |
| On Flow (pcph) | | | | 25 | 189 | | | | 1,347 | 224 | | | | | | 282 | |
| On Flow (pcphpl) | | | | 25 | 189 | | | | 1,347 | 224 | | | | | | 282 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | Right | | | | Right | Right | | | | | | Right | |
| On Ramp Speed (mph) | | | | 35 | 45 | | | | 25 | 45 | | | | | | 35 | |
| On Ramp Cap (pcph) | | | | 2,000 | 2,100 | | | | 1,900 | 2,100 | | | | | | 2,000 | |
| On Ramp v/c ratio | | | | 0.01 | 0.09 | | | | 0.71 | 0.11 | | | | | | 0.14 | |

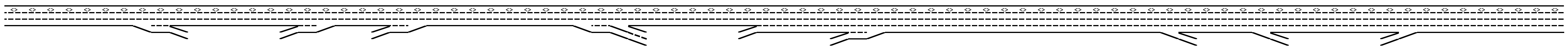
Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Existing Plus Project Conditions
Time Period: AM Peak Hour



Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 770 | | | | | 1,285 | | | | | | 1,030 | 340 | | | |
| PHF | | 0.8 | | | | | 0.9 | | | | | | 0.93 | 0.93 | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | | 1 | 1 | | | |
| Terrain | | Level | | | | | Level | | | | | | Level | Level | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | | 2.0% | 2.0% | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.36 | | | | | | 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) | | 972 | | | | | 1,442 | | | | | | 1,119 | 369 | | | |
| Off Flow (pcphpl) | | 972 | | | | | 721 | | | | | | 1,119 | 369 | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | | Right | Right | | | |
| Off Ramp Speed | | 35 | | | | | 40 | | | | | | 35 | 25 | | | |
| Off Ramp Cap (pcph) | | 2,000 | | | | | 4,000 | | | | | | 2,000 | 1,900 | | | |
| Off Ramp v/c ratio | | 0.49 | | | | | 0.36 | | | | | | 0.56 | 0.19 | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | On | | | On | Off | | Off | |
| Up Distance | | | | | | | | | | 900 | | | 10,000 | 6,630 | | 2,000 | |
| Up Flow (pcph) | | | | | | | | | | 1,347 | | | 224 | 1,119 | | 369 | |
| Down Type | | | | | | | | | | Off | | | Off | On | | No | |
| Down Distance | | | | | | | | | | 5,800 | | | 2,000 | 2,000 | | | |
| Down Flow (pcph) | | | | | | | | | | 1,119 | | | 282 | 282 | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_F$ (pcph) | | | | 2,432 | 2,434 | | | | | 3,043 | | | | | | 1,637 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | 1,294 | | | | | | -28 | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | 4,225 | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.586 | 0.612 | | | | | 0.618 | | | | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | 0.714 | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | 0.599 | | | | | | | |
| $P_{FM}$ | | | | 1.000 | 1.000 | | | | | 0.618 | | | | | | 0.586 | |
| $v_{12}$ (pcph) | | | | 2,432 | 2,434 | | | | | 1,881 | | | | | | 959 | |
| $v_3$ (pcph) | | | | | | | | | | 1,162 | | | | | | 678 | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 2,432 | 2,434 | | | | | 1,881 | | | | | | 959 | |
| $v_{R12a}$ (pcph) | | | | 2,458 | 2,623 | | | | | 2,105 | | | | | | 1,241 | |
| Merge Speed Index | | | | 0.35 | 0.26 | | | | | 0.22 | | | | | | 0.31 | |
| Merge Area Speed | | | | 57.1 | 58.9 | | | | | 59.9 | | | | | | 57.8 | |
| Outer Lanes Volume | | | | | | | | | | 1,162 | | | | | | 678 | |
| Outer Lanes Speed | | | | | | | | | | 62.6 | | | | | | 64.4 | |
| Segment Speed | | | | 57.1 | 58.9 | | | | | 60.8 | | | | | | 60.0 | |
| Merge v/c ratio | | | | 0.53 | 0.57 | | | | | 0.46 | | | | | | 0.27 | |
| Merge Density | | | | 22.8 | 18.1 | | | | | 12.7 | | | | | | 13.1 | |
| Merge LOS | | | | C | B | | | | | B | | | | | | B | |



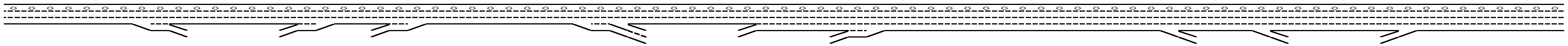
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 3,328 | | | | | 2,719 | | | | | | 3,009 | 1,896 | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | 4,067 | 12,924 | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | 441 | 296 | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.632 | | | | | 0.626 | | | | | | 0.633 | 0.696 | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | 0.613 | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | 0.570 | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | | 0.633 | 0.696 | | | |
| $v_{12}$ (pcph) | | 3,328 | | | | | 2,719 | | | | | | 2,316 | 1,432 | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | 693 | 465 | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 3,328 | | | | | 2,719 | | | | | | 2,316 | 1,432 | | | |
| Diverge Speed Index | | 0.52 | | | | | 0.49 | | | | | | 0.53 | 0.59 | | | |
| Diverge Area Speed | | 53.1 | | | | | 53.7 | | | | | | 52.8 | 51.4 | | | |
| Outer Lanes Volume | | | | | | | | | | | | | 693 | 465 | | | |
| Outer Lanes Speed | | | | | | | | | | | | | 71.3 | 71.3 | | | |
| Segment Speed | | 53.1 | | | | | 53.7 | | | | | | 56.2 | 55.2 | | | |
| Diverge v/c ratio | | 0.76 | | | | | 0.62 | | | | | | 0.53 | 0.33 | | | |
| Diverge Density | | 29.3 | | | | | 14.1 | | | | | | 22.9 | 15.3 | | | |
| Diverge LOS | | D | | | | | B | | | | | | C | B | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

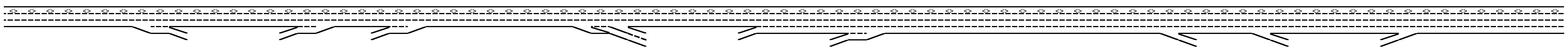


**Key**

<> Express Lane (HOV)

No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.66 | 0.76 | 0.52 | 0.53 | 0.57 | 0.47 | 0.62 | 0.30 | 0.39 | 0.46 | 0.49 | 0.43 | 0.53 | 0.33 | 0.22 | 0.27 | 0.30 |
| Segment Density | 24.0 | 29.3 | 18.7 | 22.8 | 18.1 | 16.8 | 14.1 | 10.9 | 14.1 | 12.7 | 17.8 | 15.5 | 22.9 | 15.3 | 7.9 | 13.1 | 10.7 |
| Segment LOS | C | D | C | C | B | B | B | A | B | B | B | B | C | B | A | B | A |
| Over Capacity | | | | | | | | | | | | | | | | | |



**Key**

<> Express Lane (HOV)

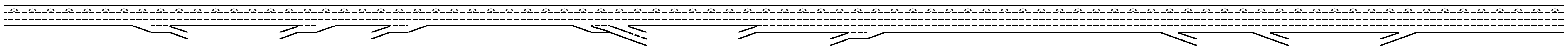
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp |
| **Define Freeway Segment** | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Merge | Basic | Diverge | Basic | Basic |
| Length (ft) | 7,600 | 1,500 | 2,200 | 1,500 | 1,500 | 5,000 | 1,500 | 2,350 | 900 |
| Accel Length | | | | 300 | 1,235 | | | | |
| Decel Length | | 400 | | | | | 1,500 | | |
| Mainline Volume | 4,800 | 4,800 | 4,050 | 4,050 | 4,080 | 4,800 | 4,800 | 3,515 | 3,515 |
| On Ramp Volume | | | | 30 | 720 | | | | 1,200 |
| Off Ramp Volume | | 750 | | | | | 1,285 | | |
| Express Lane Volume | 1,204 | 759 | 764 | 764 | 774 | 713 | 640 | 622 | 622 |
| EL On Ramp Volume | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | |
| | 0.25 | 0.16 | 0.19 | 0.19 | 0.19 | 0.15 | 0.13 | 0.18 | 0.18 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | |
| GP Volume (vph) | 3,596 | 4,041 | 3,286 | 3,316 | 4,026 | 4,087 | 4,160 | 2,893 | 4,093 |
| PHF | 0.98 | 0.99 | 0.99 | 0.96 | 0.94 | 0.91 | 0.95 | 0.98 | 0.98 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Grade | Level |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_p$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GP Flow (pcph) | 3,780 | 4,204 | 3,419 | 3,558 | 4,411 | 4,626 | 4,511 | 3,041 | 4,302 |
| GP Flow (pcphpl) | 1,890 | 2,102 | 1,709 | 1,779 | 2,206 | 2,313 | 2,255 | 1,520 | 1,434 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | |
| Shoulder Width | | | | | | | | | |
| TRD | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | |
| Calculated FFS | | | | | | | | | |
| Measured FFS | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | |
| v/c ratio | 0.80 | 0.89 | 0.73 | 0.76 | 0.94 | 0.98 | 0.96 | 0.65 | 0.61 |
| Speed (mph) | 61.6 | 58.0 | 63.6 | 63.0 | 55.8 | 53.2 | 54.6 | 64.8 | 65.0 |
| Density (pcphpl) | 30.7 | 36.2 | 26.9 | 28.3 | 39.5 | 43.5 | 41.3 | 23.5 | 22.1 |
| LOS | D | E | D | D | E | E | E | C | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 4,204 | | 3,526 | 3,654 | | 4,511 | | 3,078 |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 |
| $GP_{IN}$ v/c ratio | | 0.89 | | 0.75 | 0.78 | | 0.96 | | 0.65 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 3,415 | | 3,558 | 4,411 | | 3,200 | | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | 4,700 | | 4,700 | | |
| $GP_{OUT}$ v/c ratio | | 0.73 | | 0.76 | 0.94 | | 0.68 | | |

| Location | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|
| Name | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Define Freeway Segment** | | | | | | | | |
| Type | Merge | Basic | Basic | Diverge | Diverge | Basic | Merge | Basic |
| Length (ft) | 1,500 | 2,800 | 4,200 | 1,500 | 830 | 2,000 | 1,500 | 7,500 |
| Accel Length | 1,450 | | | | | | 300 | |
| Decel Length | | | | 140 | 140 | | | |
| Mainline Volume | 4,715 | 4,915 | 4,915 | 4,915 | 4,095 | 3,165 | 3,165 | 3,905 |
| On Ramp Volume | 200 | | | | | | 740 | |
| Off Ramp Volume | | | | 820 | 930 | | | |
| Express Lane Volume | 624 | 502 | 502 | 538 | 449 | 344 | 344 | 410 |
| EL On Ramp Volume | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | |
| | 0.13 | 0.1 | 0.1 | 0.11 | 0.11 | 0.11 | 0.11 | 0.1 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | |
| GP Volume (vph) | 4,291 | 4,413 | 4,413 | 4,377 | 3,646 | 2,821 | 3,561 | 3,495 |
| PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.98 | 0.98 | 0.98 |
| GP Lanes | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Terrain | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| RV % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| $E_T$ | 3.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 3.5 |
| $E_R$ | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 0.870 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 | 0.870 |
| $f_p$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GP Flow (pcph) | 5,088 | 5,368 | 4,686 | 4,648 | 3,872 | 2,965 | 3,851 | 4,102 |
| GP Flow (pcphpl) | 1,696 | 1,789 | 1,562 | 1,549 | 1,291 | 988 | 1,284 | 1,367 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | |
| Lane Width (ft) | | | | | | | | |
| Shoulder Width | | | | | | | | |
| TRD | | | | | | | | |
| $f_{LW}$ | | | | | | | | |
| $f_{LC}$ | | | | | | | | |
| Calculated FFS | | | | | | | | |
| Measured FFS | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | |
| v/c ratio | 0.72 | 0.76 | 0.66 | 0.66 | 0.55 | 0.42 | 0.55 | 0.58 |
| Speed (mph) | 63.8 | 62.9 | 64.6 | 64.7 | 65.0 | 65.0 | 65.0 | 65.0 |
| Density (pcphpl) | 26.6 | 28.5 | 24.2 | 23.9 | 19.9 | 15.2 | 19.8 | 21.0 |
| LOS | D | D | C | C | C | B | C | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 4,884 | | | 4,648 | 3,872 | | 3,089 | |
| $GP_{IN}$ Cap (pcph) | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{IN}$ v/c ratio | 0.69 | | | 0.66 | 0.55 | | 0.44 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 5,088 | | | 3,802 | 2,913 | | 3,851 | |
| $GP_{OUT}$ Cap (pcph) | 7,050 | | | 7,050 | 7,050 | | 7,050 | |
| $GP_{OUT}$ v/c ratio | 0.72 | | | 0.54 | 0.41 | | 0.55 | |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

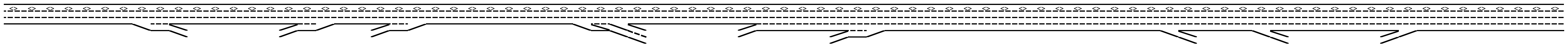
Alternative: Existing Plus Project Conditions
Time Period: PM Peak Hour



Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| ***Calculate Flow Rate in Express Lanes (EL)*** | | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 1,204 | 759 | 764 | 764 | 774 | 713 | 640 | 622 | 622 | 624 | 502 | 502 | 538 | 449 | 344 | 344 | 410 |
| PHF | 0.98 | 0.99 | 0.99 | 0.96 | 0.94 | 0.91 | 0.95 | 0.98 | 0.98 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade | Grade |
| Grade % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.2% | 1.9% | 2.7% | 1.5% | 6.5% | 6.0% | -2.2% | 0.5% | 0.0% | -1.5% | 3.8% | 4.4% |
| Grade Length (mi) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.28 | 0.45 | 0.17 | 0.28 | 0.53 | 0.80 | 0.28 | 0.16 | 0.38 | 0.28 | 1.70 |
| Truck & Bus % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 2.0% | 2.0% | 2.0% | 2.0% | 0.0% |
| 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% | 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 | 4.5 | 5.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 5.0 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 6.0 | 6.0 | 1.2 | 1.2 | 1.2 | 1.2 | 2.5 | 4.5 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.990 | 0.990 | 0.990 | 0.980 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 | 1.00 |
| EL Flow (pcph) | 1,228 | 767 | 772 | 796 | 824 | 783 | 673 | 635 | 635 | 643 | 518 | 518 | 560 | 468 | 355 | 358 | 418 |
| EL Flow (pcphpl) | 1,228 | 767 | 772 | 796 | 824 | 783 | 673 | 635 | 635 | 643 | 518 | 518 | 560 | 468 | 355 | 358 | 418 |
| ***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 | 65.0 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.70 | 0.44 | 0.44 | 0.45 | 0.47 | 0.45 | 0.38 | 0.36 | 0.36 | 0.37 | 0.30 | 0.30 | 0.32 | 0.27 | 0.20 | 0.20 | 0.24 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 30 | 720 | | | | 1,200 | 200 | | | | | | 740 | |
| PHF | | | | 0.96 | 0.96 | | | | 0.99 | 0.99 | | | | | | 0.98 | |
| Total Lanes | | | | 1 | 1 | | | | 1 | 1 | | | | | | 1 | |
| Terrain | | | | Level | Level | | | | Level | Level | | | | | | Level | |
| Grade % | | | | 2.0% | 2.0% | | | | 2.0% | 2.0% | | | | | | 2.0% | |
| Grade Length (mi) | | | | 0.00 | 0.00 | | | | 0.00 | 0.43 | | | | | | 0.00 | |
| Truck & Bus % | | | | 2.0% | 2.0% | | | | 2.0% | 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 | |
| $f_{HV}$ | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | | | | | | 0.990 | |
| $f_P$ | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | | | | | | 1.00 | |
| On Flow (pcph) | | | | 32 | 758 | | | | 1,224 | 204 | | | | | | 763 | |
| On Flow (pcphpl) | | | | 32 | 758 | | | | 1,224 | 204 | | | | | | 763 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | Right | | | | Right | Right | | | | | | Right | |
| On Ramp Speed (mph) | | | | 35 | 45 | | | | 25 | 45 | | | | | | 35 | |
| On Ramp Cap (pcph) | | | | 2,000 | 2,100 | | | | 1,900 | 2,100 | | | | | | 2,000 | |
| On Ramp v/c ratio | | | | 0.02 | 0.36 | | | | 0.64 | 0.10 | | | | | | 0.38 | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

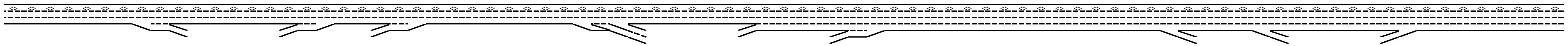


**Key**

<> Express Lane (HOV)

No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 750 | | | | | 1,285 | | | | | | 820 | 930 | | | |
| PHF | | 0.96 | | | | | 0.99 | | | | | | 0.98 | 0.98 | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | | 1 | 1 | | | |
| Terrain | | Level | | | | | Level | | | | | | Level | Level | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | | 2.0% | 2.0% | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.36 | | | | | | 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) | | 789 | | | | | 1,311 | | | | | | 845 | 958 | | | |
| Off Flow (pcphpl) | | 789 | | | | | 655 | | | | | | 845 | 958 | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | | Right | Right | | | |
| Off Ramp Speed | | 35 | | | | | 40 | | | | | | 35 | 25 | | | |
| Off Ramp Cap (pcph) | | 2,000 | | | | | 4,000 | | | | | | 2,000 | 1,900 | | | |
| Off Ramp v/c ratio | | 0.39 | | | | | 0.33 | | | | | | 0.42 | 0.50 | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | On | | | On | Off | | Off | |
| Up Distance | | | | | | | | | | 900 | | | 10,000 | 6,630 | | 2,000 | |
| Up Flow (pcph) | | | | | | | | | | 1,224 | | | 204 | 845 | | 958 | |
| Down Type | | | | | | | | | | Off | | | Off | On | | No | |
| Down Distance | | | | | | | | | | 5,800 | | | 2,000 | 2,000 | | | |
| Down Flow (pcph) | | | | | | | | | | 845 | | | 763 | 763 | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | 3,526 | 3,654 | | | | | 4,884 | | | | | | 3,089 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | 1,684 | | | | | | 386 | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | 3,192 | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.586 | 0.612 | | | | | 0.618 | | | | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | 0.688 | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | 0.587 | | | | | | | |
| $P_{FM}$ | | | | 1.000 | 1.000 | | | | | 0.618 | | | | | | 0.586 | |
| $v_{12}$ (pcph) | | | | 3,526 | 3,654 | | | | | 3,019 | | | | | | 1,810 | |
| $v_3$ (pcph) | | | | | | | | | | 1,865 | | | | | | 1,279 | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 3,526 | 3,654 | | | | | 3,019 | | | | | | 1,810 | |
| $v_{R12a}$ (pcph) | | | | 3,558 | 4,411 | | | | | 3,223 | | | | | | 2,572 | |
| Merge Speed Index | | | | 0.44 | 0.53 | | | | | 0.29 | | | | | | 0.35 | |
| Merge Area Speed | | | | 55.0 | 52.8 | | | | | 58.4 | | | | | | 56.9 | |
| Outer Lanes Volume | | | | | | | | | | 1,865 | | | | | | 1,279 | |
| Outer Lanes Speed | | | | | | | | | | 60.1 | | | | | | 62.2 | |
| Segment Speed | | | | 55.0 | 52.8 | | | | | 59.0 | | | | | | 58.6 | |
| Merge v/c ratio | | | | 0.77 | 0.96 | | | | | 0.70 | | | | | | 0.56 | |
| Merge Density | | | | 31.3 | 31.8 | | | | | 21.4 | | | | | | 23.3 | |
| Merge LOS | | | | D | D | | | | | C | | | | | | C | |



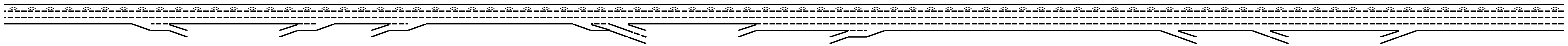
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 4,204 | | | | | 4,511 | | | | | | 4,648 | 3,872 | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | 1,795 | 9,691 | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | 1,106 | 1,134 | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.619 | | | | | 0.587 | | | | | | 0.605 | 0.619 | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | 0.548 | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | 0.566 | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | | 0.605 | 0.619 | | | |
| $v_{12}$ (pcph) | | 4,204 | | | | | 4,511 | | | | | | 3,145 | 2,762 | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | 1,502 | 1,110 | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 4,204 | | | | | 4,511 | | | | | | 3,145 | 2,762 | | | |
| Diverge Speed Index | | 0.50 | | | | | 0.48 | | | | | | 0.50 | 0.64 | | | |
| Diverge Area Speed | | 53.5 | | | | | 53.9 | | | | | | 53.4 | 50.2 | | | |
| Outer Lanes Volume | | | | | | | | | | | | | 1,502 | 1,110 | | | |
| Outer Lanes Speed | | | | | | | | | | | | | 69.3 | 70.9 | | | |
| Segment Speed | | 53.5 | | | | | 53.9 | | | | | | 57.7 | 54.8 | | | |
| Diverge v/c ratio | | 0.96 | | | | | 1.03 | | | | | | 0.71 | 0.63 | | | |
| Diverge Density | | 36.8 | | | | | 29.5 | | | | | | 30.0 | 26.7 | | | |
| Diverge LOS | | E | | | | | F | | | | | | D | C | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

<> Express Lane (HOV)

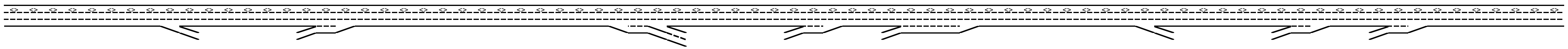
No Trucks

| Name | West of Prairie City Road | Prairie City Off Ramp | Between Prairie City Ramps | Prairie City On Ramp | Prairie City Ramp II | Prairie City to Scott Rd | Scott Rd Off Ramp | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II | Scott Rd to Latrobe Rd I | Scott Rd to Latrobe Rd II | Latrobe Rd Off Ramp | Latrobe Rd Off Ramp II | Between Ramps | Latrobe Rd On Ramp | East of Latrobe Rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.80 | 0.96 | 0.73 | 0.77 | 0.96 | 0.98 | 1.03 | 0.65 | 0.61 | 0.70 | 0.76 | 0.66 | 0.71 | 0.63 | 0.42 | 0.56 | 0.58 |
| Segment Density | 30.7 | 36.8 | 26.9 | 31.3 | 31.8 | 43.5 | - | 23.5 | 22.1 | 21.4 | 28.5 | 24.2 | 30.0 | 26.7 | 15.2 | 23.3 | 21.0 |
| Segment LOS | D | E | D | D | D | E | F | C | C | C | D | C | D | C | B | C | C |
| Over Capacity | | | | | | | Diverge | | | | | | | | | | |

Project: Russell Ranch
Freeway Corridor: Westbound US 50

Alternative: Existing Plus Project Conditions
Time Period: AM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



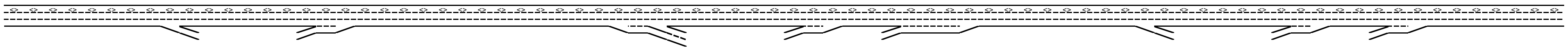
**Key**

› Express Lane (HO'

No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Merge | Basic |
| Length (ft) | 7,500 | 1,500 | 3,500 | 1,500 | 4,200 | 2,800 | 1,500 | 2,150 | 1,280 | 1,900 | 4,890 | 1,500 | 1,900 | 1,600 | 1,500 | 8,040 |
| Accel Length | | | | 1,155 | | | | | 300 | | | | | 300 | 1,330 | |
| Decel Length | | 140 | | | | | 1,270 | | | | | 140 | | | | |
| Mainline Volume | 3,840 | 3,840 | 2,880 | 2,880 | 4,490 | 4,490 | 4,490 | 3,390 | 3,390 | 3,560 | 4,450 | 4,450 | 3,780 | 3,780 | 3,840 | 4,570 |
| On Ramp Volume | | | | 1,610 | | | | | 170 | 890 | | | | 60 | 730 | |
| Off Ramp Volume | | 960 | | | | | 1,100 | | | | | 670 | | | | |
| Express Lane Volume | 367 | 407 | 303 | 303 | 598 | 598 | 551 | 550 | 550 | 570 | 599 | 632 | 636 | 636 | 602 | 1,350 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| | 0.1 | 0.11 | 0.11 | 0.11 | 0.13 | 0.13 | 0.12 | 0.16 | 0.16 | 0.16 | 0.13 | 0.14 | 0.17 | 0.17 | 0.16 | 0.3 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 3,473 | 3,433 | 2,577 | 4,187 | 3,892 | 3,892 | 3,939 | 2,840 | 3,010 | 3,880 | 3,851 | 3,818 | 3,144 | 3,204 | 3,968 | 3,220 |
| PHF | 0.89 | 0.91 | 0.93 | 0.94 | 0.96 | 0.96 | 0.96 | 0.95 | 0.94 | 0.94 | 0.93 | 0.95 | 0.97 | 0.98 | 0.98 | 0.99 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.70 | 0.28 | 0.38 | 0.28 | 0.80 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1.00 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 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 | 1.5 | 1.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 4,020 | 3,886 | 2,854 | 4,588 | 4,176 | 4,176 | 4,226 | 3,079 | 3,298 | 4,252 | 4,265 | 4,140 | 3,339 | 3,368 | 4,171 | 3,350 |
| GP Flow (pcphpl) | 2,010 | 1,943 | 1,427 | 2,294 | 2,088 | 2,088 | 2,113 | 1,540 | 1,649 | 1,417 | 2,133 | 2,070 | 1,669 | 1,684 | 2,085 | 1,675 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calculated FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 | 70.0 | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.86 | 0.83 | 0.61 | 0.98 | 0.89 | 0.89 | 0.90 | 0.66 | 0.70 | 0.60 | 0.91 | 0.88 | 0.71 | 0.72 | 0.89 | 0.71 |
| Speed (mph) | 59.7 | 60.8 | 65.0 | 53.7 | 58.3 | 58.3 | 57.8 | 64.7 | 64.1 | 65.0 | 57.4 | 58.6 | 64.0 | 63.9 | 58.3 | 63.9 |
| Density (pcphpl) | 33.6 | 31.9 | 22.0 | 42.7 | 35.8 | 35.8 | 36.6 | 23.8 | 25.7 | 21.8 | 37.2 | 35.3 | 26.1 | 26.4 | 35.7 | 26.2 |
| LOS | D | D | C | E | E | E | E | C | C | C | E | E | D | D | E | D |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 3,886 | | 2,839 | | | 4,226 | | 3,114 | 3,285 | | 4,140 | | 3,299 | 3,402 | |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{IN}$ v/c ratio | | 0.83 | | 0.60 | | | 0.90 | | 0.66 | 0.70 | | 0.88 | | 0.70 | 0.72 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 2,843 | | 4,588 | | | 3,031 | | 3,298 | 4,252 | | 3,371 | | 3,368 | 4,171 | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{OUT}$ v/c ratio | | 0.60 | | 0.98 | | | 0.64 | | 0.70 | 0.90 | | 0.72 | | 0.72 | 0.89 | |

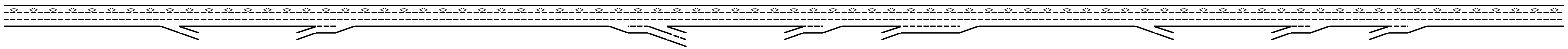
| **Location** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
> Express Lane (HO'
No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 367 | 407 | 303 | 303 | 598 | 598 | 551 | 550 | 550 | 570 | 599 | 632 | 636 | 636 | 602 | 1,350 |
| PHF | 0.89 | 0.91 | 0.93 | 0.94 | 0.96 | 0.96 | 0.96 | 0.95 | 0.94 | 0.94 | 0.93 | 0.95 | 0.97 | 0.98 | 0.98 | 0.99 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.7 | 0.28 | 0.38 | 0.28 | 0.8 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 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% | 0.0% | 0.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 412 | 447 | 326 | 323 | 623 | 623 | 574 | 579 | 585 | 606 | 644 | 665 | 656 | 649 | 614 | 1,364 |
| EL Flow (pcphpl) | 412 | 447 | 326 | 323 | 623 | 623 | 574 | 579 | 585 | 606 | 644 | 665 | 656 | 649 | 614 | 1,364 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | 0.0 | 1.5 | 1.5 | 1.5 | 1.5 | 0.0 | 0.0 | 0.0 | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calc'd FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | | | | | | | | | | 65.0 | 65.0 | | | | | |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.24 | 0.26 | 0.19 | 0.18 | 0.36 | 0.36 | 0.33 | 0.33 | 0.33 | 0.35 | 0.37 | 0.38 | 0.37 | 0.37 | 0.35 | 0.78 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | | | | 1,610 | | | | | 170 | 890 | | | | 60 | 730 | |
| PHF | | | | 0.93 | | | | | 0.93 | 0.93 | | | | 0.88 | 0.96 | |
| Total Lanes | | | | 1 | | | | | 1 | 1 | | | | 1 | 1 | |
| Terrain | | | | Level | | | | | Level | Level | | | | Level | Level | |
| Grade % | | | | 2.0% | | | | | 2.0% | 2.0% | | | | 2.0% | 0.0% | |
| Grade Length (mi) | | | | 0.00 | | | | | 0.33 | 0.47 | | | | 0.00 | 0.00 | |
| Truck & Bus % | | | | 2.0% | | | | | 2.0% | 2.0% | | | | 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 | |
| $f_{HV}$ | | | | 0.990 | | | | | 0.990 | 0.990 | | | | 0.990 | 0.990 | |
| $f_P$ | | | | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | 1.00 | |
| On Flow (pcph) | | | | 1,748 | | | | | 185 | 967 | | | | 69 | 768 | |
| On Flow (pcphpl) | | | | 1,748 | | | | | 185 | 967 | | | | 69 | 768 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | | | | Right | | | | | Right | Right | | | | Right | Right | |
| n Ramp Speed (mp | | | | 35 | | | | | 25 | 45 | | | | 25 | 35 | |
| On Ramp Cap (pcph | | | | 2,000 | | | | | 1,900 | 2,100 | | | | 1,900 | 2,000 | |
| On Ramp v/c ratio | | | | 0.87 | | | | | 0.10 | 0.46 | | | | 0.04 | 0.38 | |

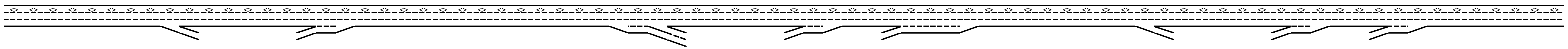
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
Express Lane (HO
No Trucks

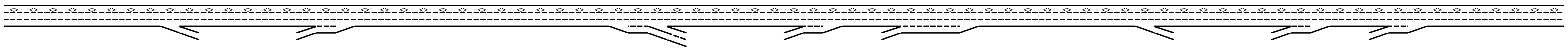
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 960 | | | | | 1,100 | | | | | 670 | | | | |
| PHF | | 0.93 | | | | | 0.93 | | | | | 0.88 | | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | 1 | | | | |
| Terrain | | Level | | | | | Level | | | | | Level | | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | 2.0% | | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.31 | | | | | 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 | | | | |
| $f_{HV}$ | | 0.990 | | | | | 0.990 | | | | | 0.990 | | | | |
| $f_P$ | | 1.00 | | | | | 1.00 | | | | | 1.00 | | | | |
| Off Flow (pcph) | | 1,043 | | | | | 1,195 | | | | | 769 | | | | |
| Off Flow (pcphpl) | | 1,043 | | | | | 597 | | | | | 769 | | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | Right | | | | |
| Off Ramp Speed | | 25 | | | | | 40 | | | | | 40 | | | | |
| Off Ramp Cap (pcph | | 1,900 | | | | | 4,000 | | | | | 2,000 | | | | |
| Off Ramp v/c ratio | | 0.55 | | | | | 0.30 | | | | | 0.38 | | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-La** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | | | | | |
| Up Distance | | | | | | | | | | | | | | | | |
| Up Flow (pcph) | | | | | | | | | | | | | | | | |
| Down Type | | | | | | | | | | | | | | | | |
| Down Distance | | | | | | | | | | | | | | | | |
| Down Flow (pcph) | | | | | | | | | | | | | | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_F$ (pcph) | | | | 2,839 | | | | | 3,114 | | | | | 3,299 | 3,402 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.610 | | | | | 0.586 | | | | | 0.586 | 0.615 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | 1.000 | | | | | 1.000 | | | | | 1.000 | 1.000 | |
| $v_{12}$ (pcph) | | | | 2,839 | | | | | 3,114 | | | | | 3,299 | 3,402 | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 2,839 | | | | | 3,114 | | | | | 3,299 | 3,402 | |
| $v_{R12a}$ (pcph) | | | | 4,588 | | | | | 3,298 | | | | | 3,368 | 4,171 | |
| Merge Speed Index | | | | 0.62 | | | | | 0.41 | | | | | 0.42 | 0.48 | |
| Merge Area Speed | | | | 50.7 | | | | | 55.5 | | | | | 55.4 | 54.0 | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | | | 50.7 | | | | | 55.5 | | | | | 55.4 | 54.0 | |
| Merge v/c ratio | | | | 1.00 | | | | | 0.72 | | | | | 0.73 | 0.91 | |
| Merge Density | | | | 33.2 | | | | | 29.2 | | | | | 29.8 | 29.3 | |
| Merge LOS | | | | D | | | | | D | | | | | D | D | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
> Express Lane (HO'
No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 3,886 | | | | | 4,226 | | | | | 4,140 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.615 | | | | | 0.599 | | | | | 0.621 | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | 1.000 | | | | |
| $v_{12}$ (pcph) | | 3,886 | | | | | 4,226 | | | | | 4,140 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 3,886 | | | | | 4,226 | | | | | 4,140 | | | | |
| Diverge Speed Index | | 0.65 | | | | | 0.47 | | | | | 0.43 | | | | |
| Diverge Area Speed | | 50.0 | | | | | 54.2 | | | | | 55.1 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | 50.0 | | | | | 54.2 | | | | | 55.1 | | | | |
| Diverge v/c ratio | | 0.88 | | | | | 0.96 | | | | | 0.94 | | | | |
| Diverge Density | | 36.4 | | | | | 29.2 | | | | | 38.6 | | | | |
| Diverge LOS | | E | | | | | D | | | | | E | | | | |



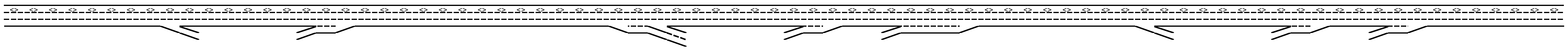
**Key**

> Express Lane (HO'

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.86 | 0.88 | 0.61 | 1.00 | 0.89 | 0.89 | 0.96 | 0.66 | 0.72 | 0.60 | 0.91 | 0.94 | 0.71 | 0.73 | 0.91 | 0.71 |
| Segment Density | 33.6 | 36.4 | 22.0 | 33.2 | 35.8 | 35.8 | 29.2 | 23.8 | 29.2 | 21.8 | 37.2 | 38.6 | 26.1 | 29.8 | 29.3 | 26.2 |
| Segment LOS | D | E | C | D | E | E | D | C | D | C | E | E | D | D | D | D |
| Over Capacity | | | | | | | | | | | | | | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

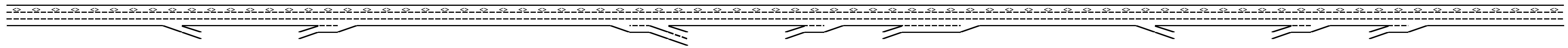
<> Express Lane (HOV)

No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Basic | Basic | Diverge | Basic | Merge | Merge | Basic |
| Length (ft) | 7,500 | 1,500 | 3,500 | 1,500 | 4,200 | 2,800 | 1,500 | 2,150 | 1,280 | 1,900 | 4,890 | 1,500 | 1,900 | 1,600 | 1,500 | 8,040 |
| Accel Length | | | | 1,155 | | | | | 300 | | | | | 300 | 1,330 | |
| Decel Length | | 140 | | | | | 1,270 | | | | | 140 | | | | |
| Mainline Volume | 2,310 | 2,310 | 1,750 | 1,750 | 3,290 | 3,290 | 3,290 | 2,220 | 2,220 | 2,420 | 3,150 | 3,150 | 2,770 | 2,770 | 2,810 | 3,540 |
| On Ramp Volume | | | | 1,540 | | | | | 200 | 730 | | | | 40 | 730 | |
| Off Ramp Volume | | 560 | | | | | 1,070 | | | | | 380 | | | | |
| Express Lane Volume | 242 | 181 | 135 | 135 | 320 | 320 | 298 | 298 | 298 | 309 | 684 | 347 | 348 | 348 | 351 | 718 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| | 0.1 | 0.08 | 0.08 | 0.08 | 0.1 | 0.1 | 0.09 | 0.13 | 0.13 | 0.13 | 0.22 | 0.11 | 0.13 | 0.13 | 0.12 | 0.2 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 2,068 | 2,129 | 1,615 | 3,155 | 2,970 | 2,970 | 2,992 | 1,922 | 2,122 | 2,841 | 2,466 | 2,803 | 2,422 | 2,462 | 3,189 | 2,822 |
| PHF | 0.84 | 0.86 | 0.88 | 0.89 | 0.91 | 0.91 | 0.92 | 0.92 | 0.94 | 0.96 | 0.98 | 0.96 | 0.93 | 0.93 | 0.92 | 0.92 |
| GP Lanes | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Grade | Grade | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 1.70 | 0.28 | 0.38 | 0.28 | 0.80 | 1.19 | 0.28 | 0.41 | 0.24 | 0.28 | 1.00 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 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 | 1.5 | 1.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 2,535 | 2,549 | 1,890 | 3,651 | 3,361 | 3,361 | 3,349 | 2,152 | 2,325 | 3,048 | 2,592 | 3,008 | 2,683 | 2,727 | 3,570 | 3,159 |
| GP Flow (pcphpl) | 1,268 | 1,275 | 945 | 1,826 | 1,681 | 1,681 | 1,675 | 1,076 | 1,163 | 1,016 | 1,296 | 1,504 | 1,341 | 1,363 | 1,785 | 1,579 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | | | | | | | | | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | | | | | | | | | |
| TRD | 1.5 | 1.5 | | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | | | | |
| $f_{LW}$ | 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 | | | | | | | | | |
| Calculated FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | | | | | | | | | |
| Measured FFS | 70.0 | 70.0 | | 70.0 | 70.0 | 70.0 | 70.0 | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.54 | 0.54 | 0.40 | 0.78 | 0.72 | 0.72 | 0.71 | 0.46 | 0.49 | 0.43 | 0.55 | 0.64 | 0.57 | 0.58 | 0.76 | 0.67 |
| Speed (mph) | 65.0 | 65.0 | 65.0 | 62.4 | 63.9 | 63.9 | 63.9 | 65.0 | 65.0 | 65.0 | 65.0 | 64.8 | 65.0 | 65.0 | 62.9 | 64.5 |
| Density (pcphpl) | 19.5 | 19.6 | 14.5 | 29.2 | 26.3 | 26.3 | 26.2 | 16.6 | 17.9 | 15.6 | 19.9 | 23.2 | 20.6 | 21.0 | 28.4 | 24.5 |
| LOS | C | C | B | D | D | D | D | B | B | B | C | C | C | C | D | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | | 2,549 | | 2,064 | | | 3,349 | | 2,115 | 2,280 | | 3,008 | | 2,685 | 2,802 | |
| $GP_{IN}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{IN}$ v/c ratio | | 0.54 | | 0.44 | | | 0.71 | | 0.45 | 0.49 | | 0.64 | | 0.57 | 0.60 | |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | | 1,972 | | 3,651 | | | 2,224 | | 2,325 | 3,048 | | 2,608 | | 2,727 | 3,570 | |
| $GP_{OUT}$ Cap (pcph) | | 4,700 | | 4,700 | | | 4,700 | | 4,700 | 4,700 | | 4,700 | | 4,700 | 4,700 | |
| $GP_{OUT}$ v/c ratio | | 0.42 | | 0.78 | | | 0.47 | | 0.49 | 0.65 | | 0.55 | | 0.58 | 0.76 | |

Project: Russell Ranch
Freeway Corridor: Westbound US 50

Alternative: Existing Plus Project Conditions
Time Period: PM Peak Hour

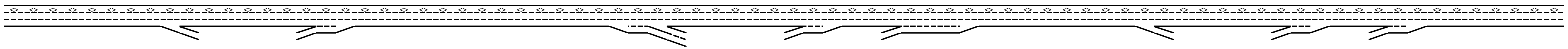


Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps |
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | |
| EL Volume (vph) | 242 | 181 | 135 | 135 | 320 | 320 | 298 | 298 |
| PHF | 0.84 | 0.86 | 0.88 | 0.89 | 0.91 | 0.91 | 0.92 | 0.92 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Grade | Level | Level | Grade | Grade | Grade | Grade |
| Grade % | -4.4% | -3.8% | 1.5% | 0.0% | 2.2% | -6.0% | -6.5% | -2.1% |
| Grade Length (mi) | 1.7 | 0.28 | 0.38 | 0.28 | 0.8 | 1.19 | 0.28 | 0.41 |
| Truck & Bus % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| RV % | 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 | 2.0 | 1.5 | 1.5 | 1.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $f_p$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EL Flow (pcph) | 289 | 211 | 153 | 152 | 352 | 352 | 324 | 324 |
| EL Flow (pcphpl) | 289 | 211 | 153 | 152 | 352 | 352 | 324 | 324 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | |
| Lane Width (ft) | 12 | 12 | | 12 | 12 | 12 | 12 | |
| Shoulder Width | >6 | >6 | | >6 | >6 | >6 | >6 | |
| TRD | 1.5 | 1.5 | 0.0 | 1.5 | 1.5 | 1.5 | 1.5 | 0.0 |
| $f_{LW}$ | 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 | |
| Calc'd FFS | 70.9 | 70.9 | | 70.9 | 70.9 | 70.9 | 70.9 | |
| Measured FFS | | | | | | | | |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | |
| $EL_{in}$ v/c ratio | 0.16 | 0.12 | 0.09 | 0.09 | 0.20 | 0.20 | 0.19 | 0.19 |
| **Calculate On Ramp Flow Rate** | | | | | | | | |
| On Volume (vph) | | | | 1,540 | | | | |
| PHF | | | | 0.98 | | | | |
| Total Lanes | | | | 1 | | | | |
| Terrain | | | | Level | | | | |
| Grade % | | | | 2.0% | | | | |
| 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 Flow (pcph) | | | | 1,587 | | | | |
| On Flow (pcphpl) | | | | 1,587 | | | | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | |
| On Ramp Type | | | | Right | | | | |
| On Ramp Speed (mph) | | | | 35 | | | | |
| On Ramp Cap (pcph) | | | | 2,000 | | | | |
| On Ramp v/c ratio | | | | 0.79 | | | | |

| Location | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Name | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | |
| EL Volume (vph) | 298 | 309 | 684 | 347 | 348 | 348 | 351 | 718 |
| PHF | 0.94 | 0.96 | 0.98 | 0.96 | 0.93 | 0.93 | 0.92 | 0.92 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -2.8% | -1.8% | -1.2% | -1.8% | -1.2% | 1.8% | 1.8% | 1.8% |
| Grade Length (mi) | 0.24 | 0.28 | 1 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Truck & Bus % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| RV % | 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 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $f_p$ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EL Flow (pcph) | 317 | 322 | 698 | 361 | 374 | 374 | 382 | 781 |
| EL Flow (pcphpl) | 317 | 322 | 698 | 361 | 374 | 374 | 382 | 781 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | |
| Lane Width (ft) | | | | | | | | |
| Shoulder Width | | | | | | | | |
| TRD | 0.0 | 0.0 | | | | | | |
| $f_{LW}$ | | | | | | | | |
| $f_{LC}$ | | | | | | | | |
| Calc'd FFS | | | | | | | | |
| Measured FFS | | 65.0 | 65.0 | | | | | |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | |
| $EL_{in}$ v/c ratio | 0.18 | 0.18 | 0.40 | 0.21 | 0.21 | 0.21 | 0.22 | 0.45 |
| **Calculate On Ramp Flow Rate** | | | | | | | | |
| On Volume (vph) | 200 | 730 | | | | 40 | 730 | |
| PHF | 0.96 | 0.96 | | | | 0.96 | 0.96 | |
| Total Lanes | 1 | 1 | | | | 1 | 1 | |
| Terrain | Level | Level | | | | Level | Level | |
| Grade % | 2.0% | 2.0% | | | | 2.0% | 2.0% | |
| Grade Length (mi) | 0.33 | 0.47 | | | | 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 | |
| On Flow (pcph) | 210 | 768 | | | | 42 | 768 | |
| On Flow (pcphpl) | 210 | 768 | | | | 42 | 768 | |
| **Calculate On Ramp Roadway Operations** | | | | | | | | |
| On Ramp Type | Right | Right | | | | Right | Right | |
| On Ramp Speed (mph) | 25 | 45 | | | | 25 | 35 | |
| On Ramp Cap (pcph) | 1,900 | 2,100 | | | | 1,900 | 2,000 | |
| On Ramp v/c ratio | 0.11 | 0.37 | | | | 0.02 | 0.38 | |

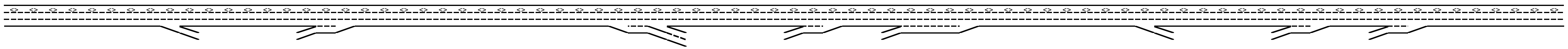
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | | 560 | | | | | 1,070 | | | | | 380 | | | | |
| PHF | | 0.98 | | | | | 0.96 | | | | | 0.96 | | | | |
| Total Lanes | | 1 | | | | | 2 | | | | | 1 | | | | |
| Terrain | | Level | | | | | Level | | | | | Level | | | | |
| Grade % | | 2.0% | | | | | 2.0% | | | | | 2.0% | | | | |
| Grade Length (mi) | | 0.00 | | | | | 0.31 | | | | | 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 | | | | |
| $f_{HV}$ | | 0.990 | | | | | 0.990 | | | | | 0.990 | | | | |
| $f_P$ | | 1.00 | | | | | 1.00 | | | | | 1.00 | | | | |
| Off Flow (pcph) | | 577 | | | | | 1,126 | | | | | 400 | | | | |
| Off Flow (pcphpl) | | 577 | | | | | 563 | | | | | 400 | | | | |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | | Right | | | | | Right | | | | | Right | | | | |
| Off Ramp Speed | | 25 | | | | | 40 | | | | | 40 | | | | |
| Off Ramp Cap (pcph) | | 1,900 | | | | | 4,000 | | | | | 2,000 | | | | |
| Off Ramp v/c ratio | | 0.30 | | | | | 0.28 | | | | | 0.20 | | | | |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | | | | | |
| Up Distance | | | | | | | | | | | | | | | | |
| Up Flow (pcph) | | | | | | | | | | | | | | | | |
| Down Type | | | | | | | | | | | | | | | | |
| Down Distance | | | | | | | | | | | | | | | | |
| Down Flow (pcph) | | | | | | | | | | | | | | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | 2,064 | | | | | 2,115 | | | | | 2,685 | 2,802 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | 0.610 | | | | | 0.586 | | | | | 0.586 | 0.615 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | 1.000 | | | | | 1.000 | | | | | 1.000 | 1.000 | |
| $v_{12}$ (pcph) | | | | 2,064 | | | | | 2,115 | | | | | 2,685 | 2,802 | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | 2,064 | | | | | 2,115 | | | | | 2,685 | 2,802 | |
| $v_{R12a}$ (pcph) | | | | 3,651 | | | | | 2,325 | | | | | 2,727 | 3,570 | |
| Merge Speed Index | | | | 0.39 | | | | | 0.35 | | | | | 0.37 | 0.37 | |
| Merge Area Speed | | | | 56.0 | | | | | 57.0 | | | | | 56.6 | 56.6 | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | | | 56.0 | | | | | 57.0 | | | | | 56.6 | 56.6 | |
| Merge v/c ratio | | | | 0.79 | | | | | 0.51 | | | | | 0.59 | 0.78 | |
| Merge Density | | | | 26.0 | | | | | 21.6 | | | | | 24.8 | 24.6 | |
| Merge LOS | | | | C | | | | | C | | | | | C | C | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

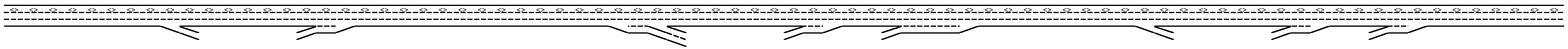


**Key**

<> Express Lane (HOV)

No Trucks

| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | 2,549 | | | | | 3,349 | | | | | 3,008 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | 0.670 | | | | | 0.624 | | | | | 0.666 | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | 1.000 | | | | | 1.000 | | | | | 1.000 | | | | |
| $v_{12}$ (pcph) | | 2,549 | | | | | 3,349 | | | | | 3,008 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | 2,549 | | | | | 3,349 | | | | | 3,008 | | | | |
| Diverge Speed Index | | 0.61 | | | | | 0.46 | | | | | 0.40 | | | | |
| Diverge Area Speed | | 51.0 | | | | | 54.3 | | | | | 55.8 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | | |
| Segment Speed | | 51.0 | | | | | 54.3 | | | | | 55.8 | | | | |
| Diverge v/c ratio | | 0.58 | | | | | 0.76 | | | | | 0.68 | | | | |
| Diverge Density | | 24.9 | | | | | 21.6 | | | | | 28.9 | | | | |
| Diverge LOS | | C | | | | | C | | | | | D | | | | |



**Key**

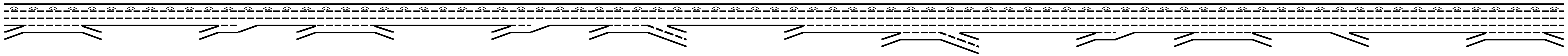
<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Name | East of El Dorado Hills Blvd | El Dorado Hills Blvd Off-Ramp | Between Ramps | El Dorado Hills Blvd On-Ramp | El Dorado Hills Blvd to E. Bidwell I | El Dorado Hills Blvd to E. Bidwell II | E. Bidwell St Off-Ramp | Between E. Bidwell St Ramps |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.54 | 0.58 | 0.40 | 0.79 | 0.72 | 0.72 | 0.76 | 0.46 |
| Segment Density | 19.5 | 24.9 | 14.5 | 26.0 | 26.3 | 26.3 | 21.6 | 16.6 |
| Segment LOS | C | C | B | C | D | D | C | B |
| Over Capacity | | | | | | | | |

| Location | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Name | E. Bidwell St Loop On-Ramp | E. Bidwell St On-Ramp | US 50 west of E. Bidwell St | Prairie City Off-Ramp | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip On Ramp | West of Prairie City Ramps |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.51 | 0.43 | 0.55 | 0.68 | 0.57 | 0.59 | 0.78 | 0.67 |
| Segment Density | 21.6 | 15.6 | 19.9 | 28.9 | 20.6 | 24.8 | 24.6 | 24.5 |
| Segment LOS | C | B | C | D | C | C | C | C |
| Over Capacity | | | | | | | | |

# Cumulative No Project Conditions



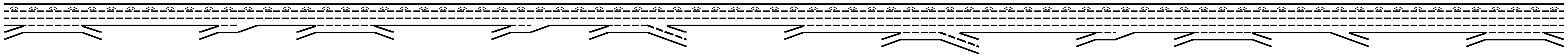
**Key**
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Basic | Weave | Basic | Merge | Weave | Diverge | Basic | Weave |
| Length (ft) | 11,700 | 1,700 | 1,000 | 1,200 | 1,650 | 780 | 5,000 | 1,850 | 1,360 | 3,500 | 1,850 | 1,360 | 4,200 | 330 | 1,500 | 3,150 |
| Accel Length | | | 300 | | | 300 | | | | | | 300 | | | | |
| Decel Length | | | | | | | | | | | | | | 150 | | |
| Mainline Volume | 5,074 | 5,090 | 5,090 | 5,140 | 4,520 | 4,520 | 4,660 | 3,460 | 3,460 | 3,580 | 3,260 | 3,260 | 3,640 | 3,240 | 3,010 | 3,010 |
| On Ramp Volume | 306 | | 50 | 290 | | 140 | 140 | | 120 | 470 | | 380 | 190 | | | 470 |
| Off Ramp Volume | 290 | | | 910 | | | 1,340 | | | 790 | | | 590 | 230 | | 319 |
| Express Lane Volume | 660 | 662 | 662 | 668 | 588 | 588 | 606 | 450 | 450 | 465 | 424 | 424 | 473 | 421 | 391 | 391 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 4,720 | 4,428 | 4,478 | 4,762 | 3,932 | 4,072 | 4,194 | 3,010 | 3,130 | 3,585 | 2,836 | 3,216 | 3,357 | 2,819 | 2,619 | 3,089 |
| PHF | 0.92 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| GP Lanes | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 4 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 6.4% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 |
| $E_R$ | 1.2 | 1.2 | 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 | 3.0 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 5,285 | 4,751 | 4,805 | 5,005 | 4,133 | 4,280 | 4,408 | 3,230 | 3,358 | 4,406 | 3,175 | 3,601 | 3,758 | 3,156 | 2,932 | 3,559 |
| GP Flow (pcphpl) | 1,762 | 2,376 | 2,402 | 1,668 | 2,067 | 2,140 | 1,469 | 1,615 | 1,119 | 1,102 | 1,058 | 1,200 | 940 | 1,052 | 977 | 890 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | | | | | |
| Shoulder Width | | | | | | | | | | | | | | | | |
| TRD | | | | | | | | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | | | | | | | | |
| Calculated FFS | | | | | | | | | | | | | | | | |
| Measured FFS | | | | | | | | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.75 | 1.01 | 1.02 | 0.71 | 0.88 | 0.91 | 0.63 | 0.69 | 0.48 | 0.47 | 0.45 | 0.51 | 0.40 | 0.45 | 0.42 | 0.38 |
| Speed (mph) | 63.1 | - | - | 64.0 | 58.7 | 57.2 | 64.9 | 64.3 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 |
| Density (pcphpl) | 27.9 | - | - | 26.1 | 35.2 | 37.4 | 22.6 | 25.1 | 17.2 | 16.9 | 16.3 | 18.5 | 14.5 | 16.2 | 15.0 | 13.7 |
| LOS | D | F | F | D | E | E | C | C | B | B | B | C | B | B | B | B |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 4,949 | | 4,750 | 4,700 | | 4,126 | 4,254 | | 3,227 | 3,890 | | 3,184 | 3,550 | 3,156 | | 3,048 |
| $GP_{IN}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | 4,700 | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{IN}$ v/c ratio | 1.05 | | 1.01 | 1.00 | | 0.88 | 0.91 | | 0.69 | 0.55 | | 0.45 | 0.50 | 0.45 | | 0.43 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 4,966 | | 4,805 | 4,006 | | 4,280 | 2,937 | | | 3,539 | | 3,601 | 3,137 | 2,914 | | 3,209 |
| $GP_{OUT}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{OUT}$ v/c ratio | 1.06 | | 1.02 | 0.85 | | 0.91 | 0.62 | | | 0.50 | | 0.51 | 0.45 | 0.41 | | 0.46 |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

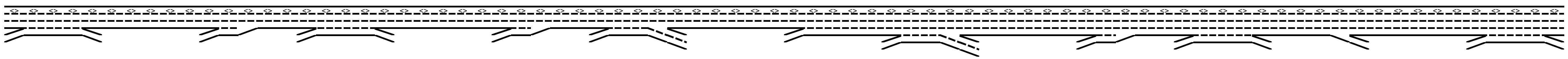
Alternative: Cumulative No Project Conditions
Time Period: AM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 660 | 662 | 662 | 668 | 588 | 588 | 606 | 450 | 450 | 465 | 424 | 424 | 473 | 421 | 391 | 391 |
| PHF | 0.92 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 6.4% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| 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% | 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 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 | 2.5 |
| $E_R$ | 1.2 | 1.2 | 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 | 3.0 |
| $f_{HV}$ | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.926 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 724 | 696 | 696 | 689 | 606 | 606 | 624 | 473 | 473 | 524 | 465 | 465 | 519 | 462 | 430 | 438 |
| EL Flow (pcphpl) | 724 | 696 | 696 | 689 | 606 | 606 | 624 | 473 | 473 | 524 | 465 | 465 | 519 | 462 | 430 | 438 |
| ***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 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.41 | 0.40 | 0.40 | 0.39 | 0.35 | 0.35 | 0.36 | 0.27 | 0.27 | 0.30 | 0.27 | 0.27 | 0.30 | 0.26 | 0.25 | 0.25 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | 306 | | 50 | 290 | | 140 | 140 | | 120 | 470 | | 380 | 190 | | | 470 |
| PHF | 0.92 | | 0.92 | 0.96 | | 0.92 | 0.92 | | 0.92 | 0.92 | | 0.92 | 0.92 | | | 0.93 |
| Total Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | | 1 |
| Terrain | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level | | | Level |
| Grade % | 0.0% | | 2.0% | 2.0% | | 0.0% | 0.0% | | 2.0% | 2.0% | | 0.0% | 0.0% | | | 2.0% |
| 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 |
| $f_{HV}$ | 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 |
| On Flow (pcph) | 336 | | 55 | 305 | | 154 | 154 | | 132 | 516 | | 417 | 209 | | | 510 |
| On Flow (pcphpl) | 336 | | 55 | 305 | | 154 | 154 | | 132 | 516 | | 417 | 209 | | | 510 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right | | | Right |
| On Ramp Speed (mph) | 35 | | 35 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | | 35 |
| On Ramp Cap (pcph) | 2,000 | | 2,000 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | | 2,000 |
| On Ramp v/c ratio | 0.17 | | 0.03 | 0.15 | | 0.08 | 0.07 | | 0.07 | 0.25 | | 0.22 | 0.10 | | | 0.26 |



**Key**

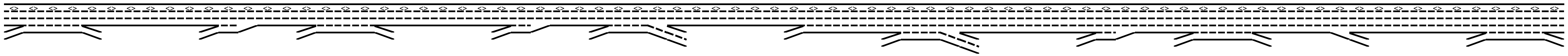
<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | 290 | | | 910 | | | 1,340 | | | 790 | | | 590 | 230 | | 319 |
| PHF | 0.92 | | | 0.92 | | | 0.92 | | | 0.92 | | | 0.96 | 0.96 | | 0.92 |
| Total Lanes | 1 | | | 1 | | | 2 | | | 2 | | | 1 | 1 | | 1 |
| Terrain | Level | | | Level | | | Level | | | Level | | | Level | Level | | Level |
| Grade % | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | 2.0% | | 2.0% |
| Grade Length (mi) | 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% |
| RV % | 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 |
| $E_R$ | 1.2 | | | 1.2 | | | 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 |
| $f_P$ | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | 1.00 | | 1.00 |
| Off Flow (pcph) | 318 | | | 999 | | | 1,471 | | | 867 | | | 621 | 242 | | 350 |
| Off Flow (pcphpl) | 318 | | | 999 | | | 736 | | | 434 | | | 621 | 242 | | 350 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | | Right | | | Right | | | Right | | | Right | Right | | Right |
| Off Ramp Speed | 35 | | | 40 | | | 40 | | | 40 | | | 35 | 25 | | 40 |
| Off Ramp Cap (pcph) | 2,000 | | | 2,000 | | | 4,000 | | | 4,000 | | | 2,000 | 1,900 | | 2,000 |
| Off Ramp v/c ratio | 0.16 | | | 0.50 | | | 0.37 | | | 0.22 | | | 0.31 | 0.13 | | 0.18 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | No | | Off | | |
| Up Distance | | | | | | | | | | | | | | #### | | |
| Up Flow (pcph) | | | | | | | | | | | | | | 621 | | |
| Down Type | | | | | | | | | | | | On | | On | | |
| Down Distance | | | | | | | | | | | | 1,360 | | 1,500 | | |
| Down Flow (pcph) | | | | | | | | | | | | 209 | | 510 | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | 4,750 | | | 4,126 | | | | | | 3,184 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | 1,472 | | | | |
| $P_{FM}$ (Eqn 13-3) | | | 0.586 | | | 0.586 | | | | | | 0.586 | | | | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | 1.000 | | | 1.000 | | | | | | 0.586 | | | | |
| $v_{12}$ (pcph) | | | 4,750 | | | 4,126 | | | | | | 1,865 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | 1,318 | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | 4,750 | | | 4,126 | | | | | | 1,865 | | | | |
| $v_{R12a}$ (pcph) | | | 4,805 | | | 4,280 | | | | | | 2,282 | | | | |
| Merge Speed Index | | | - | | | 0.59 | | | | | | 0.34 | | | | |
| Merge Area Speed | | | - | | | 51.5 | | | | | | 57.1 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | 1,318 | | | | |
| Outer Lanes Speed | | | | | | | | | | | | 62.1 | | | | |
| Segment Speed | | | | | | 51.5 | | | | | | 58.8 | | | | |
| Merge v/c ratio | | | 1.04 | | | 0.93 | | | | | | 0.50 | | | | |
| Merge Density | | | - | | | 36.9 | | | | | | 21.2 | | | | |
| Merge LOS | | | F | | | E | | | | | | C | | | | |

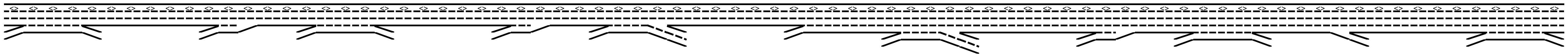
Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Cumulative No Project Conditions
Time Period: AM Peak Hour



Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | 3,156 | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | 4,958 | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | 532 | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | 0.670 | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | 0.670 | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | 2,194 | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | 962 | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | 2,194 | | |
| Diverge Speed Index | | | | | | | | | | | | | | 0.58 | | |
| Diverge Area Speed | | | | | | | | | | | | | | 51.7 | | |
| Outer Lanes Volume | | | | | | | | | | | | | | 962 | | |
| Outer Lanes Speed | | | | | | | | | | | | | | 71.3 | | |
| Segment Speed | | | | | | | | | | | | | | 56.4 | | |
| Diverge v/c ratio | | | | | | | | | | | | | | 0.50 | | |
| Diverge Density | | | | | | | | | | | | | | 21.8 | | |
| Diverge LOS | | | | | | | | | | | | | | C | | |



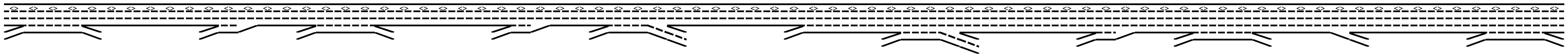
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.75 | 1.01 | 1.04 | #VALUE! | 0.88 | 0.93 | 0.63 | 0.69 | 0.48 | #VALUE! | 0.45 | 0.50 | 0.40 | 0.50 | 0.42 | 0.38 |
| Segment Density | 27.9 | - | - | #VALUE! | 35.2 | 36.9 | 22.6 | 25.1 | 17.2 | #VALUE! | 16.3 | 21.2 | 14.5 | 21.8 | 15.0 | 13.7 |
| Segment LOS | D | F | F | #VALUE! | E | E | C | C | B | #VALUE! | B | C | B | C | B | B |
| Over Capacity | | Segment GP Lanes | Segment GP Lanes In GP Lanes Out GP Lanes Merge | #VALUE! | | | | | | #VALUE! | | | | | | |

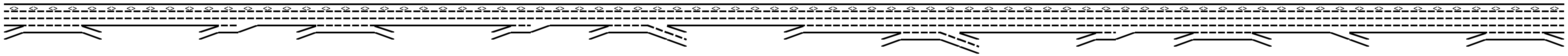
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Basic | Weave | Basic | Merge | Weave | Diverge | Basic | Weave |
| Length (ft) | 11,700 | 1,700 | 1,000 | 1,200 | 1,650 | 780 | 5,000 | 1,850 | 1,360 | 3,500 | 1,850 | 1,360 | 4,200 | 330 | 1,500 | 3,150 |
| Accel Length | | | 300 | | | 300 | | | | | | 300 | | | | |
| Decel Length | | | | | | | | | | | | | | 150 | | |
| Mainline Volume | 6,344 | 5,690 | 5,690 | 5,810 | 5,160 | 5,160 | 5,310 | 4,150 | 4,150 | 4,990 | 4,800 | 4,800 | 5,340 | 4,990 | 4,410 | 4,410 |
| On Ramp Volume | 306 | | 120 | 630 | | 150 | 350 | | 840 | 890 | | 540 | 210 | | | 860 |
| Off Ramp Volume | 960 | | | 1,280 | | | 1,510 | | | 1,080 | | | 560 | 580 | | 800 |
| Express Lane Volume | 1,269 | 1,138 | 1,138 | 1,162 | 1,032 | 1,032 | 1,062 | 830 | 830 | 998 | 960 | 960 | 1,068 | 998 | 882 | 882 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| | 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 | 0.2 | 0.2 | 0.2 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 5,381 | 4,552 | 4,672 | 5,278 | 4,128 | 4,278 | 4,598 | 3,320 | 4,160 | 4,882 | 3,840 | 4,380 | 4,482 | 3,992 | 3,528 | 4,388 |
| PHF | 0.99 | 0.99 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| GP Lanes | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 4 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 6.4% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 |
| $E_R$ | 1.2 | 1.2 | 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 | 3.0 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 5,599 | 4,736 | 5,013 | 5,663 | 4,429 | 4,590 | 4,933 | 3,489 | 4,372 | 5,878 | 4,036 | 4,603 | 4,711 | 4,196 | 3,708 | 4,746 |
| GP Flow (pcphpl) | 1,866 | 2,368 | 2,506 | 1,888 | 2,215 | 2,295 | 1,644 | 1,745 | 1,457 | 1,470 | 1,345 | 1,534 | 1,178 | 1,399 | 1,236 | 1,187 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | | | | | |
| Shoulder Width | | | | | | | | | | | | | | | | |
| TRD | | | | | | | | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | | | | | | | | |
| Calculated FFS | | | | | | | | | | | | | | | | |
| Measured FFS | | | | | | | | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.79 | 1.01 | 1.07 | 0.80 | 0.94 | 0.98 | 0.70 | 0.74 | 0.62 | 0.63 | 0.57 | 0.65 | 0.50 | 0.60 | 0.53 | 0.50 |
| Speed (mph) | 61.9 | - | - | 61.6 | 55.6 | 53.6 | 64.2 | 63.3 | 65.0 | 64.9 | 65.0 | 64.7 | 65.0 | 65.0 | 65.0 | 65.0 |
| Density (pcphpl) | 30.1 | - | - | 30.6 | 39.8 | 42.8 | 25.6 | 27.6 | 22.4 | 22.6 | 20.7 | 23.7 | 18.1 | 21.5 | 19.0 | 18.3 |
| LOS | D | F | F | D | E | E | C | D | C | C | C | C | C | C | C | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 5,277 | | 4,881 | 4,971 | | 4,425 | 4,549 | | 3,515 | 4,970 | | 4,011 | 4,480 | 4,196 | | 3,860 |
| $GP_{IN}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | 4,700 | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{IN}$ v/c ratio | 1.12 | | 1.04 | 1.06 | | 0.94 | 0.97 | | 0.75 | 0.71 | | 0.57 | 0.64 | 0.60 | | 0.55 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 4,589 | | 5,013 | 4,316 | | 4,590 | 3,393 | | | 4,693 | | 4,603 | 4,134 | 3,598 | | 3,868 |
| $GP_{OUT}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{OUT}$ v/c ratio | 0.98 | | 1.07 | 0.92 | | 0.98 | 0.72 | | | 0.67 | | 0.65 | 0.59 | 0.51 | | 0.55 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



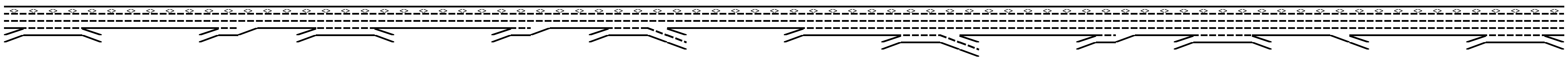
**Key**

<> Express Lane (HOV)

No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 1,269 | 1,138 | 1,138 | 1,162 | 1,032 | 1,032 | 1,062 | 830 | 830 | 998 | 960 | 960 | 1,068 | 998 | 882 | 882 |
| PHF | 0.96 | 0.96 | 0.96 | 0.98 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 6.4% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| 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% | 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 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 | 2.5 |
| $E_R$ | 1.2 | 1.2 | 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 | 3.0 |
| $f_{HV}$ | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.926 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 1,335 | 1,197 | 1,197 | 1,198 | 1,086 | 1,086 | 1,117 | 855 | 855 | 1,100 | 989 | 989 | 1,101 | 1,029 | 909 | 927 |
| EL Flow (pcphpl) | 1,335 | 1,197 | 1,197 | 1,198 | 1,086 | 1,086 | 1,117 | 855 | 855 | 1,100 | 989 | 989 | 1,101 | 1,029 | 909 | 927 |
| ***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 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.76 | 0.68 | 0.68 | 0.68 | 0.62 | 0.62 | 0.64 | 0.49 | 0.49 | 0.63 | 0.57 | 0.57 | 0.63 | 0.59 | 0.52 | 0.53 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | 306 | | 120 | 630 | | 150 | 350 | | 840 | 890 | | 540 | 210 | | | 860 |
| PHF | 0.96 | | 0.92 | 0.92 | | 0.92 | 0.92 | | 0.99 | 0.99 | | 0.92 | 0.92 | | | 0.98 |
| Total Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | | 1 |
| Terrain | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level | | | Level |
| Grade % | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | | 2.0% |
| 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 |
| $f_{HV}$ | 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 |
| On Flow (pcph) | 322 | | 132 | 692 | | 165 | 384 | | 857 | 908 | | 593 | 231 | | | 886 |
| On Flow (pcphpl) | 322 | | 132 | 692 | | 165 | 384 | | 857 | 908 | | 593 | 231 | | | 886 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right | | | Right |
| On Ramp Speed (mph) | 45 | | 35 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | | 35 |
| On Ramp Cap (pcph) | 2,100 | | 2,000 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | | 2,000 |
| On Ramp v/c ratio | 0.15 | | 0.07 | 0.33 | | 0.09 | 0.18 | | 0.45 | 0.43 | | 0.31 | 0.11 | | | 0.44 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



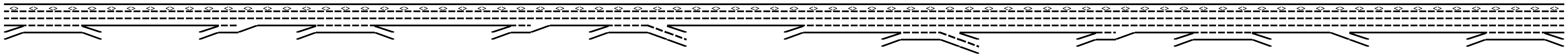
Key
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | 960 | | | 1,280 | | | 1,510 | | | 1,080 | | | 560 | 580 | | 800 |
| PHF | 0.96 | | | 0.96 | | | 0.99 | | | 0.92 | | | 0.98 | 0.98 | | 0.92 |
| Total Lanes | 1 | | | 1 | | | 2 | | | 2 | | | 1 | 1 | | 1 |
| Terrain | Level | | | Level | | | Level | | | Level | | | Level | Level | | Level |
| Grade % | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | 2.0% | | 2.0% |
| Grade Length (mi) | 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% |
| RV % | 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 |
| $E_R$ | 1.2 | | | 1.2 | | | 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 |
| $f_P$ | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 |
| Off Flow (pcph) | 1,010 | | | 1,347 | | | 1,541 | | | 1,186 | | | 577 | 598 | | 878 |
| Off Flow (pcphpl) | 1,010 | | | 1,347 | | | 770 | | | 593 | | | 577 | 598 | | 878 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | | Right | | | Right | | | Right | | | Right | Right | | Right |
| Off Ramp Speed | 35 | | | 40 | | | 40 | | | 40 | | | 35 | 25 | | 40 |
| Off Ramp Cap (pcph) | 2,000 | | | 2,000 | | | 4,000 | | | 4,000 | | | 2,000 | 1,900 | | 2,000 |
| Off Ramp v/c ratio | 0.51 | | | 0.67 | | | 0.39 | | | 0.30 | | | 0.29 | 0.31 | | 0.44 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | No | | Off | | |
| Up Distance | | | | | | | | | | | | | | #### | | |
| Up Flow (pcph) | | | | | | | | | | | | | | 577 | | |
| Down Type | | | | | | | | | | | | On | | On | | |
| Down Distance | | | | | | | | | | | | 1,360 | | 1,500 | | |
| Down Flow (pcph) | | | | | | | | | | | | 231 | | 886 | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | 4,881 | | | 4,425 | | | | | | 4,011 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | 1,627 | | | | |
| $P_{FM}$ (Eqn 13-3) | | | 0.586 | | | 0.586 | | | | | | 0.586 | | | | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | 1.000 | | | 1.000 | | | | | | 0.586 | | | | |
| $v_{12}$ (pcph) | | | 4,881 | | | 4,425 | | | | | | 2,350 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | 1,661 | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | 4,881 | | | 4,425 | | | | | | 2,350 | | | | |
| $v_{R12a}$ (pcph) | | | 5,013 | | | 4,590 | | | | | | 2,943 | | | | |
| Merge Speed Index | | | - | | | 0.69 | | | | | | 0.38 | | | | |
| Merge Area Speed | | | - | | | 49.1 | | | | | | 56.3 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | 1,661 | | | | |
| Outer Lanes Speed | | | | | | | | | | | | 60.8 | | | | |
| Segment Speed | | | | | | 49.1 | | | | | | 57.8 | | | | |
| Merge v/c ratio | | | 1.09 | | | 1.00 | | | | | | 0.64 | | | | |
| Merge Density | | | - | | | 39.3 | | | | | | 26.3 | | | | |
| Merge LOS | | | F | | | E | | | | | | C | | | | |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Cumulative No Project Conditions
Time Period: PM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

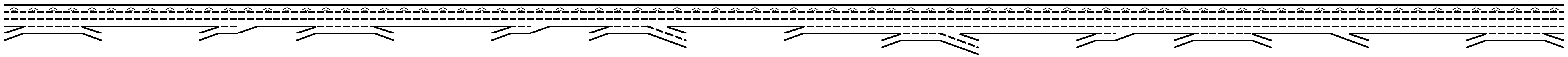
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | 4,196 | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | 4,728 | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | 1,115 | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | 0.628 | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | 0.628 | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | 2,856 | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | 1,340 | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | 2,856 | | |
| Diverge Speed Index | | | | | | | | | | | | | | 0.61 | | |
| Diverge Area Speed | | | | | | | | | | | | | | 50.9 | | |
| Outer Lanes Volume | | | | | | | | | | | | | | 1,340 | | |
| Outer Lanes Speed | | | | | | | | | | | | | | 70.0 | | |
| Segment Speed | | | | | | | | | | | | | | 55.8 | | |
| Diverge v/c ratio | | | | | | | | | | | | | | 0.65 | | |
| Diverge Density | | | | | | | | | | | | | | 27.5 | | |
| Diverge LOS | | | | | | | | | | | | | | C | | |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Cumulative No Project Conditions
Time Period: PM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|

| Location | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|



**Key**

<> Express Lane (HOV)

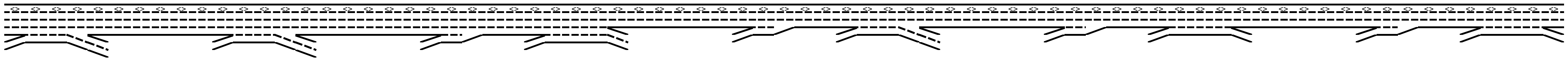
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps |
|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.79 | 1.01 | 1.09 | #VALUE! | 0.94 | 1.00 | #VALUE! | 0.74 |
| Segment Density | 30.1 | - | - | #VALUE! | 39.8 | 39.3 | #VALUE! | 27.6 |
| Segment LOS | D | F | F | #VALUE! | E | E | #VALUE! | D |
| Over Capacity | | Segment GP Lanes | Segment GP Lanes In GP Lanes Out GP Lanes Merge | #VALUE! | | | #VALUE! | |

| Name | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.62 | #VALUE! | 0.57 | 0.64 | 0.50 | 0.65 | 0.53 | #VALUE! |
| Segment Density | 22.4 | #VALUE! | 20.7 | 26.3 | 18.1 | 27.5 | 19.0 | #VALUE! |
| Segment LOS | C | #VALUE! | C | C | C | C | C | #VALUE! |
| Over Capacity | | #VALUE! | | | | | | #VALUE! |

Project: Russell Ranch
Freeway Corridor: Westbound US 50

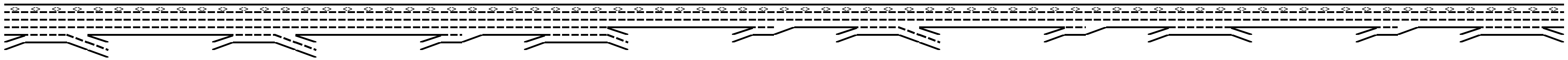
Alternative: Cumulative No Project Conditions
Time Period: AM Peak Hour



Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
| **Define Freeway Segment** | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave |
| Length (ft) | 3,500 | 2,500 | 4,000 | 1,650 | 780 | 3,500 | 1,650 | 780 | 5,000 | 1,650 | 780 | 2,000 | 1,400 | 1,250 | 10,500 |
| Accel Length | | | | | 300 | | | 300 | | | 300 | | | 300 | |
| Decel Length | | | | | | | | | | | | | | | |
| Mainline Volume | 4,584 | 4,500 | 4,500 | 3,940 | 3,940 | 4,330 | 3,640 | 3,640 | 3,860 | 4,120 | 4,120 | 4,450 | 4,870 | 4,870 | 5,030 |
| On Ramp Volume | 866 | | 930 | | 390 | 190 | | 220 | 890 | | 330 | 1,100 | | 160 | 310 |
| Off Ramp Volume | 950 | | 1,490 | | | 880 | | | 630 | | | 680 | | | 382 |
| Express Lane Volume | 917 | 900 | 900 | 788 | 788 | 866 | 728 | 728 | 772 | 824 | 824 | 890 | 974 | 974 | 1,006 |
| EL On Ramp Volume | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | |
| | 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 | 0.2 | 0.2 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | |
| GP Volume (vph) | 4,533 | 3,600 | 4,530 | 3,152 | 3,542 | 3,654 | 2,912 | 3,132 | 3,978 | 3,296 | 3,626 | 4,660 | 3,896 | 4,056 | 4,334 |
| PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.99 |
| GP Lanes | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |
| Terrain | Grade | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Grade | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -6.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 4.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.943 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 |
| GP Flow (pcph) | 5,075 | 4,030 | 5,072 | 3,632 | 3,966 | 4,091 | 3,124 | 3,360 | 4,268 | 3,536 | 3,890 | 5,000 | 4,095 | 4,263 | 4,509 |
| GP Flow (pcphpl) | 1,269 | 1,343 | 1,268 | 1,211 | 1,322 | 1,023 | 1,562 | 1,680 | 1,423 | 1,768 | 1,945 | 1,667 | 2,047 | 2,131 | 1,503 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calculated FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS Curve | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | |
| v/c ratio | 0.53 | 0.56 | 0.53 | 0.50 | 0.55 | 0.43 | 0.65 | 0.70 | 0.59 | 0.74 | 0.81 | 0.69 | 0.85 | 0.89 | 0.63 |
| Speed (mph) | 69.9 | 69.8 | 69.9 | 70.0 | 69.8 | 70.0 | 68.5 | 67.3 | 69.4 | 66.3 | 63.6 | 67.5 | 61.7 | 59.9 | 68.9 |
| Density (pcphpl) | 18.1 | 19.3 | 18.1 | 17.3 | 18.9 | 14.6 | 22.8 | 25.0 | 20.5 | 26.7 | 30.6 | 24.7 | 33.2 | 35.6 | 21.8 |
| LOS | C | C | C | B | C | B | C | C | C | D | D | C | D | E | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 4,164 | | 4,093 | | 3,537 | 3,882 | | 3,129 | 3,332 | | 3,528 | 3,792 | | 4,087 | 4,169 |
| $GP_{IN}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 7,200 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{IN}$ v/c ratio | 0.58 | | 0.57 | | 0.49 | 0.54 | | 0.65 | 0.69 | | 0.74 | 0.79 | | 0.85 | 0.87 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 4,076 | | 3,436 | | 3,966 | 3,165 | | 3,360 | 3,576 | | 3,890 | 4,253 | | 4,263 | 4,090 |
| $GP_{OUT}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{OUT}$ v/c ratio | 0.57 | | 0.48 | | 0.55 | 0.66 | | 0.70 | 0.75 | | 0.81 | 0.89 | | 0.89 | 0.85 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



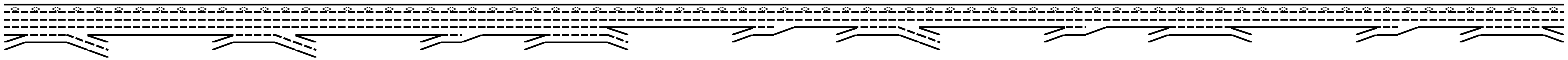
**Key**
<> Express Lane (HOV)
No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | |
| EL Volume (vph) | 917 | 900 | 900 | 788 | 788 | 866 | 728 | 728 | 772 | 824 | 824 | 890 | 974 | 974 | 1,006 |
| PHF | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -6.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| 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% | 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% | 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 | 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 | 1.2 |
| $f_{HV}$ | 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 | 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 | 1.00 |
| EL Flow (pcph) | 1,006 | 988 | 947 | 829 | 829 | 911 | 766 | 766 | 812 | 867 | 867 | 936 | 1,004 | 1,004 | 1,037 |
| EL Flow (pcphpl) | 1,006 | 988 | 947 | 829 | 829 | 911 | 766 | 766 | 812 | 867 | 867 | 936 | 1,004 | 1,004 | 1,037 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calc'd FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.58 | 0.56 | 0.54 | 0.47 | 0.47 | 0.52 | 0.44 | 0.44 | 0.46 | 0.50 | 0.50 | 0.54 | 0.57 | 0.57 | 0.59 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | |
| On Volume (vph) | 866 | | 930 | | 390 | 190 | | 220 | 890 | | 330 | 1,100 | | 160 | 310 |
| PHF | 0.96 | | 0.96 | | 0.92 | 0.92 | | 0.96 | 0.96 | | 0.92 | 0.92 | | 0.92 | 0.92 |
| Total Lanes | 1 | | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 |
| Terrain | Level | | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level |
| Grade % | 2.0% | | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% |
| 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 |
| $f_{HV}$ | 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 |
| On Flow (pcph) | 911 | | 978 | | 428 | 209 | | 231 | 936 | | 362 | 1,208 | | 176 | 340 |
| On Flow (pcphpl) | 911 | | 978 | | 428 | 209 | | 231 | 936 | | 362 | 1,208 | | 176 | 340 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right |
| On Ramp Speed (mph) | 35 | | 35 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 35 |
| On Ramp Cap (pcph) | 2,000 | | 2,000 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,000 |
| On Ramp v/c ratio | 0.46 | | 0.49 | | 0.23 | 0.10 | | 0.12 | 0.45 | | 0.19 | 0.58 | | 0.09 | 0.17 |

Project: Russell Ranch
Freeway Corridor: Westbound US 50

Alternative: Cumulative No Project Conditions
Time Period: AM Peak Hour

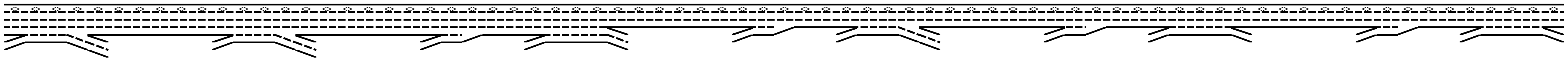
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



Key
<> Express Lane (HOV)
No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | |
| Off Volume (vph) | 950 | | 1,490 | | | 880 | | | 630 | | | 680 | | | 382 |
| PHF | 0.96 | | 0.92 | | | 0.96 | | | 0.92 | | | 0.92 | | | 0.92 |
| Total Lanes | 2 | | 2 | | | 2 | | | 2 | | | 1 | | | 1 |
| Terrain | Level | | Level | | | Level | | | Level | | | Level | | | Level |
| Grade % | 2.0% | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% |
| Grade Length (mi) | 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% |
| 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 | | | 0.990 | | | 0.990 | | | 0.990 | | | 0.990 |
| $f_P$ | 1.00 | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 |
| Off Flow (pcph) | 999 | | 1,636 | | | 926 | | | 692 | | | 747 | | | 419 |
| Off Flow (pcphpl) | 500 | | 818 | | | 463 | | | 346 | | | 747 | | | 419 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | Right | | | Right | | | Right | | | Right | | | Right |
| Off Ramp Speed | 25 | | 40 | | | 40 | | | 40 | | | 40 | | | 40 |
| Off Ramp Cap (pcph) | 3,800 | | 4,000 | | | 4,000 | | | 4,000 | | | 2,000 | | | 2,000 |
| Off Ramp v/c ratio | 0.26 | | 0.41 | | | 0.23 | | | 0.17 | | | 0.37 | | | 0.21 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane** | | | | | | | | | | | | | | | |
| Up Type | | | | | No | | | | On | | | On | | | On |
| Up Distance | | | | | | | | | 780 | | | 780 | | | #### |
| Up Flow (pcph) | | | | | | | | | 231 | | | 362 | | | 176 |
| Down Type | | | | | On | | | | On | | | On | | | No |
| Down Distance | | | | | 780 | | | | #### | | | #### | | | |
| Down Flow (pcph) | | | | | 209 | | | | 362 | | | 176 | | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | 3,537 | | | 3,129 | | | 3,528 | | | 4,087 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | 1,472 | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | | 0.586 | | | 0.586 | | | 0.586 | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | | 0.586 | | | 1.000 | | | 1.000 | | | 1.000 | |
| $v_{12}$ (pcph) | | | | | 2,073 | | | 3,129 | | | 3,528 | | | 4,087 | |
| $v_3$ (pcph) | | | | | 1,465 | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | 2,073 | | | 3,129 | | | 3,528 | | | 4,087 | |
| $v_{R12a}$ (pcph) | | | | | 2,501 | | | 3,360 | | | 3,890 | | | 4,263 | |
| Merge Speed Index | | | | | 0.35 | | | 0.42 | | | 0.50 | | | 0.58 | |
| Merge Area Speed | | | | | 60.1 | | | 58.3 | | | 56.1 | | | 53.7 | |
| Outer Lanes Volume | | | | | 1,465 | | | | | | | | | | |
| Outer Lanes Speed | | | | | 66.5 | | | | | | | | | | |
| Segment Speed | | | | | 62.3 | | | 58.3 | | | 56.1 | | | 53.7 | |
| Merge v/c ratio | | | | | 0.54 | | | 0.73 | | | 0.85 | | | 0.93 | |
| Merge Density | | | | | 22.9 | | | 29.7 | | | 33.8 | | | 36.8 | |
| Merge LOS | | | | | C | | | D | | | D | | | E | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



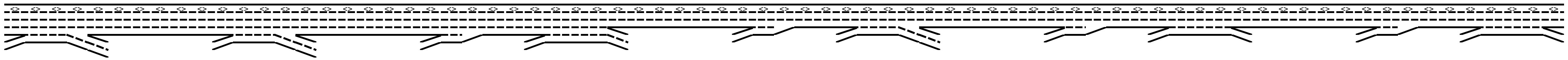
**Key**

<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | | |
| Diverge Speed Index | | | | | | | | | | | | | | | |
| Diverge Area Speed | | | | | | | | | | | | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | |
| Segment Speed | | | | | | | | | | | | | | | |
| Diverge v/c ratio | | | | | | | | | | | | | | | |
| Diverge Density | | | | | | | | | | | | | | | |
| Diverge LOS | | | | | | | | | | | | | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



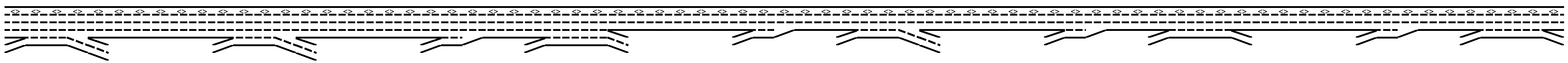
**Key**

<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | |
| Segment v/c ratio | #VALUE! | 0.56 | #VALUE! | 0.50 | 0.54 | 0.43 | 0.65 | 0.73 | 0.59 | 0.74 | 0.85 | #VALUE! | 0.85 | 0.93 | 0.63 |
| Segment Density | #VALUE! | 19.3 | #VALUE! | 17.3 | 22.9 | 14.6 | 22.8 | 29.7 | 20.5 | 26.7 | 33.8 | #VALUE! | 33.2 | 36.8 | 21.8 |
| Segment LOS | #VALUE! | C | #VALUE! | B | C | B | C | D | C | D | D | #VALUE! | D | E | C |
| Over Capacity | #VALUE! | | #VALUE! | | | | | | | | | #VALUE! | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

<> Express Lane (HOV)

No Trucks

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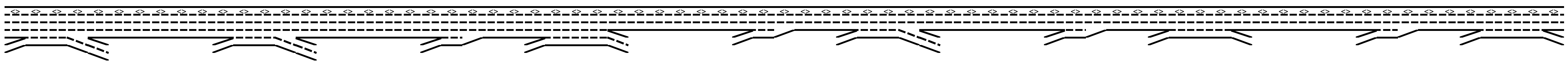
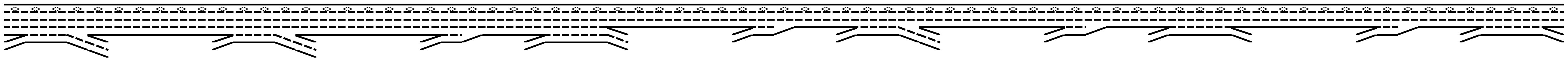
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave |
| Length (ft) | 3,500 | 2,500 | 4,000 | 1,650 | 780 | 3,500 | 1,650 | 780 | 5,000 | 1,650 | 780 | 2,000 | 1,400 | 1,250 | 10,500 |
| Accel Length | | | | | 300 | | | 300 | | | 300 | | | 300 | |
| Decel Length | | | | | | | | | | | | | | | |
| Mainline Volume | 3,241 | 3,050 | 3,050 | 3,440 | 3,440 | 3,970 | 3,150 | 3,150 | 3,550 | 3,960 | 3,960 | 4,230 | 4,700 | 4,700 | 4,740 |
| On Ramp Volume | 199 | | 1,140 | | 530 | 100 | | 400 | 860 | | 270 | 1,030 | | 40 | 470 |
| Off Ramp Volume | 390 | | 750 | | | 920 | | | 450 | | | 560 | | | 263 |
| Express Lane Volume | 551 | 519 | 519 | 585 | 585 | 675 | 536 | 536 | 604 | 673 | 673 | 719 | 799 | 799 | 806 |
| EL On Ramp Volume | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | |
| | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | |
| GP Volume (vph) | 2,889 | 2,532 | 3,672 | 2,855 | 3,385 | 3,395 | 2,615 | 3,015 | 3,807 | 3,287 | 3,557 | 4,541 | 3,901 | 3,941 | 4,404 |
| PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.98 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| GP Lanes | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |
| Terrain | Grade | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Grade | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -6.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 4.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.943 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 |
| GP Flow (pcph) | 3,234 | 2,834 | 4,110 | 3,290 | 3,790 | 3,643 | 2,805 | 3,234 | 4,001 | 3,526 | 3,816 | 4,872 | 4,185 | 4,228 | 4,725 |
| GP Flow (pcphpl) | 809 | 945 | 1,028 | 1,097 | 1,263 | 911 | 1,403 | 1,617 | 1,334 | 1,763 | 1,908 | 1,624 | 2,093 | 2,114 | 1,575 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calculated FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS Curve | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | |
| v/c ratio | 0.34 | 0.39 | 0.43 | 0.46 | 0.53 | 0.38 | 0.58 | 0.67 | 0.56 | 0.73 | 0.80 | 0.68 | 0.87 | 0.88 | 0.66 |
| Speed (mph) | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 69.5 | 68.0 | 69.8 | 66.3 | 64.2 | 67.9 | 60.8 | 60.3 | 68.4 |
| Density (pcphpl) | 11.6 | 13.5 | 14.7 | 15.7 | 18.1 | 13.0 | 20.2 | 23.8 | 19.1 | 26.6 | 29.7 | 23.9 | 34.4 | 35.1 | 23.0 |
| LOS | B | B | B | B | C | B | C | C | C | D | D | C | D | E | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 3,016 | | 2,936 | | 3,208 | 3,533 | | 2,813 | 3,091 | | 3,531 | 3,783 | | 4,186 | 4,228 |
| $GP_{IN}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 7,200 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{IN}$ v/c ratio | 0.42 | | 0.41 | | 0.45 | 0.49 | | 0.59 | 0.64 | | 0.74 | 0.79 | | 0.87 | 0.88 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 2,833 | | 3,287 | | 3,790 | 2,675 | | 3,234 | 3,527 | | 3,816 | 4,283 | | 4,228 | 4,449 |
| $GP_{OUT}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{OUT}$ v/c ratio | 0.39 | | 0.46 | | 0.53 | 0.56 | | 0.67 | 0.73 | | 0.80 | 0.89 | | 0.88 | 0.93 |



Key
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | |
| EL Volume (vph) | 551 | 519 | 519 | 585 | 585 | 675 | 536 | 536 | 604 | 673 | 673 | 719 | 799 | 799 | 806 |
| PHF | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Grade | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -6.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| 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% | 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% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 2.5 | 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 | 4.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.990 | 0.990 | 0.990 | 0.971 | 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 | 1.00 |
| EL Flow (pcph) | 605 | 569 | 546 | 627 | 615 | 710 | 563 | 563 | 635 | 708 | 708 | 757 | 823 | 823 | 830 |
| EL Flow (pcphpl) | 605 | 569 | 546 | 627 | 615 | 710 | 563 | 563 | 635 | 708 | 708 | 757 | 823 | 823 | 830 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calc'd FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.35 | 0.33 | 0.31 | 0.36 | 0.35 | 0.41 | 0.32 | 0.32 | 0.36 | 0.40 | 0.40 | 0.43 | 0.47 | 0.47 | 0.47 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | |
| On Volume (vph) | 199 | | 1,140 | | 530 | 100 | | 400 | 860 | | 270 | 1,030 | | 40 | 470 |
| PHF | 0.92 | | 0.98 | | 0.92 | 0.92 | | 0.96 | 0.96 | | 0.96 | 0.96 | | 0.96 | 0.96 |
| Total Lanes | 1 | | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 |
| Terrain | Level | | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level |
| Grade % | 2.0% | | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% |
| 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% | 3.0% | | 3.0% | 3.0% | | 3.0% | 3.0% |
| 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 |
| $f_{HV}$ | 0.990 | | 0.990 | | 0.990 | 0.990 | | 0.990 | 0.985 | | 0.985 | 0.985 | | 0.985 | 0.985 |
| $f_P$ | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 |
| On Flow (pcph) | 218 | | 1,175 | | 582 | 110 | | 421 | 909 | | 285 | 1,089 | | 42 | 497 |
| On Flow (pcphpl) | 218 | | 1,175 | | 582 | 110 | | 421 | 909 | | 285 | 1,089 | | 42 | 497 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right |
| On Ramp Speed (mph) | 35 | | 35 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 35 |
| On Ramp Cap (pcph) | 2,000 | | 2,000 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,000 |
| On Ramp v/c ratio | 0.11 | | 0.59 | | 0.31 | 0.05 | | 0.22 | 0.43 | | 0.15 | 0.52 | | 0.02 | 0.25 |

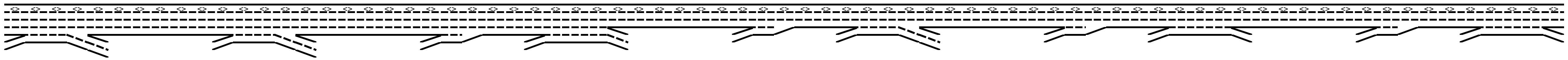
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



Key
<> Express Lane (HOV)
No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | |
| Off Volume (vph) | 390 | | 750 | | | 920 | | | 450 | | | 560 | | | 263 |
| PHF | 0.98 | | 0.92 | | | 0.96 | | | 0.96 | | | 0.96 | | | 0.96 |
| Total Lanes | 2 | | 2 | | | 2 | | | 2 | | | 1 | | | 1 |
| Terrain | Level | | Level | | | Level | | | Level | | | Level | | | Level |
| Grade % | 2.0% | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% |
| Grade Length (mi) | 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% |
| 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 | | | 0.990 | | | 0.990 | | | 0.990 | | | 0.990 |
| $f_P$ | 1.00 | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 |
| Off Flow (pcph) | 402 | | 823 | | | 968 | | | 473 | | | 589 | | | 277 |
| Off Flow (pcphpl) | 201 | | 412 | | | 484 | | | 237 | | | 589 | | | 277 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | Right | | | Right | | | Right | | | Right | | | Right |
| Off Ramp Speed | 25 | | 40 | | | 40 | | | 40 | | | 40 | | | 40 |
| Off Ramp Cap (pcph) | 3,800 | | 4,000 | | | 4,000 | | | 4,000 | | | 2,000 | | | 2,000 |
| Off Ramp v/c ratio | 0.11 | | 0.21 | | | 0.24 | | | 0.12 | | | 0.29 | | | 0.14 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane** | | | | | | | | | | | | | | | |
| Up Type | | | | | No | | | | On | | | On | | | On |
| Up Distance | | | | | | | | | 780 | | | 780 | | | #### |
| Up Flow (pcph) | | | | | | | | | 421 | | | 285 | | | 42 |
| Down Type | | | | | On | | | | On | | | On | | | #### |
| Down Distance | | | | | 780 | | | | #### | | | #### | | | #### |
| Down Flow (pcph) | | | | | 110 | | | | #### | | | 497 | | | #### |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | 3,208 | | | 2,813 | | | 3,531 | | | 4,186 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | 775 | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | | 0.586 | | | 0.586 | | | 0.586 | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | | 0.586 | | | 1.000 | | | 1.000 | | | 1.000 | |
| $v_{12}$ (pcph) | | | | | 1,880 | | | 2,813 | | | 3,531 | | | 4,186 | |
| $v_3$ (pcph) | | | | | 1,328 | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | 1,880 | | | 2,813 | | | 3,531 | | | 4,186 | |
| $v_{R12a}$ (pcph) | | | | | 2,461 | | | 3,234 | | | 3,816 | | | 4,228 | |
| Merge Speed Index | | | | | 0.35 | | | 0.41 | | | 0.48 | | | 0.57 | |
| Merge Area Speed | | | | | 60.2 | | | 58.7 | | | 56.5 | | | 53.9 | |
| Outer Lanes Volume | | | | | 1,328 | | | | | | | | | | |
| Outer Lanes Speed | | | | | 67.0 | | | | | | | | | | |
| Segment Speed | | | | | 62.4 | | | 58.7 | | | 56.5 | | | 53.9 | |
| Merge v/c ratio | | | | | 0.54 | | | 0.70 | | | 0.83 | | | 0.92 | |
| Merge Density | | | | | 22.5 | | | 28.6 | | | 33.2 | | | 36.6 | |
| Merge LOS | | | | | C | | | D | | | D | | | E | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



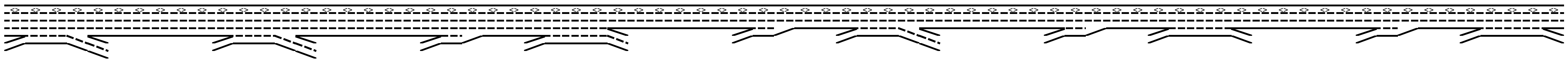
**Key**

<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | | |
| Diverge Speed Index | | | | | | | | | | | | | | | |
| Diverge Area Speed | | | | | | | | | | | | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | |
| Segment Speed | | | | | | | | | | | | | | | |
| Diverge v/c ratio | | | | | | | | | | | | | | | |
| Diverge Density | | | | | | | | | | | | | | | |
| Diverge LOS | | | | | | | | | | | | | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

<> Express Lane (HOV)

No Trucks

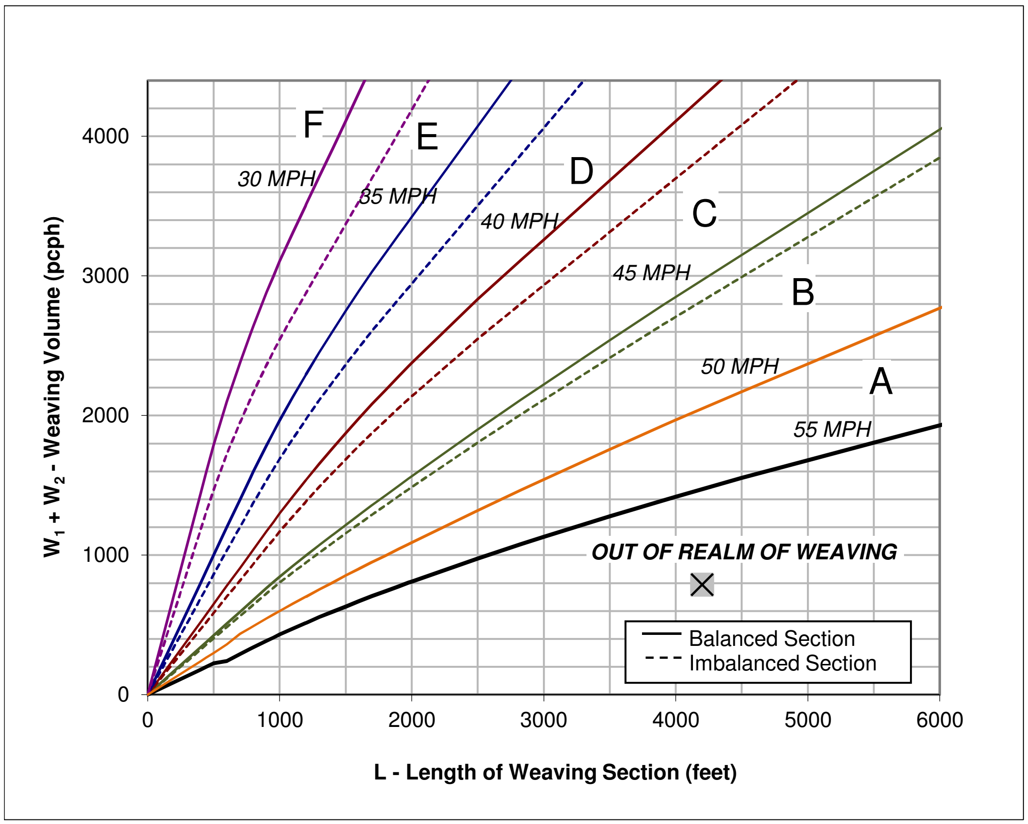
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Summarize Segment Operations** | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.34 | 0.39 | #VALUE! | 0.46 | 0.54 | 0.38 | 0.58 | 0.70 | 0.56 | 0.73 | 0.83 | #VALUE! | 0.87 | 0.92 | 0.66 |
| Segment Density | 11.6 | 13.5 | #VALUE! | 15.7 | 22.5 | 13.0 | 20.2 | 28.6 | 19.1 | 26.6 | 33.2 | #VALUE! | 34.4 | 36.6 | 23.0 |
| Segment LOS | B | B | #VALUE! | B | C | B | C | D | C | D | D | #VALUE! | D | E | C |
| Over Capacity | | | #VALUE! | | | | | | | | | #VALUE! | | | |

# Leisch Method for Weaving Analysis

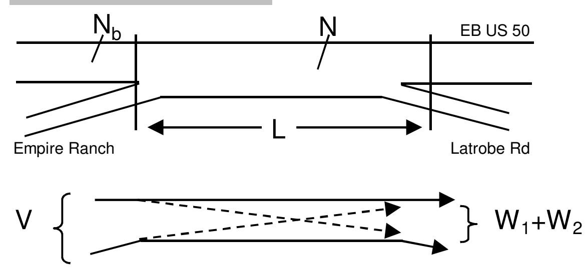
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,200 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | EB US 50 |
| On-ramp | Empire Ranch |
| Off-ramp | Latrobe Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,830 | Volume (vph)* | 190 | Volume (vph)* | 590 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 2.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,175 | Volume (pcph) | 192 | Volume (pcph) | 596 |




## 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?

   **MPH** and **MPH**

   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) 52.7
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 835
6. Level of Service (LOS) A

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.

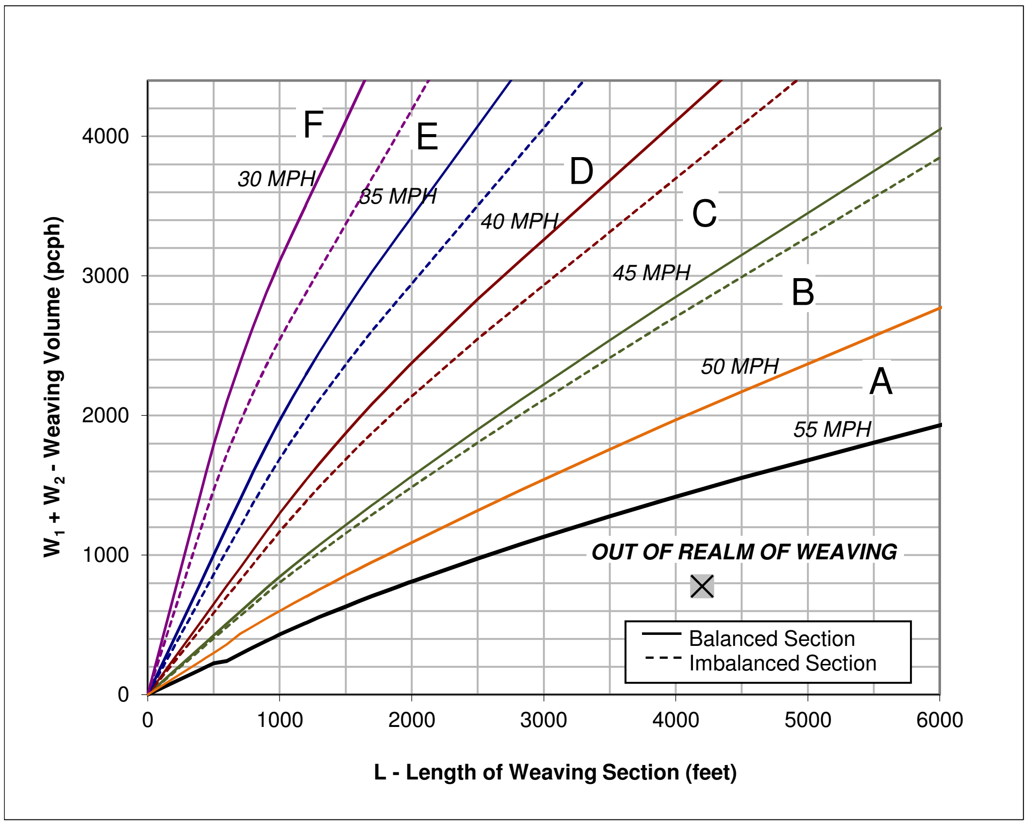
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

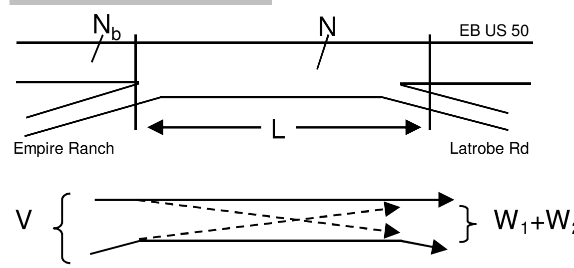
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,200 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | EB US 50 |
| On-ramp | Empire Ranch |
| Off-ramp | Latrobe Rd |

| | Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) |
|---|---|---|---|---|---|
| Volume (vph)* | 5,550 | Volume (vph)* | 210 | Volume (vph)* | 560 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,717 | Volume (pcph) | 212 | Volume (pcph) | 566 |




## 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?
   **MPH** and **MPH**
   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) 52.6
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,143
6. Level of Service (LOS) B

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

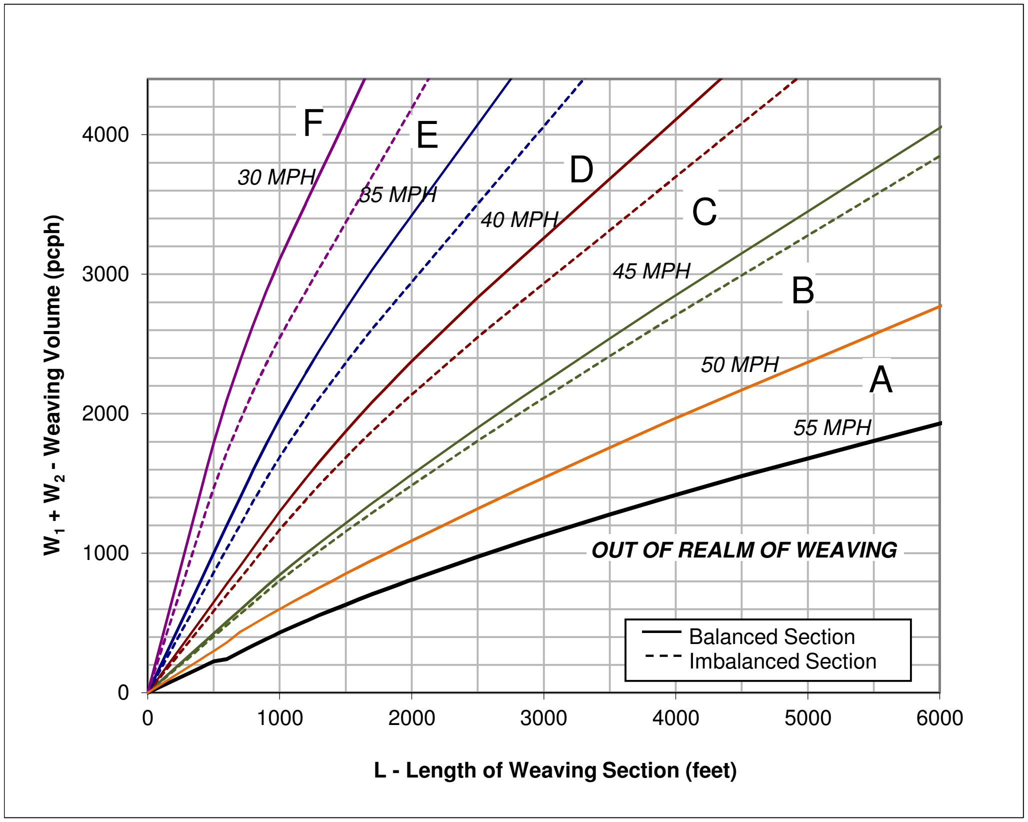
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 11,700 |

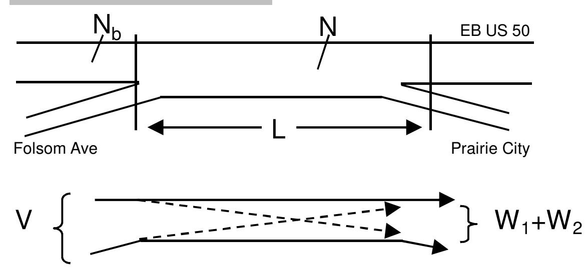
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | EB US 50 |
| On-ramp | Folsom Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,380 | Volume (vph)* | 306 | Volume (vph)* | 290 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,541 | Volume (pcph) | 309 | Volume (pcph) | 293 |




## 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?
   **MPH** and **MPH**
   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) **50.9**
4. Weaving Intensity Factor (k) **1.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]$ **1,385**
6. 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

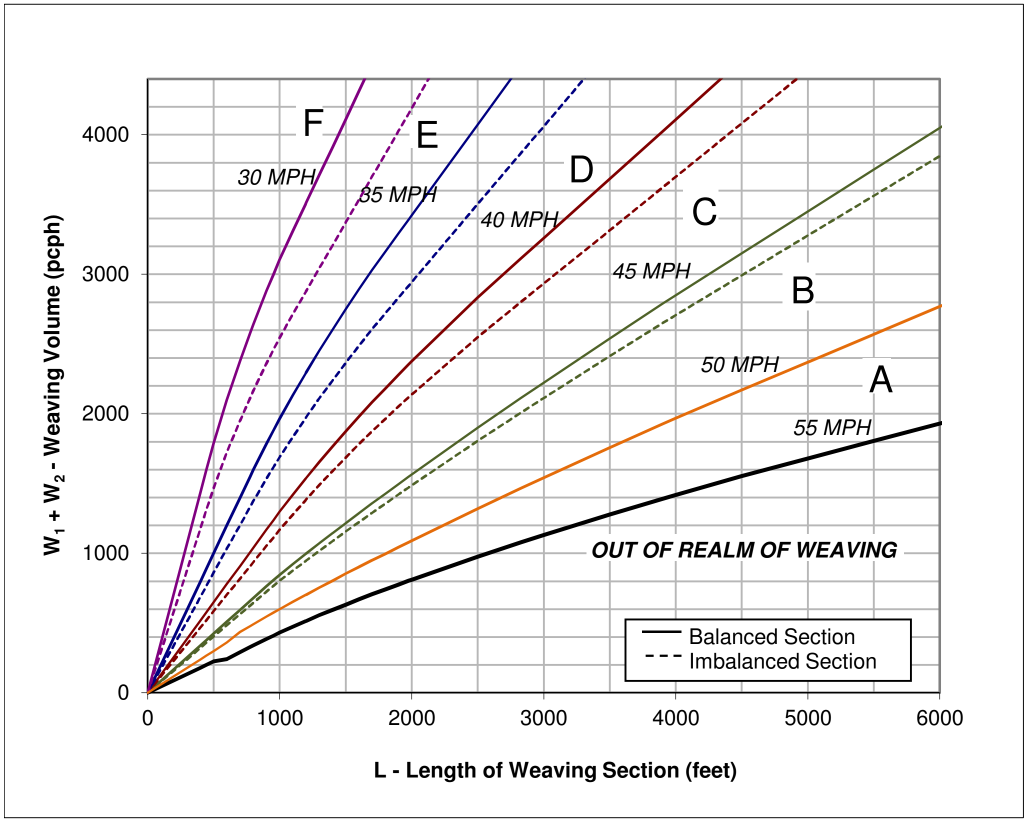
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 11,700 |

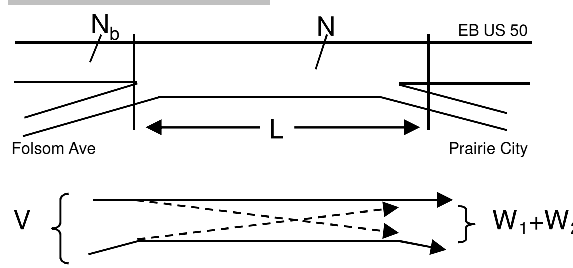
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | EB US 50 |
| On-ramp | Folsom Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 6,650 | Volume (vph)* | 306 | Volume (vph)* | 960 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 6,850 | Volume (pcph) | 309 | Volume (pcph) | 970 |




## 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?

   **MPH** and **MPH**

   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) 51.9
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,712
6. 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.

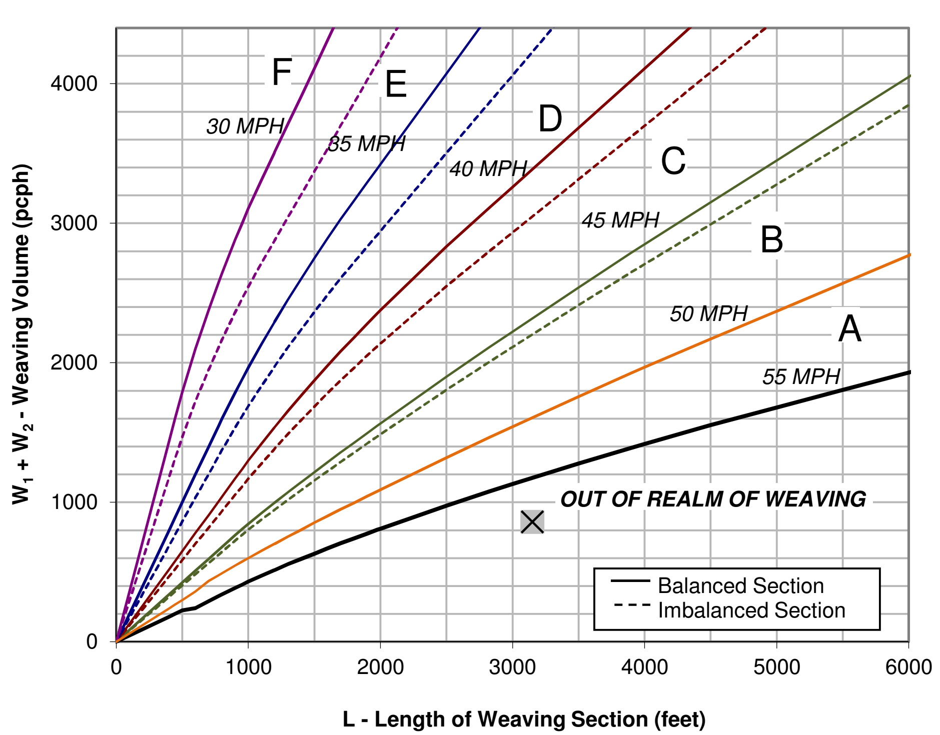
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

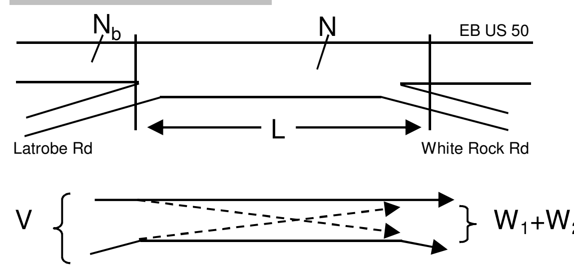
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,150 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | EB US 50 |
| On-ramp | Latrobe Rd |
| Off-ramp | White Rock Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,480 | Volume (vph)* | 470 | Volume (vph)* | 319 |
| Truck Percentage | 6% | Truck Percentage | 6% | Truck Percentage | 6% |
| PCE for Trucks | 2.5 | PCE for Trucks | 2.5 | PCE for Trucks | 2.5 |
| Volume (pcph) | 3,793 | Volume (pcph) | 512 | Volume (pcph) | 348 |




## 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?
   **MPH** and **MPH**

   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) 53.7
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 759
6. Level of Service (LOS) A

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

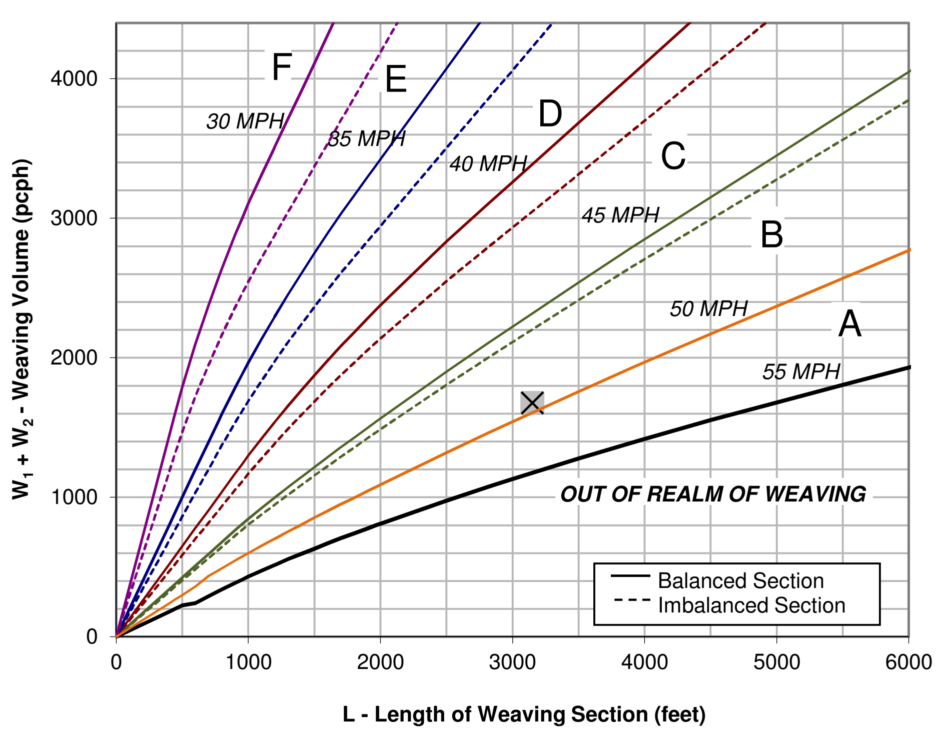
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,150 |

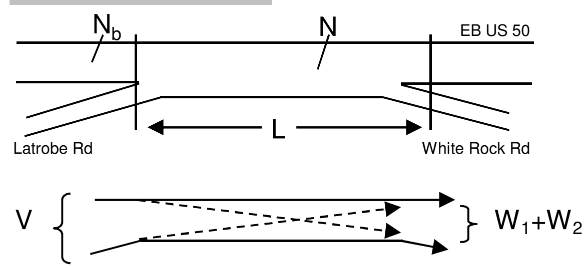
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | EB US 50 |
| On-ramp | Latrobe Rd |
| Off-ramp | White Rock Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,270 | Volume (vph)* | 860 | Volume (vph)* | 800 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 2.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,586 | Volume (pcph) | 869 | Volume (pcph) | 808 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**
   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) **49.5**
4. Weaving Intensity Factor (k) **1.27**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,160**
6. Level of Service (LOS) **B**

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

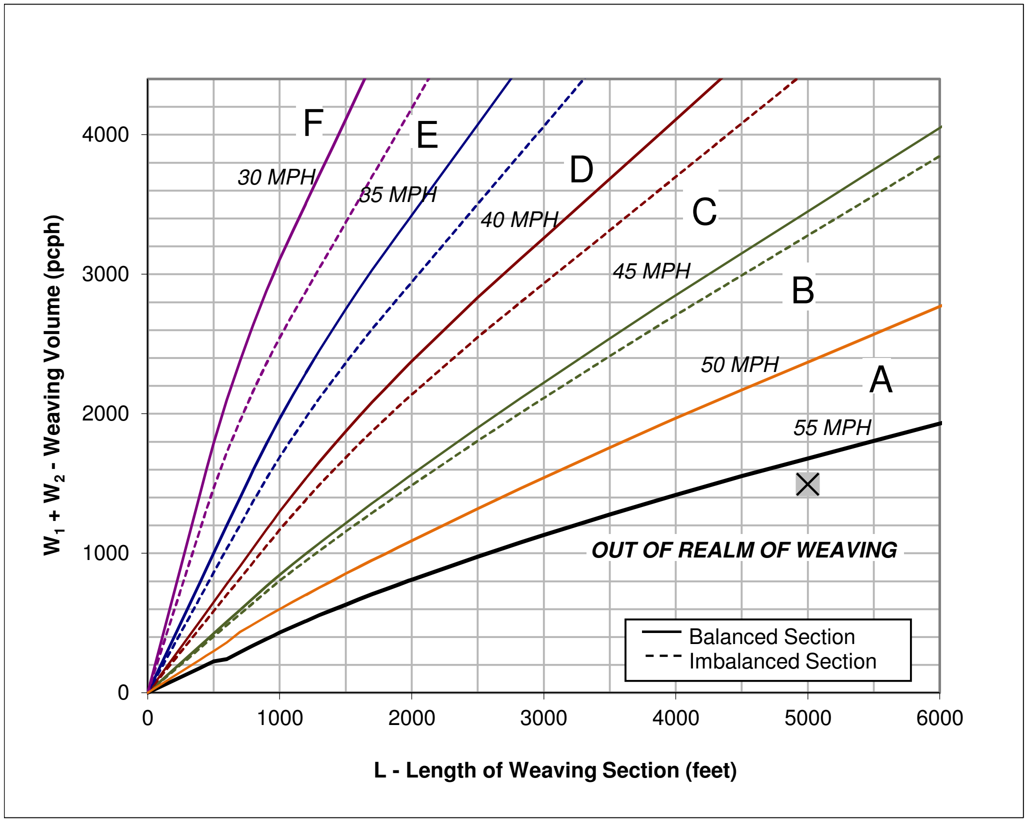
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

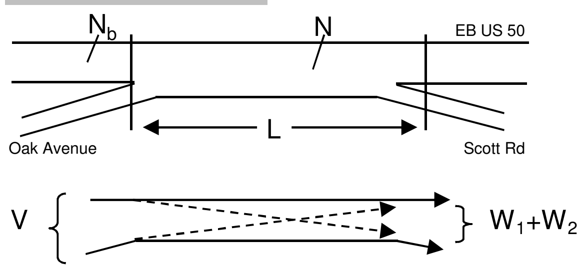
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | EB US 50 |
| On-ramp | Oak Avenue |
| Off-ramp | Scott Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,800 | Volume (vph)* | 140 | Volume (vph)* | 1,340 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,944 | Volume (pcph) | 141 | Volume (pcph) | 1,353 |




## 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?
   MPH and MPH
   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) 54.4
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,236
6. 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

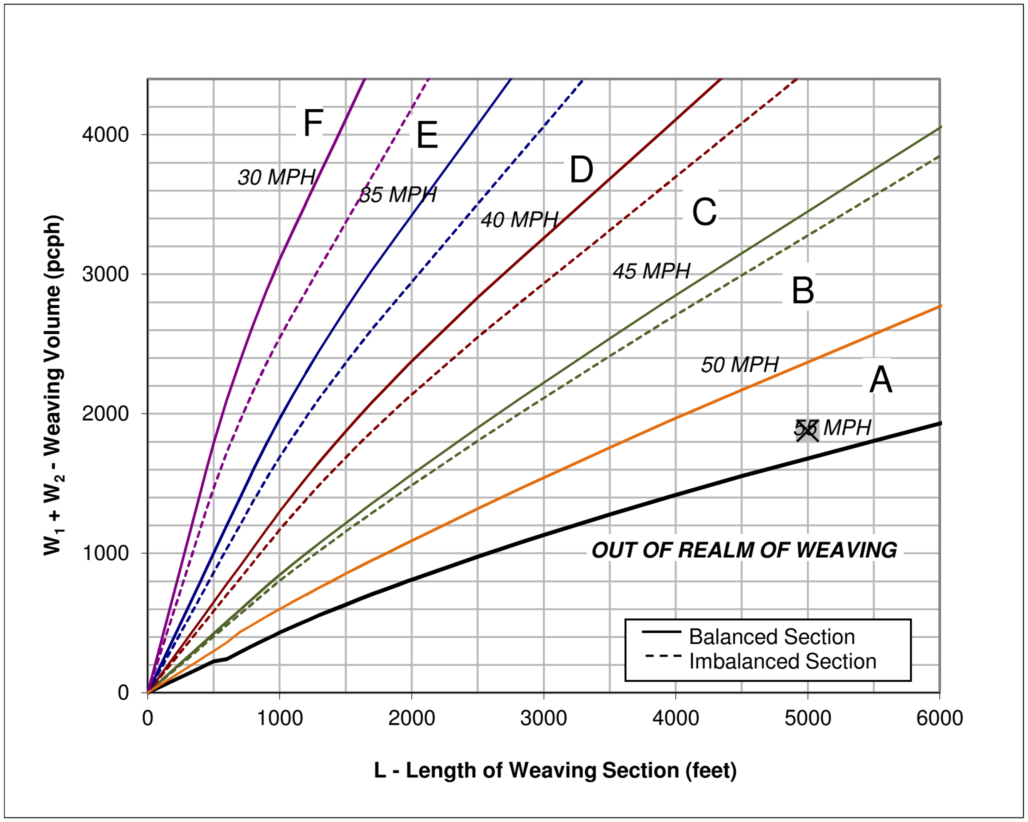
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

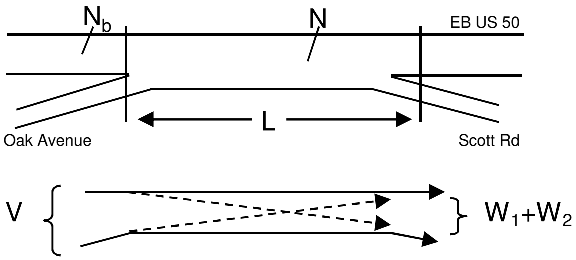
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | EB US 50 |
| On-ramp | Oak Avenue |
| Off-ramp | Scott Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,660 | Volume (vph)* | 350 | Volume (vph)* | 1,510 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,830 | Volume (pcph) | 354 | Volume (pcph) | 1,525 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **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.
3. Interpolated Weaving Speed ($S_w$, mph) 53.6
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,457
6. 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

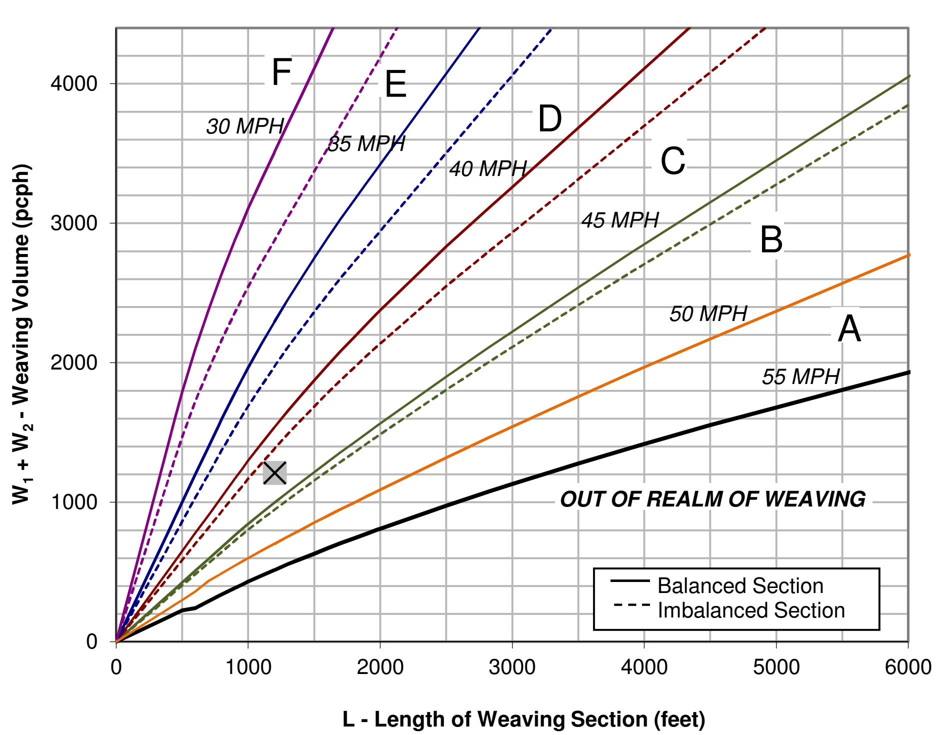
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 1,200 |

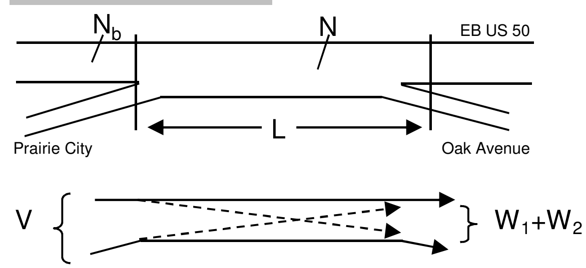
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | EB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Oak Avenue |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,430 | Volume (vph)* | 290 | Volume (vph)* | 910 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,593 | Volume (pcph) | 293 | Volume (pcph) | 919 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **40 MPH** and **45 MPH**
   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) 43.0
4. Weaving Intensity Factor (k) 2.87
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,535
6. 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

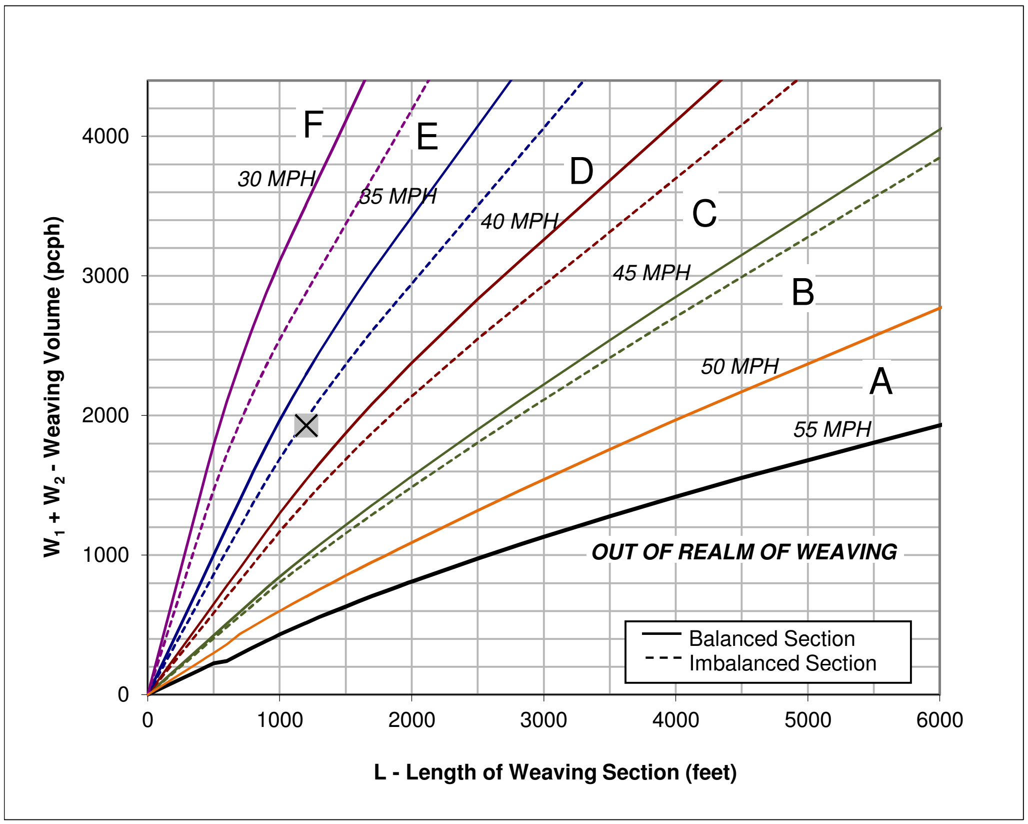
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 1,200 |

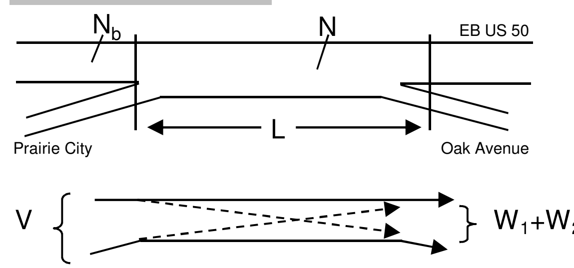
| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 6,440 | Volume (vph)* | 630 | Volume (vph)* | 1,280 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 6,633 | Volume (pcph) | 636 | Volume (pcph) | 1,293 |

## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | EB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Oak Avenue |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **35 MPH** and **40 MPH**
   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) — 37.4
4. Weaving Intensity Factor (k) — 2.75
5. Service Volume (SV, pcph)
   SV = (1/N)*[V + (k - 1)*min($W_1$, $W_2$)] — 1,937
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

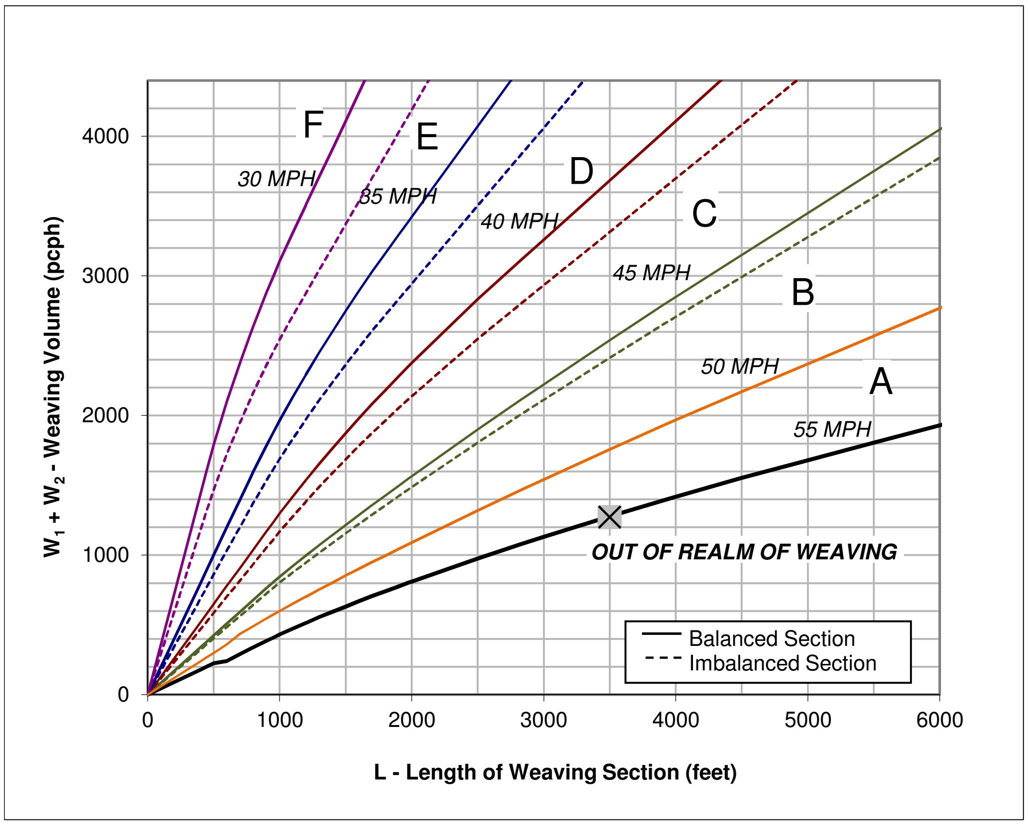
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

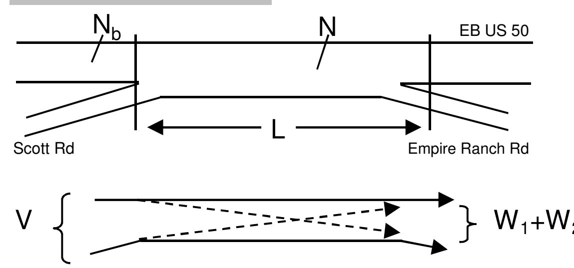
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | EB US 50 |
| On-ramp | Scott Rd |
| Off-ramp | Empire Ranch Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,050 | Volume (vph)* | 470 | Volume (vph)* | 790 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 4.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,779 | Volume (pcph) | 475 | Volume (pcph) | 798 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **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.
3. Interpolated Weaving Speed ($S_w$, mph) 55.1
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 956
6. Level of Service (LOS) B

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

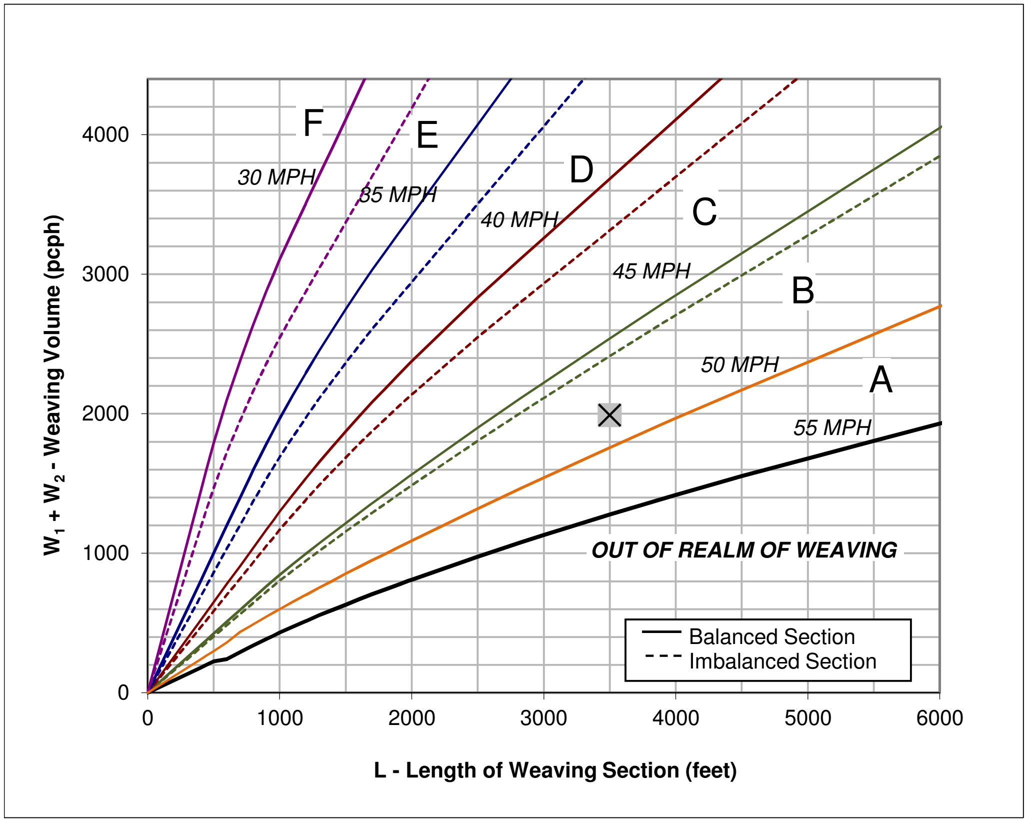
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

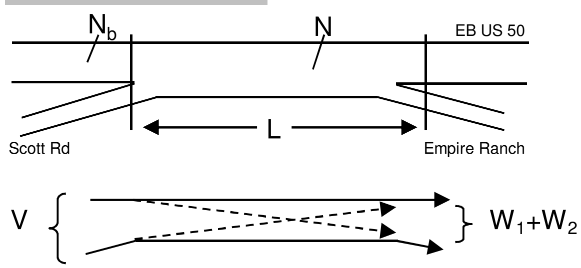
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | EB US 50 |
| On-ramp | Scott Rd |
| Off-ramp | Empire Ranch |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,880 | Volume (vph)* | 890 | Volume (vph)* | 1,080 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 4.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 6,938 | Volume (pcph) | 899 | Volume (pcph) | 1,091 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**

   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) **48.5**
4. Weaving Intensity Factor (k) **1.44**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,466**
6. 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

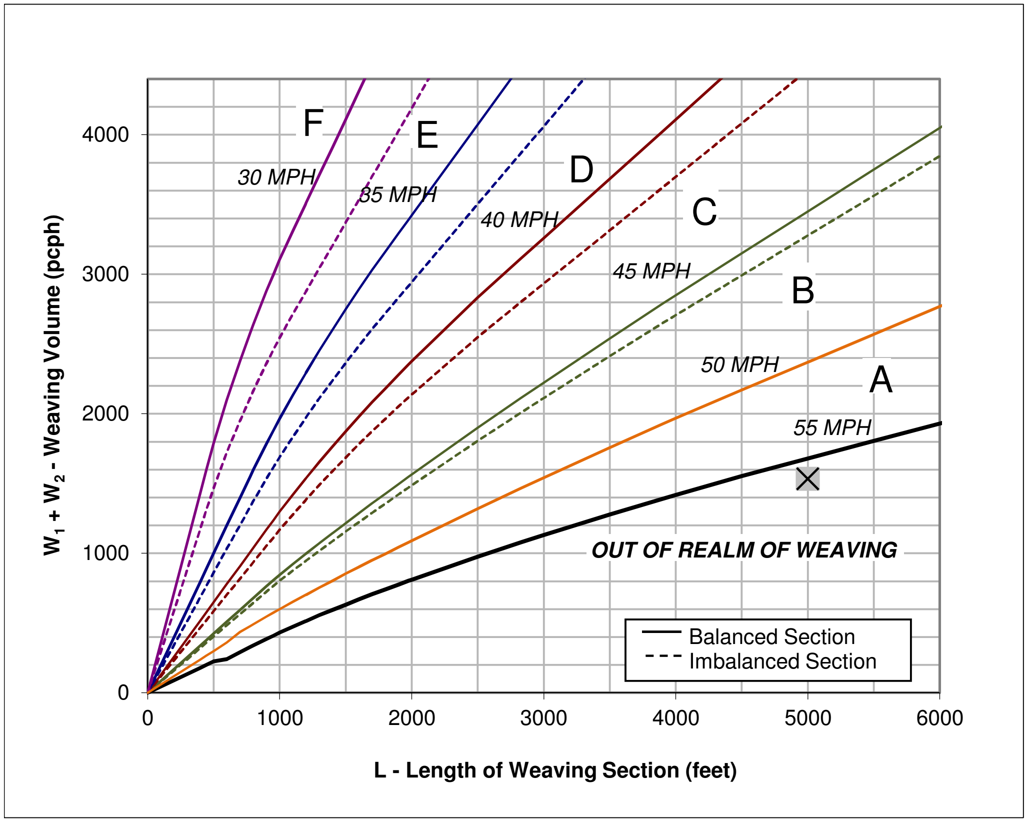
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

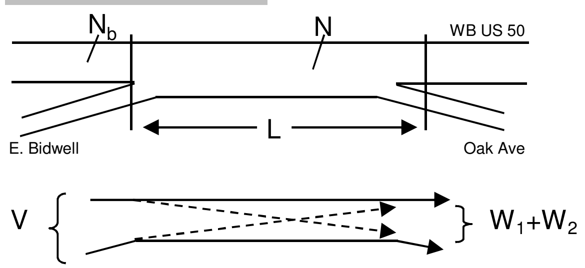
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | WB US 50 |
| On-ramp | E. Bidwell |
| Off-ramp | Oak Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,750 | Volume (vph)* | 890 | Volume (vph)* | 630 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,893 | Volume (pcph) | 899 | Volume (pcph) | 636 |




## 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?
   **MPH** and **MPH**
   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) **54.6**
4. Weaving Intensity Factor (k) **1.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,223**
6. 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

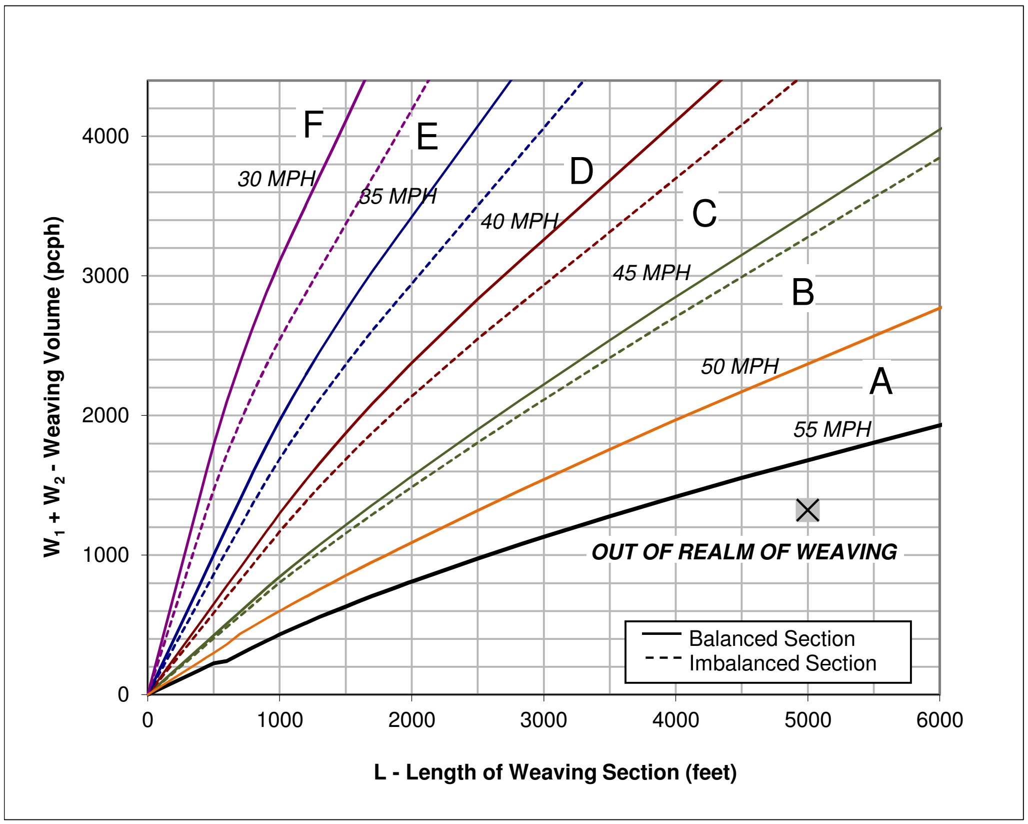
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

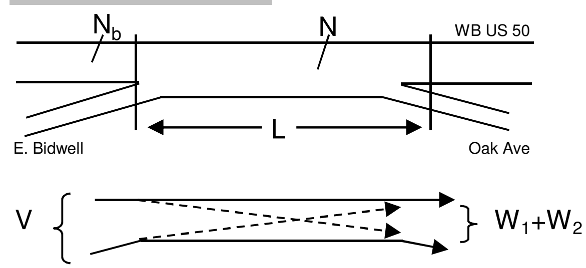
| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,410 | Volume (vph)* | 860 | Volume (vph)* | 450 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,542 | Volume (pcph) | 869 | Volume (pcph) | 455 |

## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | WB US 50 |
| On-ramp | E. Bidwell |
| Off-ramp | Oak Ave |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **MPH** and **MPH**
   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) 53.9
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   SV = (1/N)*[V + (k - 1)*min($W_1$, $W_2$)] 1,136
6. 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

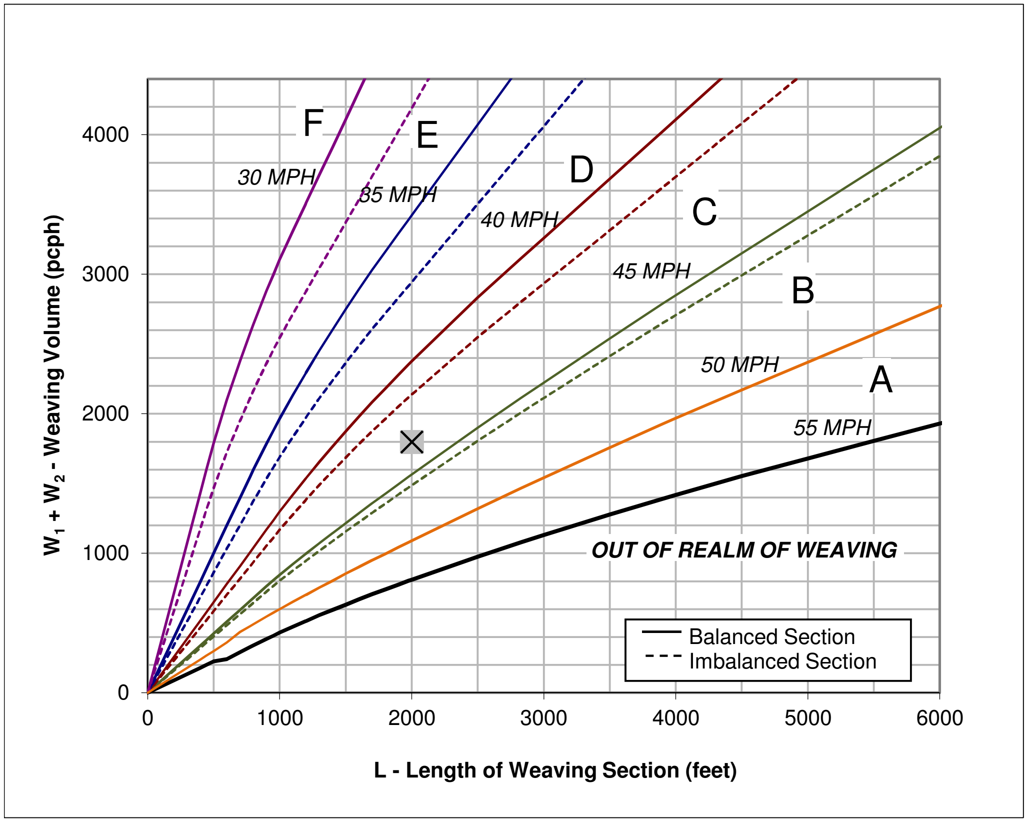
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 2,000 |

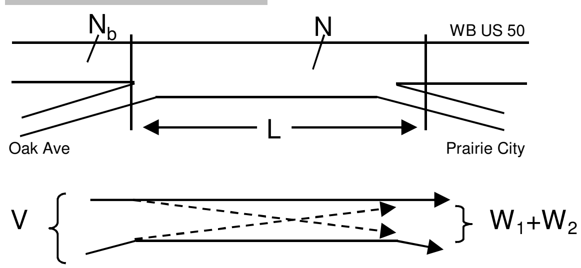
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | WB US 50 |
| On-ramp | Oak Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,550 | Volume (vph)* | 1,100 | Volume (vph)* | 680 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,717 | Volume (pcph) | 1,111 | Volume (pcph) | 687 |




**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?
   **40 MPH** and **45 MPH**
   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) — 42.6
4. Weaving Intensity Factor (k) — 2.27
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ — 1,647
6. 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, July 24, 2009

# Leisch Method for Weaving Analysis

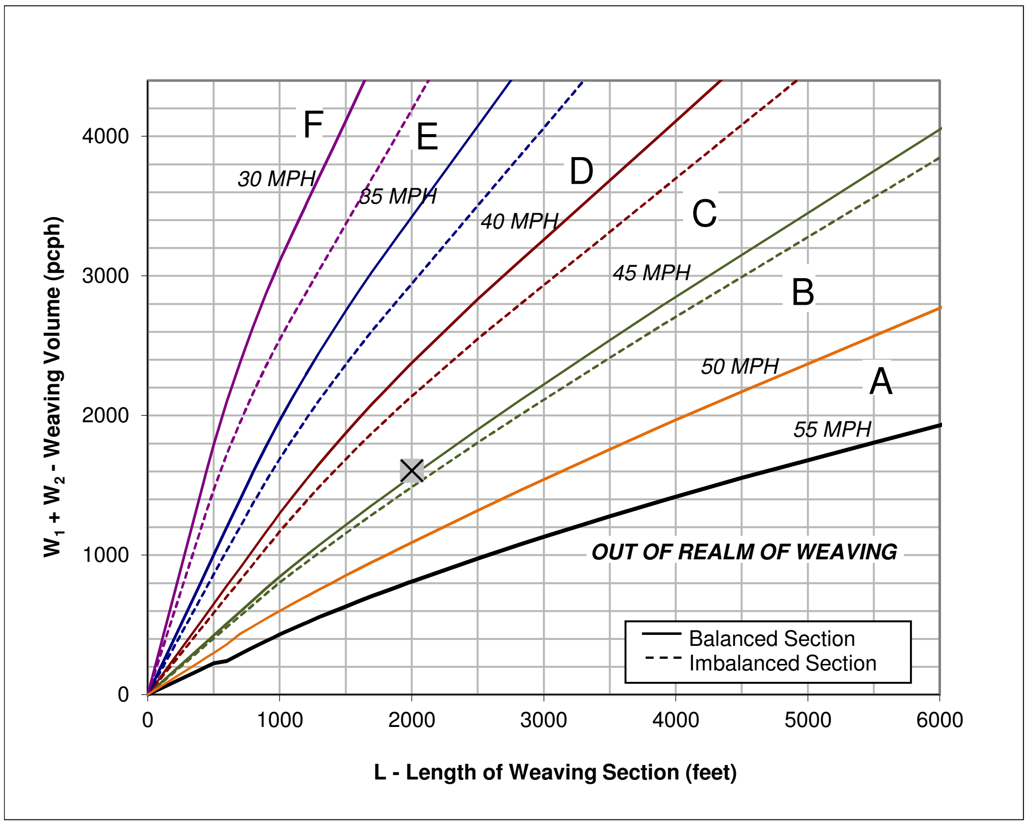
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 2,000 |

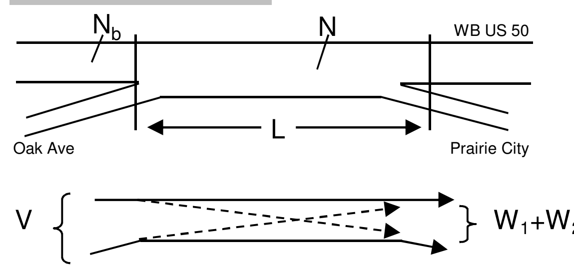
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | WB US 50 |
| On-ramp | Oak Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,260 | Volume (vph)* | 1,030 | Volume (vph)* | 560 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,418 | Volume (pcph) | 1,040 | Volume (pcph) | 566 |




## 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?
   **40 MPH** and **45 MPH**
   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) 44.1
4. Weaving Intensity Factor (k) 2.09
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,508
6. 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.

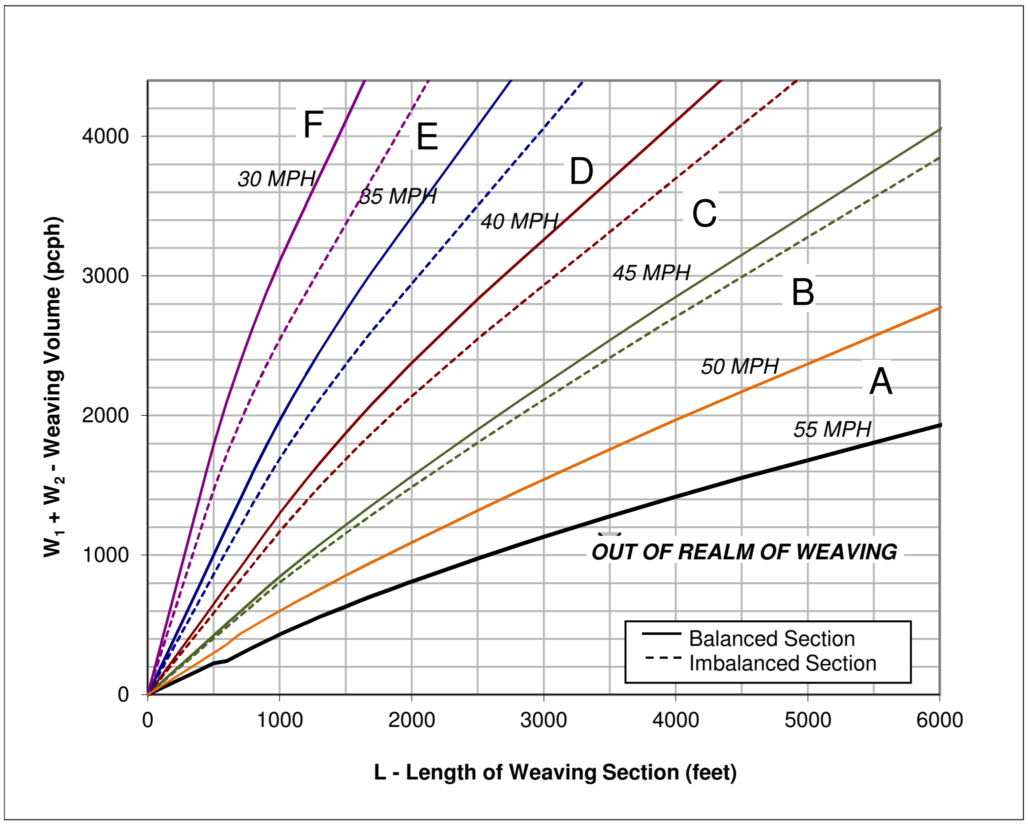
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

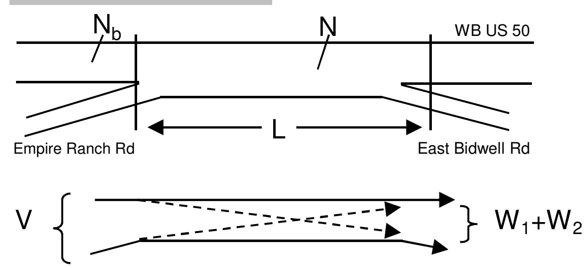
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | WB US 50 |
| On-ramp | Empire Ranch Rd |
| Off-ramp | East Bidwell Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,520 | Volume (vph)* | 190 | Volume (vph)* | 880 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,656 | Volume (pcph) | 192 | Volume (pcph) | 889 |




**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?
   **45 MPH** and **50 MPH**
   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) 55.2
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 931
6. Level of Service (LOS) B

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

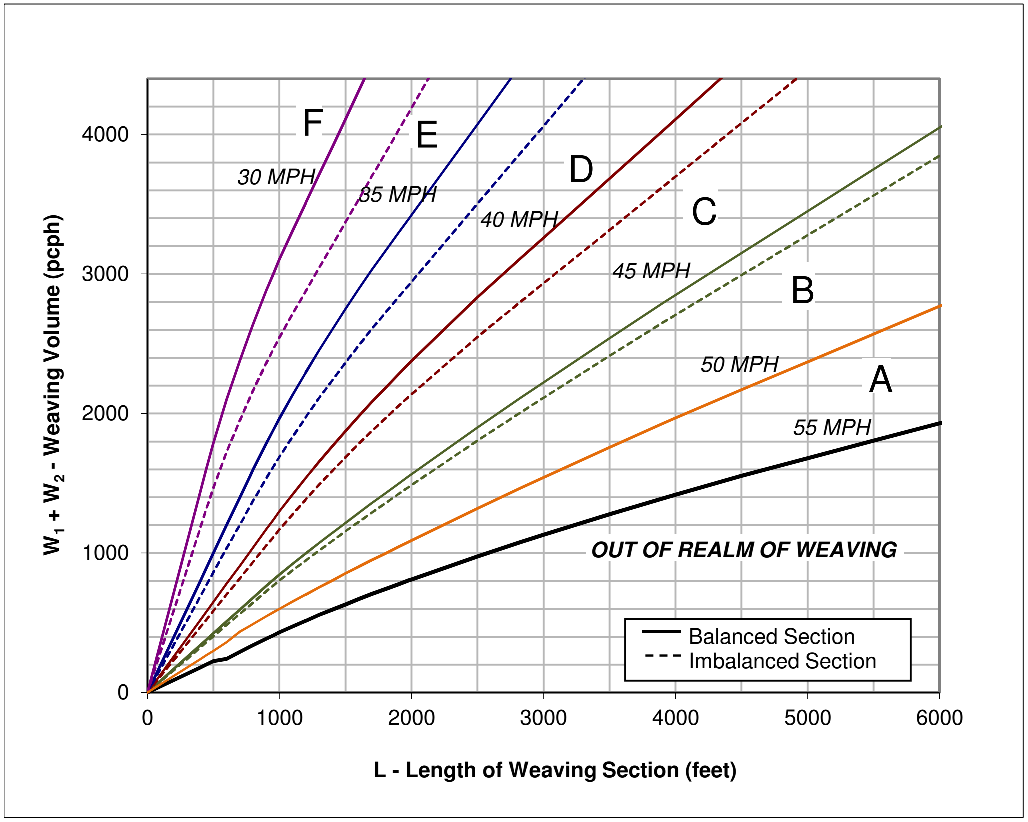
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

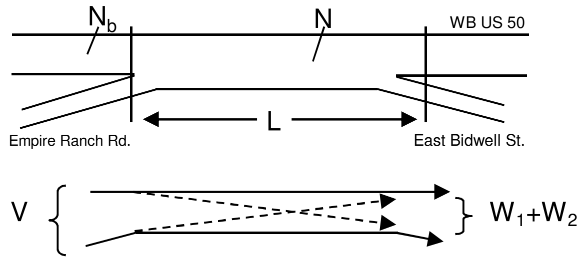
| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,070 | Volume (vph)* | 100 | Volume (vph)* | 920 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,192 | Volume (pcph) | 101 | Volume (pcph) | 929 |

## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | WB US 50 |
| On-ramp | Empire Ranch Rd. |
| Off-ramp | East Bidwell St. |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **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.
3. Interpolated Weaving Speed ($S_w$, mph) 57.6
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 838
6. Level of Service (LOS) A

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

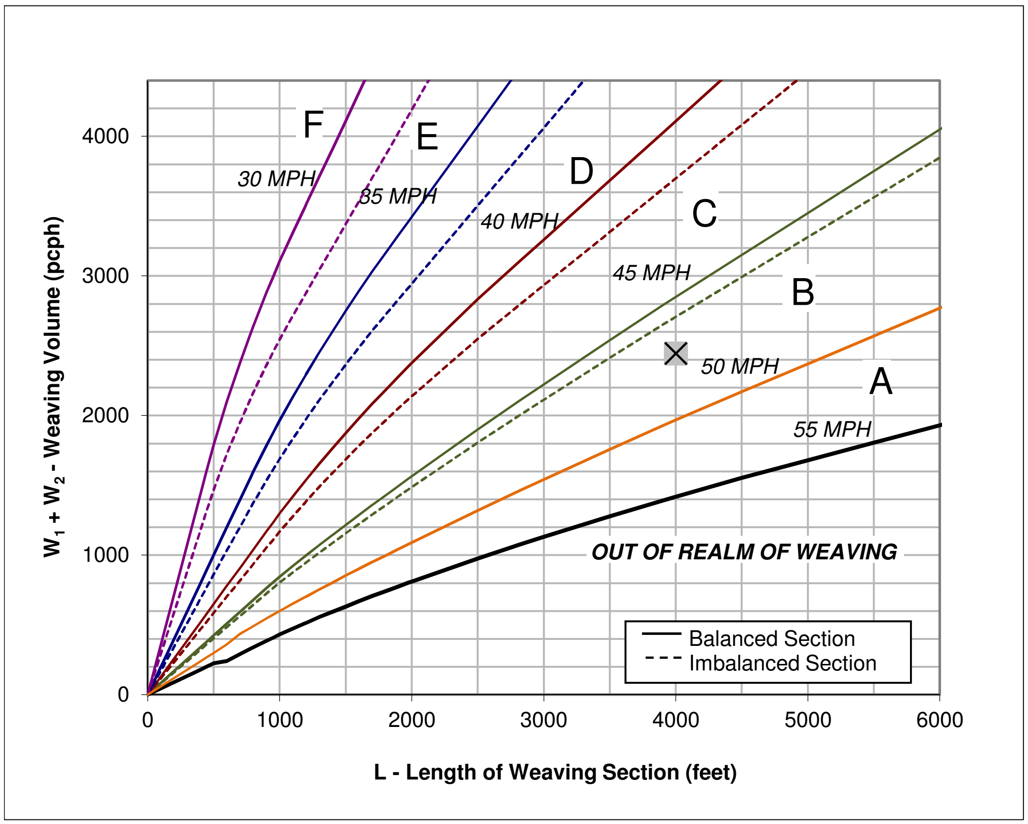
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,000 |

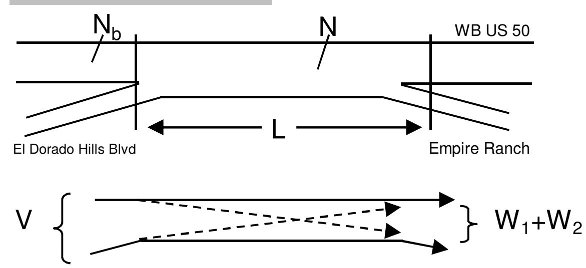
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | WB US 50 |
| On-ramp | El Dorado Hills Blvd |
| Off-ramp | Empire Ranch |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,430 | Volume (vph)* | 930 | Volume (vph)* | 1,490 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,593 | Volume (pcph) | 939 | Volume (pcph) | 1,505 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   [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?

   **45 MPH** and **50 MPH**

   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) — 47.3
4. Weaving Intensity Factor (k) — 1.63
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ — 1,237
6. 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

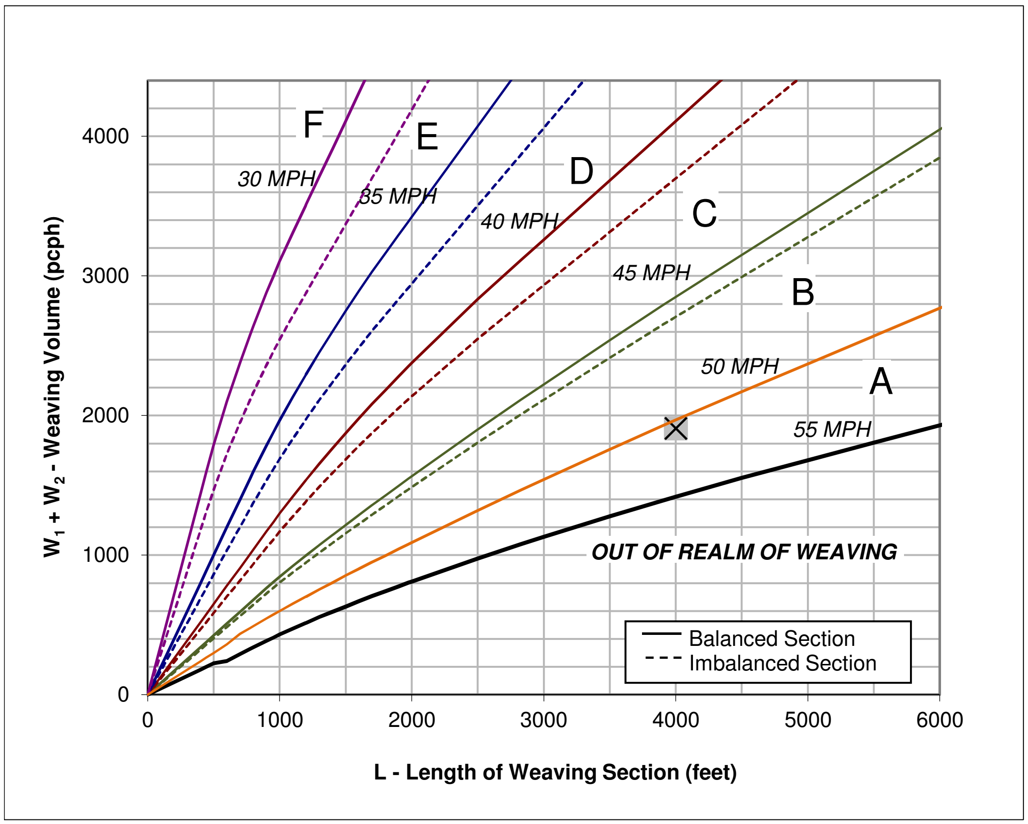
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,000 |

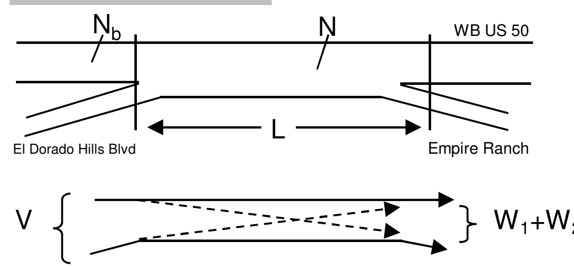
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | WB US 50 |
| On-ramp | El Dorado Hills Blvd |
| Off-ramp | Empire Ranch |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,190 | Volume (vph)* | 1,140 | Volume (vph)* | 750 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,316 | Volume (pcph) | 1,151 | Volume (pcph) | 758 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **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.
3. Interpolated Weaving Speed ($S_w$, mph) 50.6
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 863
6. Level of Service (LOS) B

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

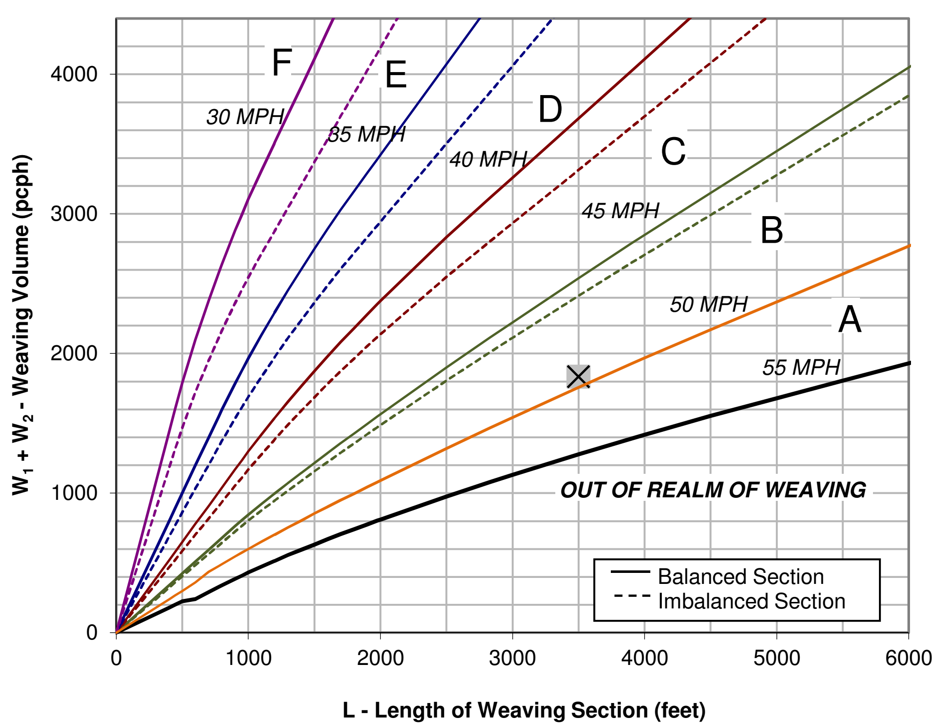
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

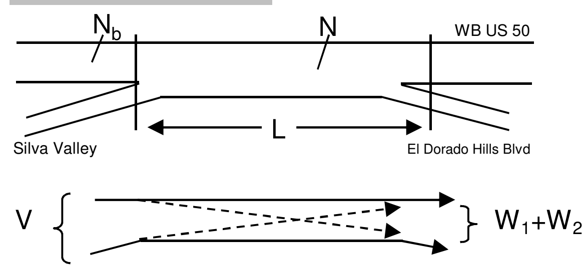
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | WB US 50 |
| On-ramp | Silva Valley |
| Off-ramp | El Dorado Hills Blvd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,450 | Volume (vph)* | 866 | Volume (vph)* | 950 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,614 | Volume (pcph) | 875 | Volume (pcph) | 960 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**

   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) 49.5
4. Weaving Intensity Factor (k) 1.27
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,169
6. Level of Service (LOS) B

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

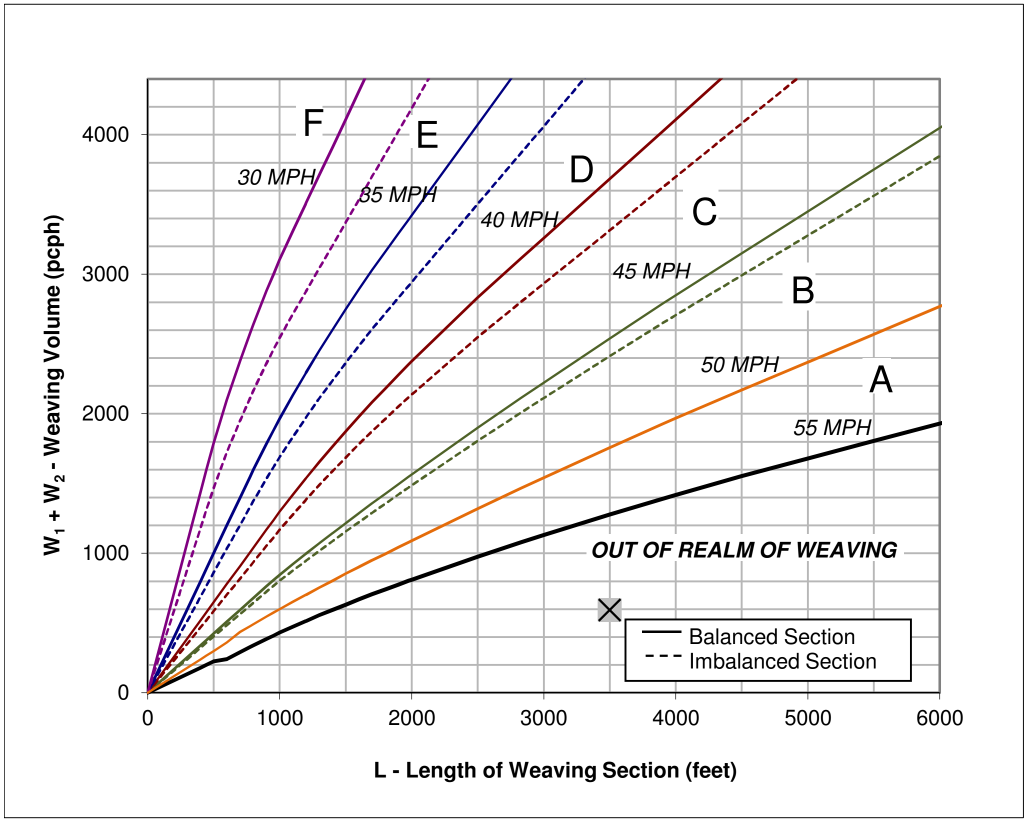
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

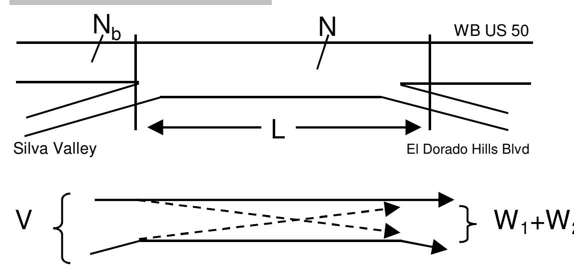
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | WB US 50 |
| On-ramp | Silva Valley |
| Off-ramp | El Dorado Hills Blvd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,440 | Volume (vph)* | 199 | Volume (vph)* | 390 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 3,543 | Volume (pcph) | 201 | Volume (pcph) | 394 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **MPH** and **MPH**

   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) 52.3
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   SV = (1/N)*[V + (k - 1)*min($W_1$, $W_2$)] 709
6. Level of Service (LOS) A

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

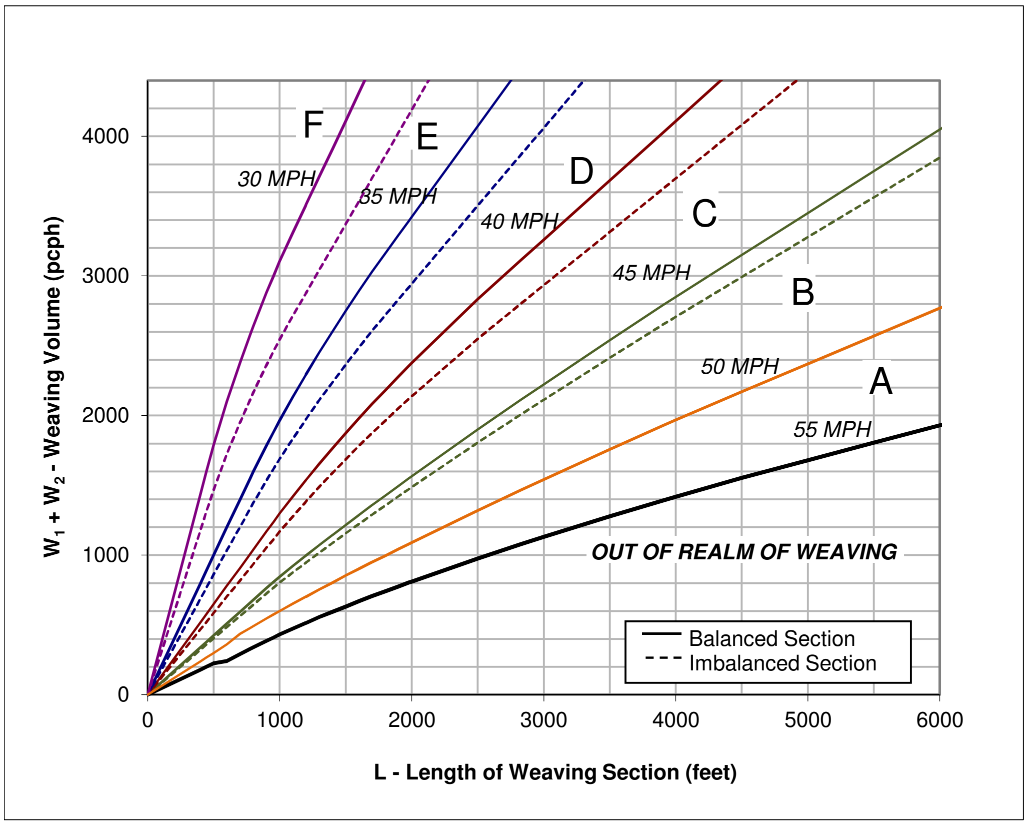
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 10,500 |

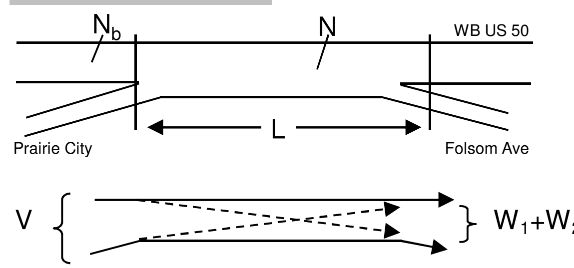
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - AM |
| Freeway | WB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Folsom Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,340 | Volume (vph)* | 310 | Volume (vph)* | 382 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,500 | Volume (pcph) | 313 | Volume (pcph) | 386 |




## 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?
   **MPH** and **MPH**
   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) 51.1
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,375
6. 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

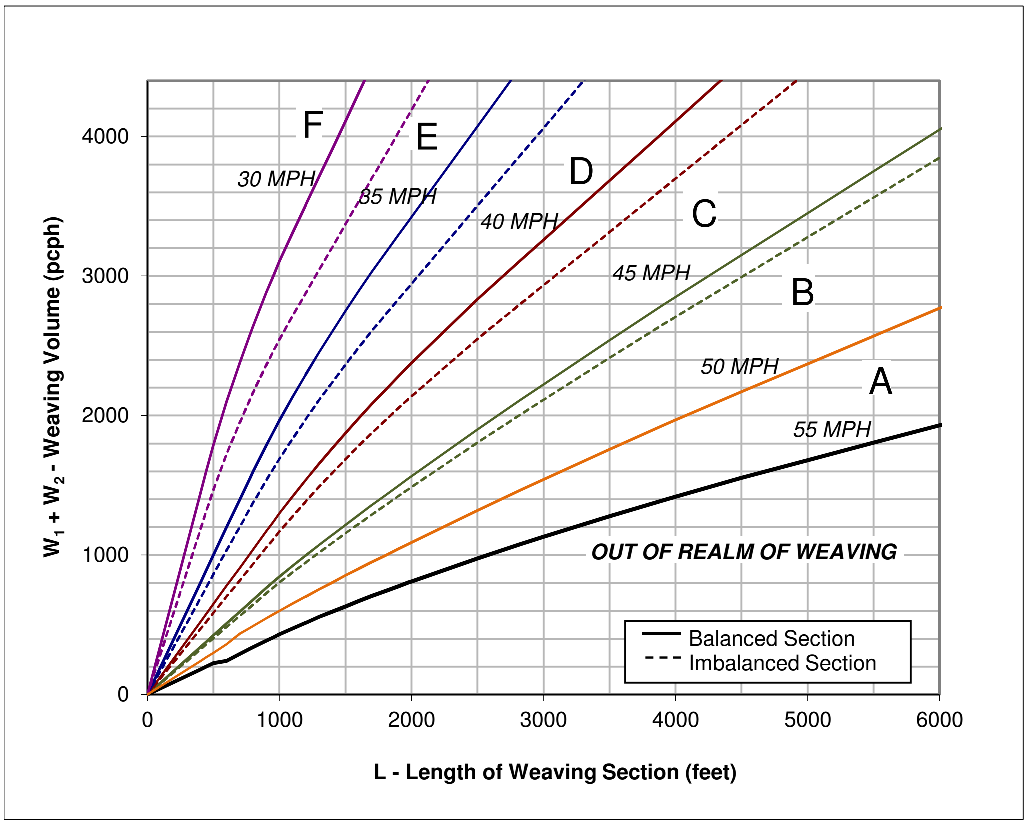
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 10,500 |

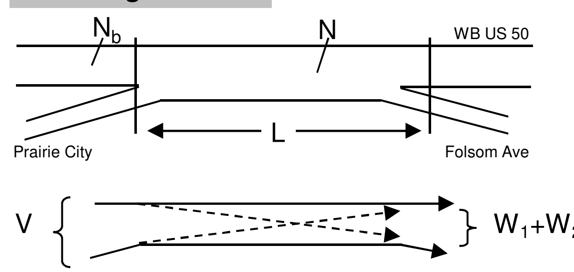
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative No Project - PM |
| Freeway | WB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Folsom Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,210 | Volume (vph)* | 470 | Volume (vph)* | 263 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,366 | Volume (pcph) | 475 | Volume (pcph) | 266 |




## 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?

   **MPH** and **MPH**

   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) 51.2
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,342
6. Level of Service (LOS) C

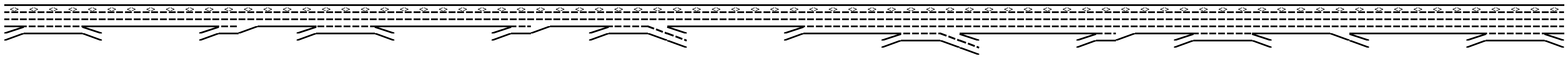
The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* 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

# Cumulative Plus Project Conditions

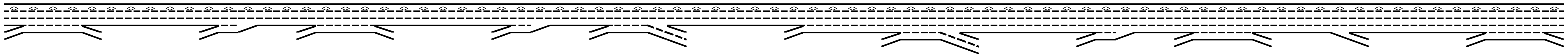
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Basic | Weave | Basic | Merge | Weave | Diverge | Basic | Weave |
| Length (ft) | 11,700 | 1,700 | 1,000 | 1,200 | 1,650 | 780 | 5,000 | 1,850 | 1,360 | 3,500 | 1,850 | 1,360 | 4,200 | 330 | 1,500 | 3,150 |
| Accel Length | | | 300 | | | 300 | | | | | | 300 | | | | |
| Decel Length | | | | | | | | | | | | | | 150 | | |
| Mainline Volume | 5,014 | 5,030 | 5,030 | 5,090 | 4,470 | 4,470 | 4,610 | 3,330 | 3,330 | 3,450 | 3,210 | 3,210 | 3,590 | 3,170 | 2,940 | 2,940 |
| On Ramp Volume | 306 | | 60 | 290 | | 140 | 140 | | 120 | 470 | | 380 | 170 | | | 470 |
| Off Ramp Volume | 290 | | | 910 | | | 1,420 | | | 710 | | | 590 | 230 | | 322 |
| Express Lane Volume | 652 | 654 | 654 | 662 | 581 | 581 | 599 | 433 | 433 | 449 | 417 | 417 | 467 | 412 | 382 | 382 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 4,668 | 4,376 | 4,436 | 4,718 | 3,889 | 4,029 | 4,151 | 2,897 | 3,017 | 3,472 | 2,793 | 3,173 | 3,293 | 2,758 | 2,558 | 3,028 |
| PHF | 0.92 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| GP Lanes | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 4 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Grade | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 3.2% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 5,226 | 4,695 | 4,760 | 4,959 | 4,087 | 4,234 | 4,362 | 3,108 | 3,237 | 3,833 | 3,127 | 3,552 | 3,687 | 3,088 | 2,864 | 3,489 |
| GP Flow (pcphpl) | 1,742 | 2,348 | 2,380 | 1,653 | 2,044 | 2,117 | 1,454 | 1,554 | 1,079 | 958 | 1,042 | 1,184 | 922 | 1,029 | 955 | 872 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | | | | | |
| Shoulder Width | | | | | | | | | | | | | | | | |
| TRD | | | | | | | | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | | | | | | | | |
| Calculated FFS | | | | | | | | | | | | | | | | |
| Measured FFS | | | | | | | | | | | | | | | | |
| FFS Curve | 65 | 65 | 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 | 1.00 | 1.01 | 0.70 | 0.87 | 0.90 | 0.62 | 0.66 | 0.46 | 0.41 | 0.44 | 0.50 | 0.39 | 0.44 | 0.41 | 0.37 |
| Speed (mph) | 63.3 | 52.3 | - | 64.1 | 59.1 | 57.7 | 65.0 | 64.7 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 |
| Density (pcphpl) | 27.5 | 44.9 | - | 25.8 | 34.6 | 36.7 | 22.4 | 24.0 | 16.6 | 14.7 | 16.0 | 18.2 | 14.2 | 15.8 | 14.7 | 13.4 |
| LOS | D | E | F | C | D | E | C | C | B | B | B | C | B | B | B | B |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 4,890 | | 4,694 | 4,654 | | 4,081 | 4,209 | | 3,105 | 3,317 | | 3,135 | 3,500 | 3,088 | | 2,978 |
| $GP_{IN}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | 4,700 | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{IN}$ v/c ratio | 1.04 | | 1.00 | 0.99 | | 0.87 | 0.90 | | 0.66 | 0.47 | | 0.44 | 0.50 | 0.44 | | 0.42 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 4,908 | | 4,760 | 3,960 | | 4,234 | 2,804 | | | 3,054 | | 3,552 | 3,066 | 2,846 | | 3,135 |
| $GP_{OUT}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{OUT}$ v/c ratio | 1.04 | | 1.01 | 0.84 | | 0.90 | 0.60 | | | 0.43 | | 0.50 | 0.43 | 0.40 | | 0.44 |

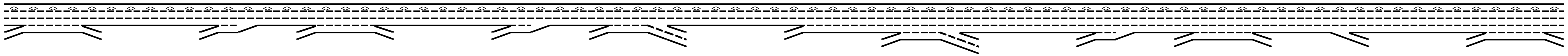
| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 652 | 654 | 654 | 662 | 581 | 581 | 599 | 433 | 433 | 449 | 417 | 417 | 467 | 412 | 382 | 382 |
| PHF | 0.92 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.96 | 0.96 | 0.96 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Grade | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 3.2% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| 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% | 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.5 |
| $E_R$ | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 3.0 |
| $f_{HV}$ | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.971 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 716 | 688 | 688 | 682 | 599 | 599 | 618 | 455 | 455 | 481 | 458 | 458 | 512 | 452 | 420 | 428 |
| EL Flow (pcphpl) | 716 | 688 | 688 | 682 | 599 | 599 | 618 | 455 | 455 | 481 | 458 | 458 | 512 | 452 | 420 | 428 |
| ***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 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.41 | 0.39 | 0.39 | 0.39 | 0.34 | 0.34 | 0.35 | 0.26 | 0.26 | 0.27 | 0.26 | 0.26 | 0.29 | 0.26 | 0.24 | 0.24 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | 306 | | 60 | 290 | | 140 | 140 | | 120 | 470 | | 380 | 170 | | | 470 |
| PHF | 0.92 | | 0.92 | 0.96 | | 0.92 | 0.92 | | 0.92 | 0.92 | | 0.92 | 0.92 | | | 0.93 |
| Total Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | | 1 |
| Terrain | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level | | | Level |
| Grade % | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | | 2.0% |
| 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 |
| $f_{HV}$ | 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 |
| On Flow (pcph) | 336 | | 66 | 305 | | 154 | 154 | | 132 | 516 | | 417 | 187 | | | 510 |
| On Flow (pcphpl) | 336 | | 66 | 305 | | 154 | 154 | | 132 | 516 | | 417 | 187 | | | 510 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right | | | Right |
| On Ramp Speed (mph) | 35 | | 35 | 45 | | 35 | 45 | | 25 | 45 | | 25 | 45 | | | 35 |
| On Ramp Cap (pcph) | 2,000 | | 2,000 | 2,100 | | 2,000 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | | 2,000 |
| On Ramp v/c ratio | 0.17 | | 0.03 | 0.15 | | 0.08 | 0.07 | | 0.07 | 0.25 | | 0.22 | 0.09 | | | 0.26 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

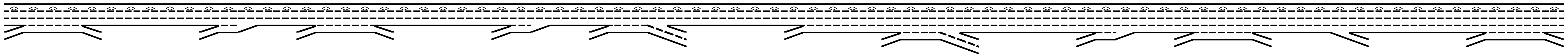


**Key**

<> Express Lane (HOV)

No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | 290 | | | 910 | | | 1,420 | | | 710 | | | 590 | 230 | | 322 |
| PHF | 0.92 | | | 0.92 | | | 0.92 | | | 0.92 | | | 0.96 | 0.96 | | 0.92 |
| Total Lanes | 1 | | | 1 | | | 2 | | | 2 | | | 1 | 1 | | 1 |
| Terrain | Level | | | Level | | | Grade | | | Level | | | Level | Level | | Level |
| Grade % | 2.0% | | | 2.0% | | | 3.4% | | | 2.0% | | | 2.0% | 2.0% | | 0.0% |
| Grade Length (mi) | 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% |
| RV % | 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 |
| $E_R$ | 1.2 | | | 1.2 | | | 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 |
| $f_P$ | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | 1.00 | | 1.00 |
| Off Flow (pcph) | 318 | | | 999 | | | 1,559 | | | 779 | | | 621 | 242 | | 354 |
| Off Flow (pcphpl) | 318 | | | 999 | | | 779 | | | 390 | | | 621 | 242 | | 354 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | | Right | | | Right | | | Right | | | Right | Right | | Right |
| Off Ramp Speed | 35 | | | 40 | | | 40 | | | 40 | | | 35 | 25 | | 40 |
| Off Ramp Cap (pcph) | 2,000 | | | 2,000 | | | 4,000 | | | 4,000 | | | 2,000 | 1,900 | | 2,000 |
| Off Ramp v/c ratio | 0.16 | | | 0.50 | | | 0.39 | | | 0.19 | | | 0.31 | 0.13 | | 0.18 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | No | | Off | | |
| Up Distance | | | | | | | | | | | | | | 4,530 | | |
| Up Flow (pcph) | | | | | | | | | | | | | | 621 | | |
| Down Type | | | | | | | | | | | | On | | On | | |
| Down Distance | | | | | | | | | | | | 1,360 | | 1,500 | | |
| Down Flow (pcph) | | | | | | | | | | | | 187 | | 510 | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | 4,694 | | | 4,081 | | | | | | 3,135 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | 1,317 | | | | |
| $P_{FM}$ (Eqn 13-3) | | | 0.586 | | | 0.586 | | | | | | 0.586 | | | | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | 1.000 | | | 1.000 | | | | | | 0.586 | | | | |
| $v_{12}$ (pcph) | | | 4,694 | | | 4,081 | | | | | | 1,837 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | 1,298 | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | 4,694 | | | 4,081 | | | | | | 1,837 | | | | |
| $v_{R12a}$ (pcph) | | | 4,760 | | | 4,234 | | | | | | 2,254 | | | | |
| Merge Speed Index | | | - | | | 0.57 | | | | | | 0.34 | | | | |
| Merge Area Speed | | | - | | | 51.9 | | | | | | 57.1 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | 1,298 | | | | |
| Outer Lanes Speed | | | | | | | | | | | | 62.1 | | | | |
| Segment Speed | | | | | | 51.9 | | | | | | 58.8 | | | | |
| Merge v/c ratio | | | 1.03 | | | 0.92 | | | | | | 0.49 | | | | |
| Merge Density | | | - | | | 36.6 | | | | | | 21.0 | | | | |
| Merge LOS | | | F | | | E | | | | | | C | | | | |

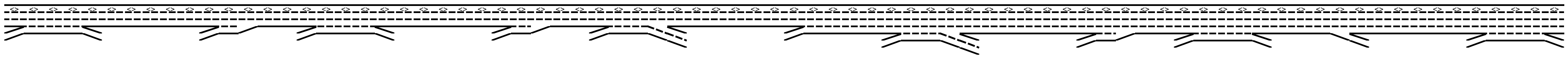


**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | 3,088 | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | 5,021 | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | 531 | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | 0.672 | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | 0.672 | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | 2,153 | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | 934 | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | 2,153 | | |
| Diverge Speed Index | | | | | | | | | | | | | | 0.58 | | |
| Diverge Area Speed | | | | | | | | | | | | | | 51.7 | | |
| Outer Lanes Volume | | | | | | | | | | | | | | 934 | | |
| Outer Lanes Speed | | | | | | | | | | | | | | 71.3 | | |
| Segment Speed | | | | | | | | | | | | | | 56.4 | | |
| Diverge v/c ratio | | | | | | | | | | | | | | 0.49 | | |
| Diverge Density | | | | | | | | | | | | | | 21.4 | | |
| Diverge LOS | | | | | | | | | | | | | | C | | |



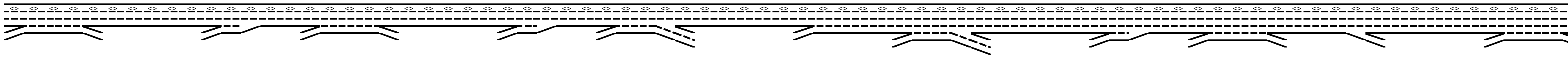
**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Summarize Segment Operations** | | | | | | | | | | | | | | | | |
| Segment v/c ratio | 0.74 | 1.00 | 1.03 | #VALUE! | 0.87 | 0.92 | 0.62 | 0.66 | 0.46 | 0.41 | 0.44 | 0.49 | 0.39 | 0.49 | 0.41 | 0.37 |
| Segment Density | 27.5 | 44.9 | - | #VALUE! | 34.6 | 36.6 | 22.4 | 24.0 | 16.6 | 14.7 | 16.0 | 21.0 | 14.2 | 21.4 | 14.7 | 13.4 |
| Segment LOS | D | E | F | #VALUE! | D | E | C | C | B | B | B | C | B | C | B | B |
| Over Capacity | | | Segment GP Lanes Out GP Lanes Merge | #VALUE! | | | | | | | | | | | | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



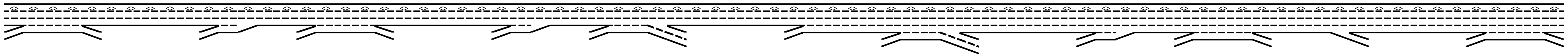
**Key**
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Basic | Weave | Basic | Merge | Weave | Diverge | Basic | Weave |
| Length (ft) | 11,700 | 1,700 | 1,000 | 1,200 | 1,650 | 780 | 5,000 | 1,850 | 1,360 | 3,500 | 1,850 | 1,360 | 4,200 | 330 | 1,500 | 3,150 |
| Accel Length | | | 300 | | | 300 | | | | | | 300 | | | | |
| Decel Length | | | | | | | | | | | | | | 150 | | |
| Mainline Volume | 6,208 | 5,650 | 5,650 | 5,800 | 5,110 | 5,110 | 5,270 | 4,150 | 4,150 | 4,990 | 4,840 | 4,840 | 5,410 | 5,000 | 4,420 | 4,420 |
| On Ramp Volume | 382 | | 150 | 620 | | 160 | 320 | | 840 | 880 | | 570 | 150 | | | 860 |
| Off Ramp Volume | 940 | | | 1,310 | | | 1,440 | | | 1,030 | | | 560 | 580 | | 799 |
| Express Lane Volume | 1,242 | 1,130 | 1,130 | 1,160 | 1,022 | 1,022 | 1,054 | 830 | 830 | 998 | 968 | 968 | 1,082 | 1,000 | 884 | 884 |
| EL On Ramp Volume | | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | | |
| | 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 | 0.2 | 0.2 | 0.2 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | | |
| GP Volume (vph) | 5,348 | 4,520 | 4,670 | 5,260 | 4,088 | 4,248 | 4,536 | 3,320 | 4,160 | 4,872 | 3,872 | 4,442 | 4,478 | 4,000 | 3,536 | 4,396 |
| PHF | 0.99 | 0.99 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| GP Lanes | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 4 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 6.4% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 4.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 |
| $E_R$ | 1.2 | 1.2 | 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 | 3.0 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.847 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.943 |
| $f_P$ | 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 | 1.00 | 1.00 |
| GP Flow (pcph) | 5,564 | 4,703 | 5,011 | 5,644 | 4,386 | 4,558 | 4,867 | 3,489 | 4,372 | 5,866 | 4,070 | 4,669 | 4,706 | 4,204 | 3,716 | 4,755 |
| GP Flow (pcphpl) | 1,855 | 2,351 | 2,505 | 1,881 | 2,193 | 2,279 | 1,622 | 1,745 | 1,457 | 1,467 | 1,357 | 1,556 | 1,177 | 1,401 | 1,239 | 1,189 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | | | | | |
| Shoulder Width | | | | | | | | | | | | | | | | |
| TRD | | | | | | | | | | | | | | | | |
| $f_{LW}$ | | | | | | | | | | | | | | | | |
| $f_{LC}$ | | | | | | | | | | | | | | | | |
| Calculated FFS | | | | | | | | | | | | | | | | |
| Measured FFS | | | | | | | | | | | | | | | | |
| FFS Curve | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | | |
| v/c ratio | 0.79 | 1.00 | 1.07 | 0.80 | 0.93 | 0.97 | 0.69 | 0.74 | 0.62 | 0.62 | 0.58 | 0.66 | 0.50 | 0.60 | 0.53 | 0.51 |
| Speed (mph) | 62.1 | - | - | 61.7 | 56.1 | 54.0 | 64.3 | 63.3 | 65.0 | 64.9 | 65.0 | 64.7 | 65.0 | 65.0 | 65.0 | 65.0 |
| Density (pcphpl) | 29.9 | - | - | 30.5 | 39.1 | 42.2 | 25.2 | 27.6 | 22.4 | 22.6 | 20.9 | 24.1 | 18.1 | 21.6 | 19.1 | 18.3 |
| LOS | D | F | F | D | E | E | C | D | C | C | C | C | C | C | C | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 5,163 | | 4,853 | 4,991 | | 4,382 | 4,515 | | 3,515 | 4,969 | | 4,043 | 4,542 | 4,204 | | 3,869 |
| $GP_{IN}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | 4,700 | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{IN}$ v/c ratio | 1.10 | | 1.03 | 1.06 | | 0.93 | 0.96 | | 0.75 | 0.70 | | 0.57 | 0.64 | 0.60 | | 0.55 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 4,571 | | 5,011 | 4,258 | | 4,558 | 3,390 | | | 4,730 | | 4,669 | 4,126 | 3,603 | | 3,873 |
| $GP_{OUT}$ Cap (pcph) | 4,700 | | 4,700 | 4,700 | | 4,700 | 4,700 | | | 7,050 | | 7,050 | 7,050 | 7,050 | | 7,050 |
| $GP_{OUT}$ v/c ratio | 0.97 | | 1.07 | 0.91 | | 0.97 | 0.72 | | | 0.67 | | 0.66 | 0.59 | 0.51 | | 0.55 |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Cumulative Plus Project Conditions
Time Period: PM Peak Hour

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



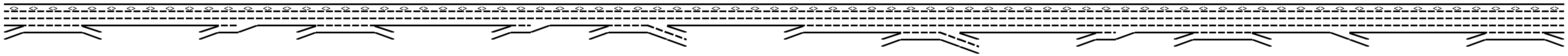
**Key**

<> Express Lane (HOV)

No Trucks

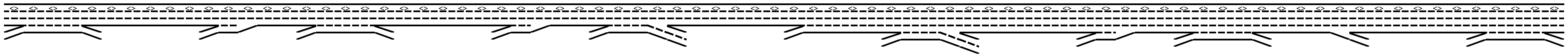
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | | |
| EL Volume (vph) | 1,242 | 1,130 | 1,130 | 1,160 | 1,022 | 1,022 | 1,054 | 830 | 830 | 998 | 968 | 968 | 1,082 | 1,000 | 884 | 884 |
| PHF | 0.96 | 0.96 | 0.96 | 0.98 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.92 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Grade | Grade | Level | Grade | Level | Grade | Grade | Grade | Level | Level | Level | Grade |
| Grade % | 1.0% | 0.6% | 0.6% | 0.0% | 2.0% | 2.0% | 1.0% | 2.9% | 1.5% | 6.4% | -4.3% | 2.2% | 0.3% | 0.0% | -1.5% | 3.4% |
| Grade Length (mi) | 2.22 | 0.32 | 0.19 | 0.23 | 0.31 | 0.15 | 0.95 | 0.35 | 0.26 | 0.66 | 0.35 | 0.26 | 0.80 | 0.06 | 0.28 | 0.60 |
| 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% | 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% | 0.0% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 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 | 2.5 |
| $E_R$ | 1.2 | 1.2 | 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 | 3.0 |
| $f_{HV}$ | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.926 | 0.990 | 0.990 | 0.990 | 0.990 | 0.990 | 0.971 |
| $f_P$ | 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 | 1.00 | 1.00 |
| EL Flow (pcph) | 1,306 | 1,189 | 1,189 | 1,196 | 1,075 | 1,075 | 1,109 | 873 | 873 | 1,123 | 1,018 | 1,018 | 1,138 | 1,052 | 930 | 990 |
| EL Flow (pcphpl) | 1,306 | 1,189 | 1,189 | 1,196 | 1,075 | 1,075 | 1,109 | 873 | 873 | 1,123 | 1,018 | 1,018 | 1,138 | 1,052 | 930 | 990 |
| ***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 | 65.0 | 65.0 |
| FFS | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.75 | 0.68 | 0.68 | 0.68 | 0.61 | 0.61 | 0.63 | 0.50 | 0.50 | 0.64 | 0.58 | 0.58 | 0.65 | 0.60 | 0.53 | 0.57 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| On Volume (vph) | 382 | | 150 | 620 | | 160 | 320 | | 840 | 880 | | 570 | 150 | | | 860 |
| PHF | 0.96 | | 0.96 | 0.96 | | 0.92 | 0.92 | | 0.99 | 0.99 | | 0.92 | 0.92 | | | 0.98 |
| Total Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | | 1 |
| Terrain | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level | | | Level |
| Grade % | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | | 2.0% |
| 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 |
| $f_{HV}$ | 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 |
| On Flow (pcph) | 402 | | 158 | 652 | | 176 | 351 | | 857 | 898 | | 626 | 165 | | | 886 |
| On Flow (pcphpl) | 402 | | 158 | 652 | | 176 | 351 | | 857 | 898 | | 626 | 165 | | | 886 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right | | | Right |
| On Ramp Speed (mph) | 45 | | 35 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | | 35 |
| On Ramp Cap (pcph) | 2,100 | | 2,000 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | | 2,000 |
| On Ramp v/c ratio | 0.19 | | 0.08 | 0.31 | | 0.09 | 0.17 | | 0.45 | 0.43 | | 0.33 | 0.08 | | | 0.44 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**
<> Express Lane (HOV)
No Trucks

| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | | |
| Off Volume (vph) | 940 | | | 1,310 | | | 1,440 | | | 1,030 | | | 560 | 580 | | 799 |
| PHF | 0.96 | | | 0.96 | | | 0.99 | | | 0.92 | | | 0.98 | 0.98 | | 0.92 |
| Total Lanes | 1 | | | 1 | | | 2 | | | 2 | | | 1 | 1 | | 1 |
| Terrain | Level | | | Level | | | Level | | | Level | | | Level | Level | | Level |
| Grade % | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | 2.0% | | 2.0% |
| Grade Length (mi) | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | 0.00 | | 0.00 |
| Truck & Bus % | 3.0% | | | 3.0% | | | 3.0% | | | 3.0% | | | 3.0% | 3.0% | | 3.0% |
| RV % | 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 |
| $E_R$ | 1.2 | | | 1.2 | | | 1.2 | | | 1.2 | | | 1.2 | 1.2 | | 1.2 |
| $f_{HV}$ | 0.985 | | | 0.985 | | | 0.985 | | | 0.985 | | | 0.985 | 0.985 | | 0.985 |
| $f_P$ | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 |
| Off Flow (pcph) | 994 | | | 1,385 | | | 1,476 | | | 1,136 | | | 580 | 601 | | 882 |
| Off Flow (pcphpl) | 994 | | | 1,385 | | | 738 | | | 568 | | | 580 | 601 | | 882 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | | Right | | | Right | | | Right | | | Right | Right | | Right |
| Off Ramp Speed | 35 | | | 40 | | | 40 | | | 40 | | | 35 | 25 | | 40 |
| Off Ramp Cap (pcph) | 2,000 | | | 2,000 | | | 4,000 | | | 4,000 | | | 2,000 | 1,900 | | 2,000 |
| Off Ramp v/c ratio | 0.50 | | | 0.69 | | | 0.37 | | | 0.28 | | | 0.29 | 0.32 | | 0.44 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane Ramps** | | | | | | | | | | | | | | | | |
| Up Type | | | | | | | | | | | | No | | Off | | |
| Up Distance | | | | | | | | | | | | | | 4,530 | | |
| Up Flow (pcph) | | | | | | | | | | | | | | 580 | | |
| Down Type | | | | | | | | | | | | On | | On | | |
| Down Distance | | | | | | | | | | | | 1,360 | | 1,500 | | |
| Down Flow (pcph) | | | | | | | | | | | | 165 | | 886 | | |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | 4,853 | | | 4,382 | | | | | | 4,043 | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | 1,162 | | | | |
| $P_{FM}$ (Eqn 13-3) | | | 0.586 | | | 0.586 | | | | | | 0.586 | | | | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | 1.000 | | | 1.000 | | | | | | 0.586 | | | | |
| $v_{12}$ (pcph) | | | 4,853 | | | 4,382 | | | | | | 2,369 | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | 1,674 | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | 4,853 | | | 4,382 | | | | | | 2,369 | | | | |
| $v_{R12a}$ (pcph) | | | 5,011 | | | 4,558 | | | | | | 2,994 | | | | |
| Merge Speed Index | | | - | | | 0.68 | | | | | | 0.38 | | | | |
| Merge Area Speed | | | - | | | 49.4 | | | | | | 56.2 | | | | |
| Outer Lanes Volume | | | | | | | | | | | | 1,674 | | | | |
| Outer Lanes Speed | | | | | | | | | | | | 60.8 | | | | |
| Segment Speed | | | | | | 49.4 | | | | | | 57.7 | | | | |
| Merge v/c ratio | | | 1.09 | | | 0.99 | | | | | | 0.65 | | | | |
| Merge Density | | | - | | | 39.1 | | | | | | 26.7 | | | | |
| Merge LOS | | | F | | | E | | | | | | C | | | | |



**Key**

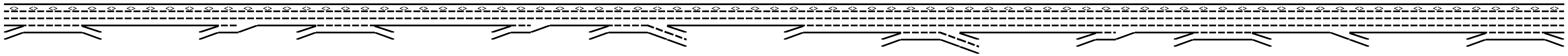
<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | 4,204 | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | 4,753 | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | 1,117 | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | 0.627 | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | 0.627 | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | 2,861 | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | 1,343 | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | 2,861 | | |
| Diverge Speed Index | | | | | | | | | | | | | | 0.61 | | |
| Diverge Area Speed | | | | | | | | | | | | | | 50.9 | | |
| Outer Lanes Volume | | | | | | | | | | | | | | 1,343 | | |
| Outer Lanes Speed | | | | | | | | | | | | | | 70.0 | | |
| Segment Speed | | | | | | | | | | | | | | 55.8 | | |
| Diverge v/c ratio | | | | | | | | | | | | | | 0.65 | | |
| Diverge Density | | | | | | | | | | | | | | 27.5 | | |
| Diverge LOS | | | | | | | | | | | | | | C | | |

Project: Russell Ranch
Freeway Corridor: Eastbound US 50

Alternative: Cumulative Plus Project Conditions
Time Period: PM Peak Hour



**Key**

<> Express Lane (HOV)

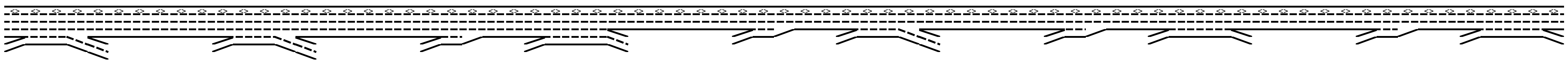
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Name | Folsom to Prairie City Weave | Between Prairie City Ramps | Prairie City On Ramp | Prairie City/Oak Ave Weave | Between Oak Avenue Ramps | Oak Avenue Loop On Ramp | Oak Avenue to Scott Rd Weave | Between Scott Rd Ramps |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.79 | 1.00 | 1.09 | #VALUE! | 0.93 | 0.99 | 0.69 | 0.74 |
| Segment Density | 29.9 | - | - | #VALUE! | 39.1 | 39.1 | 25.2 | 27.6 |
| Segment LOS | D | F | F | #VALUE! | E | E | C | D |
| Over Capacity | | Segment GP Lanes | Segment GP Lanes In GP Lanes Out GP Lanes Merge | #VALUE! | | | | |

| Location | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Name | Scott Rd On Ramp | Scott Rd On Ramp II to Empire Ranch | Between Ramps | Empire Ranch Loop On Ramp | Empire Ranch to Latrobe Weave | Latrobe Rd Off Ramp II | Between Ramps | Latrobe to White Rock Weave |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.62 | #VALUE! | 0.58 | 0.65 | 0.50 | 0.65 | 0.53 | 0.51 |
| Segment Density | 22.4 | #VALUE! | 20.9 | 26.7 | 18.1 | 27.5 | 19.1 | 18.3 |
| Segment LOS | C | #VALUE! | C | C | C | C | C | C |
| Over Capacity | | #VALUE! | | | #VALUE! | | | #VALUE! |

**Project:** **Russell Ranch**
**Freeway Corridor:** **Westbound US 50**

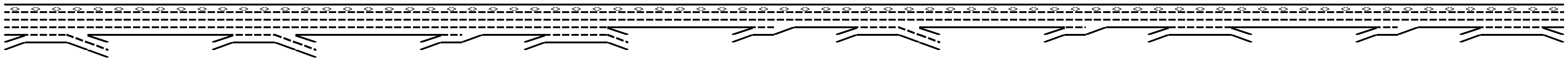
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| hide | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 2 0 0 | 0 1 2 0 0 | 0 1 2 0 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 |
| hide | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 1 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 |
| hide | 1 1 14 2 1 | 0 0 14 0 0 | 1 1 14 2 1 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 2 2 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 2 1 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 1 1 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 1 1 |
| hide | | | | | | | 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 | 0 0 0 0 | 0 0 0 0 |
| **Location** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |



**Key**
<> Express Lane (HOV)
No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave |
| Length (ft) | 3,500 | 2,500 | 4,000 | 1,650 | 780 | 3,500 | 1,650 | 780 | 5,000 | 1,650 | 780 | 2,000 | 1,400 | 1,250 | 10,500 |
| Accel Length | | | | | 300 | | | 300 | | | 300 | | | 300 | |
| Decel Length | | | | | | | | | | | | | | | |
| Mainline Volume | 4,530 | 4,510 | 4,510 | 3,980 | 3,980 | 4,320 | 3,650 | 3,650 | 3,910 | 4,060 | 4,060 | 4,390 | 4,830 | 4,830 | 5,000 |
| On Ramp Volume | 930 | | 930 | | 340 | 190 | | 260 | 780 | | 330 | 1,100 | | 170 | 300 |
| Off Ramp Volume | 950 | | 1,460 | | | 860 | | | 630 | | | 660 | | | 375 |
| Express Lane Volume | 906 | 902 | 902 | 796 | 796 | 864 | 730 | 730 | 782 | 812 | 812 | 878 | 966 | 966 | 1,000 |
| EL On Ramp Volume | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | |
| | 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 | 0.2 | 0.2 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | |
| GP Volume (vph) | 4,554 | 3,608 | 4,538 | 3,184 | 3,524 | 3,646 | 2,920 | 3,180 | 3,908 | 3,248 | 3,578 | 4,612 | 3,864 | 4,034 | 4,300 |
| PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.99 |
| GP Lanes | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |
| Terrain | Grade | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Grade | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -3.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 4.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.943 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 |
| GP Flow (pcph) | 5,099 | 4,039 | 5,081 | 3,669 | 3,945 | 4,082 | 3,133 | 3,412 | 4,193 | 3,485 | 3,839 | 4,948 | 4,061 | 4,240 | 4,474 |
| GP Flow (pcphpl) | 1,275 | 1,346 | 1,270 | 1,223 | 1,315 | 1,020 | 1,566 | 1,706 | 1,398 | 1,742 | 1,919 | 1,649 | 2,031 | 2,120 | 1,491 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calculated FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS Curve | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | |
| v/c ratio | 0.53 | 0.56 | 0.53 | 0.51 | 0.55 | 0.43 | 0.65 | 0.71 | 0.58 | 0.73 | 0.80 | 0.69 | 0.85 | 0.88 | 0.62 |
| Speed (mph) | 69.9 | 69.8 | 69.9 | 70.0 | 69.8 | 70.0 | 68.4 | 67.0 | 69.5 | 66.6 | 64.0 | 67.7 | 62.0 | 60.2 | 69.0 |
| Density (pcphpl) | 18.2 | 19.3 | 18.2 | 17.5 | 18.8 | 14.6 | 22.9 | 25.5 | 20.1 | 26.2 | 30.0 | 24.4 | 32.8 | 35.2 | 21.6 |
| LOS | C | C | C | B | C | B | C | C | C | D | D | C | D | E | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 4,120 | | 4,102 | | 3,572 | 3,873 | | 3,138 | 3,368 | | 3,477 | 3,741 | | 4,053 | 4,158 |
| $GP_{IN}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 7,200 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{IN}$ v/c ratio | 0.57 | | 0.57 | | 0.50 | 0.54 | | 0.65 | 0.70 | | 0.72 | 0.78 | | 0.84 | 0.87 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 4,099 | | 3,478 | | 3,945 | 3,177 | | 3,412 | 3,501 | | 3,839 | 4,224 | | 4,240 | 4,062 |
| $GP_{OUT}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{OUT}$ v/c ratio | 0.57 | | 0.48 | | 0.55 | 0.66 | | 0.71 | 0.73 | | 0.80 | 0.88 | | 0.88 | 0.85 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



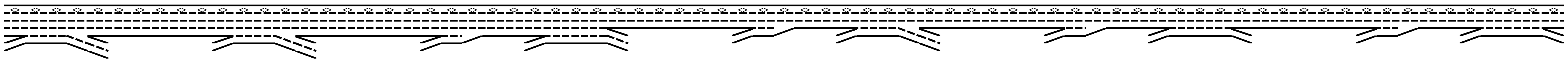
**Key**

<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | |
| EL Volume (vph) | 906 | 902 | 902 | 796 | 796 | 864 | 730 | 730 | 782 | 812 | 812 | 878 | 966 | 966 | 1,000 |
| PHF | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -3.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| 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% | 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% | 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 | 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 | 1.2 |
| $f_{HV}$ | 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 | 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 | 1.00 |
| EL Flow (pcph) | 995 | 990 | 949 | 837 | 837 | 909 | 768 | 768 | 823 | 854 | 854 | 924 | 996 | 996 | 1,031 |
| EL Flow (pcphpl) | 995 | 990 | 949 | 837 | 837 | 909 | 768 | 768 | 823 | 854 | 854 | 924 | 996 | 996 | 1,031 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calc'd FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.57 | 0.57 | 0.54 | 0.48 | 0.48 | 0.52 | 0.44 | 0.44 | 0.47 | 0.49 | 0.49 | 0.53 | 0.57 | 0.57 | 0.59 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | |
| On Volume (vph) | 930 | | 930 | | 340 | 190 | | 260 | 780 | | 330 | 1,100 | | 170 | 300 |
| PHF | 0.96 | | 0.96 | | 0.92 | 0.92 | | 0.96 | 0.96 | | 0.92 | 0.92 | | 0.92 | 0.96 |
| Total Lanes | 1 | | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 |
| Terrain | Level | | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level |
| Grade % | 2.0% | | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% |
| 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% | 3.0% | | 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 |
| $f_{HV}$ | 0.990 | | 0.990 | | 0.990 | 0.990 | | 0.990 | 0.985 | | 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 |
| On Flow (pcph) | 978 | | 978 | | 373 | 209 | | 274 | 825 | | 362 | 1,208 | | 187 | 316 |
| On Flow (pcphpl) | 978 | | 978 | | 373 | 209 | | 274 | 825 | | 362 | 1,208 | | 187 | 316 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right |
| On Ramp Speed (mph) | 35 | | 35 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 35 |
| On Ramp Cap (pcph) | 2,000 | | 2,000 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,000 |
| On Ramp v/c ratio | 0.49 | | 0.49 | | 0.20 | 0.10 | | 0.14 | 0.39 | | 0.19 | 0.58 | | 0.10 | 0.16 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

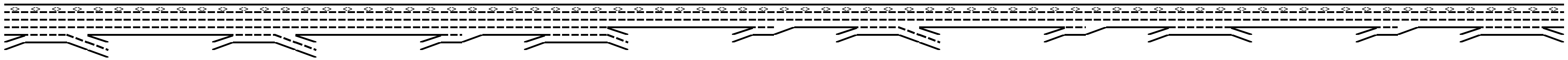


**Key**

<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | |
| Off Volume (vph) | 950 | | 1,460 | | | 860 | | | 630 | | | 660 | | | 375 |
| PHF | 0.96 | | 0.92 | | | 0.96 | | | 0.92 | | | 0.92 | | | 0.92 |
| Total Lanes | 2 | | 2 | | | 2 | | | 2 | | | 1 | | | 1 |
| Terrain | Level | | Level | | | Level | | | Level | | | Level | | | Level |
| Grade % | 2.0% | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% |
| Grade Length (mi) | 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% |
| 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 | | | 0.990 | | | 0.990 | | | 0.990 | | | 0.990 |
| $f_P$ | 1.00 | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 |
| Off Flow (pcph) | 999 | | 1,603 | | | 905 | | | 692 | | | 725 | | | 412 |
| Off Flow (pcphpl) | 500 | | 801 | | | 452 | | | 346 | | | 725 | | | 412 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | Right | | | Right | | | Right | | | Right | | | Right |
| Off Ramp Speed | 25 | | 40 | | | 40 | | | 40 | | | 40 | | | 40 |
| Off Ramp Cap (pcph) | 3,800 | | 4,000 | | | 4,000 | | | 4,000 | | | 2,000 | | | 2,000 |
| Off Ramp v/c ratio | 0.26 | | 0.40 | | | 0.23 | | | 0.17 | | | 0.36 | | | 0.21 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane** | | | | | | | | | | | | | | | |
| Up Type | | | | | No | | | | On | | | On | | | On |
| Up Distance | | | | | | | | | 780 | | | #REF! | | | #REF! |
| Up Flow (pcph) | | | | | | | | | 274 | | | 362 | | | 187 |
| Down Type | | | | | On | | | | On | | | On | | | #REF! |
| Down Distance | | | | | 780 | | | | 6,650 | | | 1,400 | | | #REF! |
| Down Flow (pcph) | | | | | 209 | | | | 1,208 | | | 316 | | | #REF! |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | 3,572 | | | 3,138 | | | 3,477 | | | 4,053 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | 1,472 | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | | 0.586 | | | 0.586 | | | 0.586 | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | | 0.586 | | | 1.000 | | | 1.000 | | | 1.000 | |
| $v_{12}$ (pcph) | | | | | 2,093 | | | 3,138 | | | 3,477 | | | 4,053 | |
| $v_3$ (pcph) | | | | | 1,479 | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | 2,093 | | | 3,138 | | | 3,477 | | | 4,053 | |
| $v_{R12a}$ (pcph) | | | | | 2,466 | | | 3,412 | | | 3,839 | | | 4,240 | |
| Merge Speed Index | | | | | 0.35 | | | 0.42 | | | 0.49 | | | 0.58 | |
| Merge Area Speed | | | | | 60.1 | | | 58.1 | | | 56.4 | | | 53.9 | |
| Outer Lanes Volume | | | | | 1,479 | | | | | | | | | | |
| Outer Lanes Speed | | | | | 66.5 | | | | | | | | | | |
| Segment Speed | | | | | 62.4 | | | 58.1 | | | 56.4 | | | 53.9 | |
| Merge v/c ratio | | | | | 0.54 | | | 0.74 | | | 0.83 | | | 0.92 | |
| Merge Density | | | | | 22.7 | | | 30.1 | | | 33.4 | | | 36.6 | |
| Merge LOS | | | | | C | | | D | | | D | | | E | |

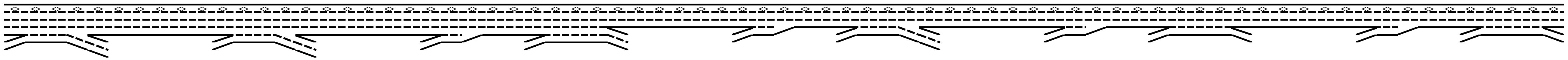


**Key**

<> Express Lane (HOV)

No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | | |
| Diverge Speed Index | | | | | | | | | | | | | | | |
| Diverge Area Speed | | | | | | | | | | | | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | |
| Segment Speed | | | | | | | | | | | | | | | |
| Diverge v/c ratio | | | | | | | | | | | | | | | |
| Diverge Density | | | | | | | | | | | | | | | |
| Diverge LOS | | | | | | | | | | | | | | | |



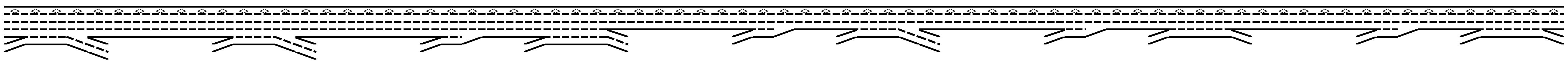
**Key**
<> Express Lane (HOV)
No Trucks

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | #VALUE! | 0.56 | #VALUE! | 0.51 | 0.54 | 0.43 | 0.65 | 0.74 |
| Segment Density | #VALUE! | 19.3 | #VALUE! | 17.5 | 22.7 | 14.6 | 22.9 | 30.1 |
| Segment LOS | #VALUE! | C | #VALUE! | B | C | B | C | D |
| Over Capacity | #VALUE! | | #VALUE! | | | #VALUE! | | |

| Location | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|
| Name | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
| **Summarize Segment Operations** | | | | | | | |
| Segment v/c ratio | 0.58 | 0.73 | 0.83 | #VALUE! | 0.85 | 0.92 | 0.62 |
| Segment Density | 20.1 | 26.2 | 33.4 | #VALUE! | 32.8 | 36.6 | 21.6 |
| Segment LOS | C | D | D | #VALUE! | D | E | C |
| Over Capacity | #VALUE! | | | #VALUE! | | | #VALUE! |

**Project:** **Russell Ranch**
**Freeway Corridor:** **Westbound US 50**

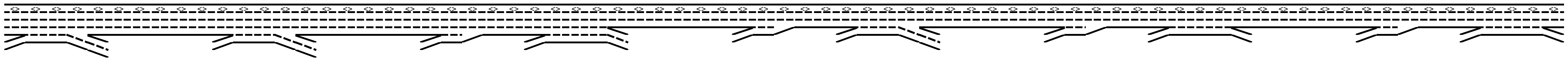
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| hide | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 3 0 0 | 0 1 2 0 0 | 0 1 2 0 0 | 0 1 2 0 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 | 0 1 2 0 |
| hide | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 1 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 | 0 TRUE TRUE FALSE 0 | 0 FALSE TRUE FALSE 0 |
| hide | 1 1 14 2 1 | 0 0 14 0 0 | 1 1 14 2 1 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 2 2 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 2 1 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 1 1 | 0 0 14 0 0 | 1 1 14 0 0 | 1 1 14 1 1 |
| hide | | | | | | | 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 | 0 0 0 0 | 0 0 0 0 |
| **Location** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |




**Key**
<> Express Lane (HOV)
No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Define Freeway Segment** | | | | | | | | | | | | | | | |
| Type | Weave | Basic | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave | Basic | Merge | Weave |
| Length (ft) | 3,500 | 2,500 | 4,000 | 1,650 | 780 | 3,500 | 1,650 | 780 | 5,000 | 1,650 | 780 | 2,000 | 1,400 | 1,250 | 10,500 |
| Accel Length | | | | | 300 | | | 300 | | | 300 | | | 300 | |
| Decel Length | | | | | | | | | | | | | | | |
| Mainline Volume | 3,230 | 3,030 | 3,030 | 3,440 | 3,440 | 3,930 | 3,120 | 3,120 | 3,520 | 3,820 | 3,820 | 4,090 | 4,570 | 4,570 | 4,610 |
| On Ramp Volume | 190 | | 1,140 | | 490 | 100 | | 400 | 770 | | 270 | 1,030 | | 40 | 470 |
| Off Ramp Volume | 390 | | 730 | | | 910 | | | 470 | | | 550 | | | 264 |
| Express Lane Volume | 549 | 515 | 515 | 585 | 585 | 668 | 530 | 530 | 598 | 649 | 649 | 695 | 777 | 777 | 784 |
| EL On Ramp Volume | | | | | | | | | | | | | | | |
| EL Off Ramp Volume | | | | | | | | | | | | | | | |
| | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| **Calculate Flow Rate in General Purpose Lanes (GP)** | | | | | | | | | | | | | | | |
| GP Volume (vph) | 2,871 | 2,515 | 3,655 | 2,855 | 3,345 | 3,362 | 2,590 | 2,990 | 3,692 | 3,171 | 3,441 | 4,425 | 3,793 | 3,833 | 4,296 |
| PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.98 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| GP Lanes | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |
| Terrain | Grade | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Grade | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -3.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| Truck & Bus % | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% | 6.0% |
| 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% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 2.0 | 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 | 4.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.971 | 0.971 | 0.971 | 0.943 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 | 0.971 |
| $f_P$ | 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 | 1.00 |
| GP Flow (pcph) | 3,214 | 2,816 | 4,092 | 3,290 | 3,745 | 3,607 | 2,778 | 3,208 | 3,880 | 3,402 | 3,691 | 4,747 | 4,070 | 4,113 | 4,610 |
| GP Flow (pcphpl) | 804 | 939 | 1,023 | 1,097 | 1,248 | 902 | 1,389 | 1,604 | 1,293 | 1,701 | 1,846 | 1,582 | 2,035 | 2,056 | 1,537 |
| **Calculate Speed in General Purpose Lanes** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calculated FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS Curve | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| **Calculate Operations in General Purpose Lanes** | | | | | | | | | | | | | | | |
| v/c ratio | 0.33 | 0.39 | 0.43 | 0.46 | 0.52 | 0.38 | 0.58 | 0.67 | 0.54 | 0.71 | 0.77 | 0.66 | 0.85 | 0.86 | 0.64 |
| Speed (mph) | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 69.6 | 68.1 | 69.9 | 67.1 | 65.2 | 68.3 | 61.9 | 61.5 | 68.7 |
| Density (pcphpl) | 11.5 | 13.4 | 14.6 | 15.7 | 17.8 | 12.9 | 20.0 | 23.5 | 18.5 | 25.4 | 28.3 | 23.2 | 32.9 | 33.4 | 22.4 |
| LOS | B | B | B | B | B | B | C | C | C | C | D | C | D | D | C |
| **Calculate Operations for Entering GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{IN}$ Vol (pcph) | 3,006 | | 2,917 | | 3,207 | 3,497 | | 2,787 | 3,066 | | 3,406 | 3,658 | | 4,070 | 4,113 |
| $GP_{IN}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 7,200 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{IN}$ v/c ratio | 0.42 | | 0.41 | | 0.45 | 0.49 | | 0.58 | 0.64 | | 0.71 | 0.76 | | 0.85 | 0.86 |
| **Calculate Operations for Exiting GP Lanes** | | | | | | | | | | | | | | | |
| $GP_{OUT}$ Vol (pcph) | 2,812 | | 3,290 | | 3,745 | 2,650 | | 3,208 | 3,385 | | 3,691 | 4,169 | | 4,113 | 4,332 |
| $GP_{OUT}$ Cap (pcph) | 7,200 | | 7,200 | | 7,200 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 | | 4,800 | 4,800 |
| $GP_{OUT}$ v/c ratio | 0.39 | | 0.46 | | 0.52 | 0.55 | | 0.67 | 0.71 | | 0.77 | 0.87 | | 0.86 | 0.90 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



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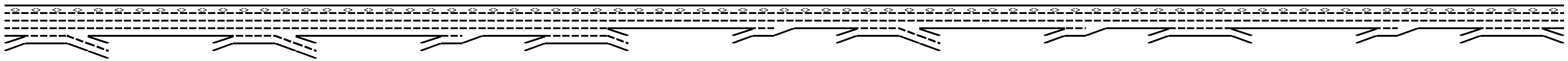
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Flow Rate in Express Lanes (EL)** | | | | | | | | | | | | | | | |
| EL Volume (vph) | 549 | 515 | 515 | 585 | 585 | 668 | 530 | 530 | 598 | 649 | 649 | 695 | 777 | 777 | 784 |
| PHF | 0.92 | 0.92 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.98 | 0.98 | 0.98 |
| Express Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Terrain | Grade | Level | Level | Grade | Level | Grade | Grade | Grade | Level | Grade | Level | Level | Level | Level | Level |
| Grade % | -3.0% | 0.8% | 0.3% | 4.3% | -1.0% | -3.4% | -2.1% | -3.0% | -1.0% | -2.0% | -1.4% | 0.0% | -1.0% | 0.0% | -1.0% |
| Grade Length (mi) | 0.66 | 0.47 | 0.76 | 0.31 | 0.15 | 0.66 | 0.31 | 0.15 | 0.95 | 0.31 | 0.15 | 0.38 | 0.27 | 0.24 | 1.99 |
| 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% | 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% | 0.0% |
| $E_T$ | 1.5 | 1.5 | 1.5 | 2.5 | 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 | 4.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $f_{HV}$ | 0.990 | 0.990 | 0.990 | 0.971 | 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 | 1.00 |
| EL Flow (pcph) | 603 | 565 | 542 | 627 | 615 | 703 | 558 | 558 | 630 | 683 | 683 | 732 | 801 | 801 | 808 |
| EL Flow (pcphpl) | 603 | 565 | 542 | 627 | 615 | 703 | 558 | 558 | 630 | 683 | 683 | 732 | 801 | 801 | 808 |
| ***Calculate Speed in Express Lanes*** | | | | | | | | | | | | | | | |
| Lane Width (ft) | 12 | 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 | >6 |
| TRD | 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 | 1.5 |
| $f_{LW}$ | 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 | 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 | 0.0 |
| Calc'd FFS | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 | 70.9 |
| Measured FFS | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| FFS | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| ***Calculate Operations in Express Lanes*** | | | | | | | | | | | | | | | |
| $EL_{IN}$ v/c ratio | 0.34 | 0.32 | 0.31 | 0.36 | 0.35 | 0.40 | 0.32 | 0.32 | 0.36 | 0.39 | 0.39 | 0.42 | 0.46 | 0.46 | 0.46 |
| **Calculate On Ramp Flow Rate** | | | | | | | | | | | | | | | |
| On Volume (vph) | 190 | | 1,140 | | 490 | 100 | | 400 | 770 | | 270 | 1,030 | | 40 | 470 |
| PHF | 0.92 | | 0.98 | | 0.92 | 0.92 | | 0.96 | 0.96 | | 0.96 | 0.96 | | 0.96 | 0.96 |
| Total Lanes | 1 | | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 |
| Terrain | Level | | Level | | Level | Level | | Level | Level | | Level | Level | | Level | Level |
| Grade % | 2.0% | | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% | | 2.0% | 2.0% |
| 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% | 3.0% | | 3.0% | 3.0% | | 3.0% | 3.0% |
| 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 |
| $f_{HV}$ | 0.990 | | 0.990 | | 0.990 | 0.990 | | 0.990 | 0.985 | | 0.985 | 0.985 | | 0.985 | 0.985 |
| $f_P$ | 1.00 | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 |
| On Flow (pcph) | 209 | | 1,175 | | 538 | 110 | | 421 | 814 | | 285 | 1,089 | | 42 | 497 |
| On Flow (pcphpl) | 209 | | 1,175 | | 538 | 110 | | 421 | 814 | | 285 | 1,089 | | 42 | 497 |
| **Calculate On Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| On Ramp Type | Right | | Right | | Right | Right | | Right | Right | | Right | Right | | Right | Right |
| On Ramp Speed (mph) | 35 | | 35 | | 25 | 45 | | 25 | 45 | | 25 | 45 | | 25 | 35 |
| On Ramp Cap (pcph) | 2,000 | | 2,000 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,100 | | 1,900 | 2,000 |
| On Ramp v/c ratio | 0.10 | | 0.59 | | 0.28 | 0.05 | | 0.22 | 0.39 | | 0.15 | 0.52 | | 0.02 | 0.25 |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



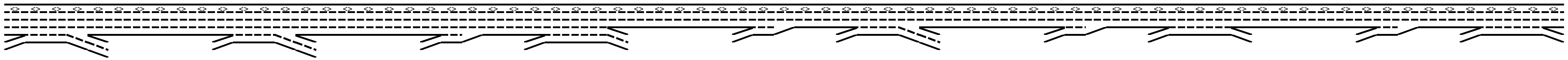
**Key**

<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Off Ramp Flow Rate** | | | | | | | | | | | | | | | |
| Off Volume (vph) | 390 | | 730 | | | 910 | | | 470 | | | 550 | | | 264 |
| PHF | 0.98 | | 0.92 | | | 0.96 | | | 0.96 | | | 0.96 | | | 0.96 |
| Total Lanes | 2 | | 2 | | | 2 | | | 2 | | | 1 | | | 1 |
| Terrain | Level | | Level | | | Level | | | Level | | | Level | | | Level |
| Grade % | 2.0% | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% | | | 2.0% |
| Grade Length (mi) | 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% |
| 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 | | | 0.990 | | | 0.990 | | | 0.990 | | | 0.990 |
| $f_P$ | 1.00 | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 | | | 1.00 |
| Off Flow (pcph) | 402 | | 801 | | | 957 | | | 494 | | | 579 | | | 278 |
| Off Flow (pcphpl) | 201 | | 401 | | | 479 | | | 247 | | | 579 | | | 278 |
| **Calculate Off Ramp Roadway Operations** | | | | | | | | | | | | | | | |
| Off Ramp Type | Right | | Right | | | Right | | | Right | | | Right | | | Right |
| Off Ramp Speed | 25 | | 40 | | | 40 | | | 40 | | | 40 | | | 40 |
| Off Ramp Cap (pcph) | 3,800 | | 4,000 | | | 4,000 | | | 4,000 | | | 2,000 | | | 2,000 |
| Off Ramp v/c ratio | 0.11 | | 0.20 | | | 0.24 | | | 0.12 | | | 0.29 | | | 0.14 |
| **Determine Adjacent Ramp for Three-Lane Mainline Segments with One-Lane** | | | | | | | | | | | | | | | |
| Up Type | | | | | No | | | | On | | | On | | | On |
| Up Distance | | | | | | | | | 780 | | | #REF! | | | #REF! |
| Up Flow (pcph) | | | | | | | | | 421 | | | 285 | | | 42 |
| Down Type | | | | | On | | | | On | | | On | | | #REF! |
| Down Distance | | | | | 780 | | | | 6,650 | | | 1,400 | | | #REF! |
| Down Flow (pcph) | | | | | 110 | | | | 1,089 | | | 497 | | | #REF! |
| **Calculate Merge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | 3,207 | | | 2,787 | | | 3,406 | | | 4,070 | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | 775 | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-3) | | | | | 0.586 | | | 0.586 | | | 0.586 | | | 0.586 | |
| $P_{FM}$ (Eqn 13-4) | | | | | | | | | | | | | | | |
| $P_{FM}$ (Eqn 13-5) | | | | | | | | | | | | | | | |
| $P_{FM}$ | | | | | 0.586 | | | 1.000 | | | 1.000 | | | 1.000 | |
| $v_{12}$ (pcph) | | | | | 1,879 | | | 2,787 | | | 3,406 | | | 4,070 | |
| $v_3$ (pcph) | | | | | 1,328 | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | 1,879 | | | 2,787 | | | 3,406 | | | 4,070 | |
| $v_{R12a}$ (pcph) | | | | | 2,417 | | | 3,208 | | | 3,691 | | | 4,113 | |
| Merge Speed Index | | | | | 0.35 | | | 0.40 | | | 0.46 | | | 0.54 | |
| Merge Area Speed | | | | | 60.2 | | | 58.7 | | | 57.1 | | | 54.8 | |
| Outer Lanes Volume | | | | | 1,328 | | | | | | | | | | |
| Outer Lanes Speed | | | | | 67.0 | | | | | | | | | | |
| Segment Speed | | | | | 62.5 | | | 58.7 | | | 57.1 | | | 54.8 | |
| Merge v/c ratio | | | | | 0.53 | | | 0.70 | | | 0.80 | | | 0.89 | |
| Merge Density | | | | | 22.2 | | | 28.4 | | | 32.3 | | | 35.7 | |
| Merge LOS | | | | | C | | | D | | | D | | | E | |

| Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



**Key**

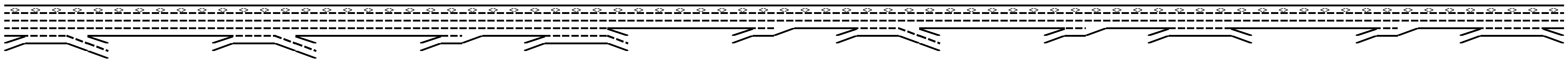
<> Express Lane (HOV)

No Trucks

| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Calculate Diverge Influence Area Operations** | | | | | | | | | | | | | | | |
| Effective $v_P$ (pcph) | | | | | | | | | | | | | | | |
| Up Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| Down Ramp $L_{EQ}$ | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-9) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-10) | | | | | | | | | | | | | | | |
| $P_{FD}$ (Eqn 13-11) | | | | | | | | | | | | | | | |
| $P_{FD}$ | | | | | | | | | | | | | | | |
| $v_{12}$ (pcph) | | | | | | | | | | | | | | | |
| $v_3$ (pcph) | | | | | | | | | | | | | | | |
| $v_{34}$ (pcph) | | | | | | | | | | | | | | | |
| $v_{12a}$ (pcph) | | | | | | | | | | | | | | | |
| Diverge Speed Index | | | | | | | | | | | | | | | |
| Diverge Area Speed | | | | | | | | | | | | | | | |
| Outer Lanes Volume | | | | | | | | | | | | | | | |
| Outer Lanes Speed | | | | | | | | | | | | | | | |
| Segment Speed | | | | | | | | | | | | | | | |
| Diverge v/c ratio | | | | | | | | | | | | | | | |
| Diverge Density | | | | | | | | | | | | | | | |
| Diverge LOS | | | | | | | | | | | | | | | |

| **Location** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Name | Silva Valley to El Dorado Weave | Between Ramps | El Dorado Hills to Empire Weave | Between Empire Ranch Ramps | Empire Ranch Loop On Ramp | Empire Ranch to E. Bidwell Weave | Between E. Bidwell St Ramps | E. Bidwell St Loop On-Ramp |
| **Summarize Segment Operations** | | | | | | | | |
| Segment v/c ratio | 0.33 | 0.39 | #VALUE! | 0.46 | 0.53 | 0.38 | 0.58 | 0.70 |
| Segment Density | 11.5 | 13.4 | #VALUE! | 15.7 | 22.2 | 12.9 | 20.0 | 28.4 |
| Segment LOS | B | B | #VALUE! | B | C | B | C | D |
| Over Capacity | #VALUE! | | #VALUE! | | | #VALUE! | | |

| **Location** | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|
| Name | E. Bidwell to Oak Ave Weave | Between Oak Ave Ramps | Oak Ave Loop On-Ramp | Oak Ave to Prairie City Weave | Between Prairie City Ramps | Prairie City Loop On Ramp | Prairie City Slip to Folsom Weave |
| **Summarize Segment Operations** | | | | | | | |
| Segment v/c ratio | 0.54 | 0.71 | 0.80 | #VALUE! | 0.85 | 0.89 | 0.64 |
| Segment Density | 18.5 | 25.4 | 32.3 | #VALUE! | 32.9 | 35.7 | 22.4 |
| Segment LOS | B | C | D | #VALUE! | D | E | B |
| Over Capacity | #VALUE! | | | #VALUE! | | | #VALUE! |



**Key**

<> Express Lane (HOV)

No Trucks

# Leisch Method for Weaving Analysis

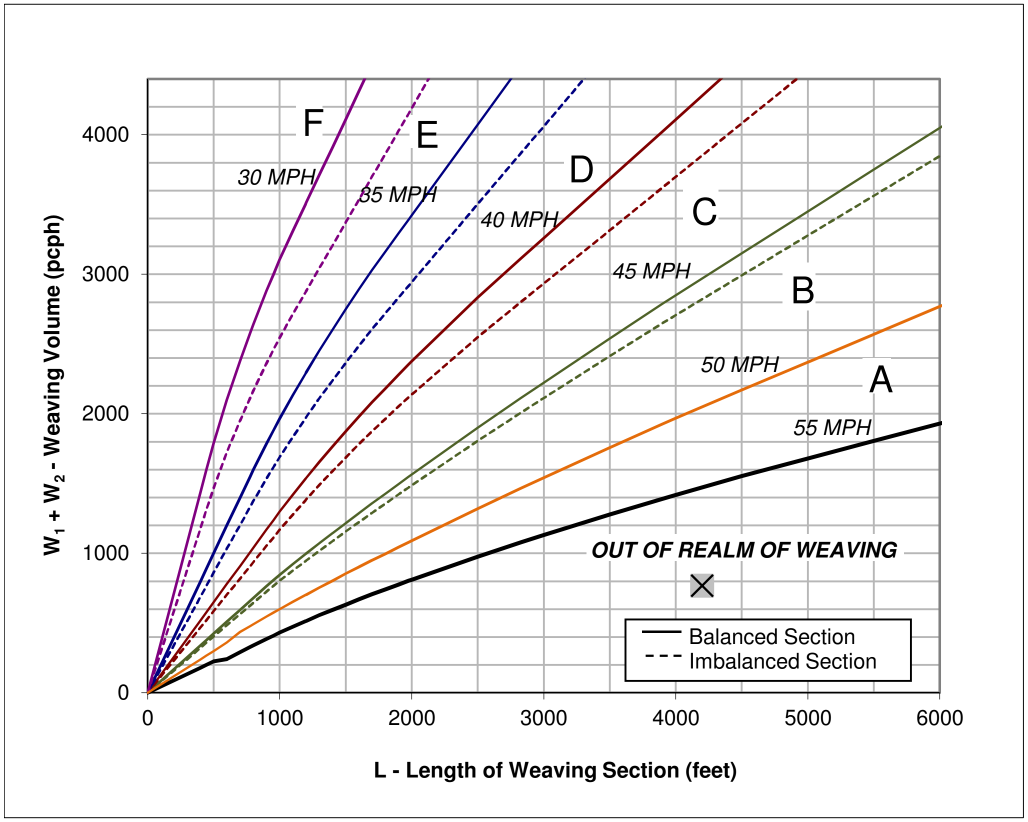
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,200 |

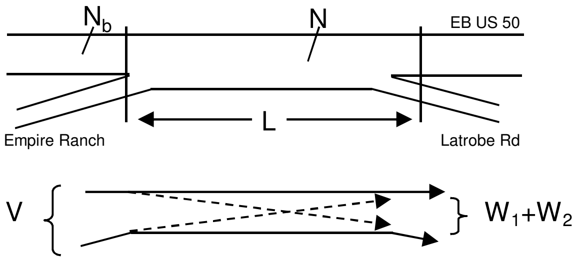
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | EB US 50 |
| On-ramp | Empire Ranch |
| Off-ramp | Latrobe Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,760 | Volume (vph)* | 170 | Volume (vph)* | 590 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 3,873 | Volume (pcph) | 172 | Volume (pcph) | 596 |




**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?
   **MPH** and **MPH**
   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) #N/A
4. Weaving Intensity Factor (k) #N/A
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ #N/A
6. Level of Service (LOS) #N/A

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

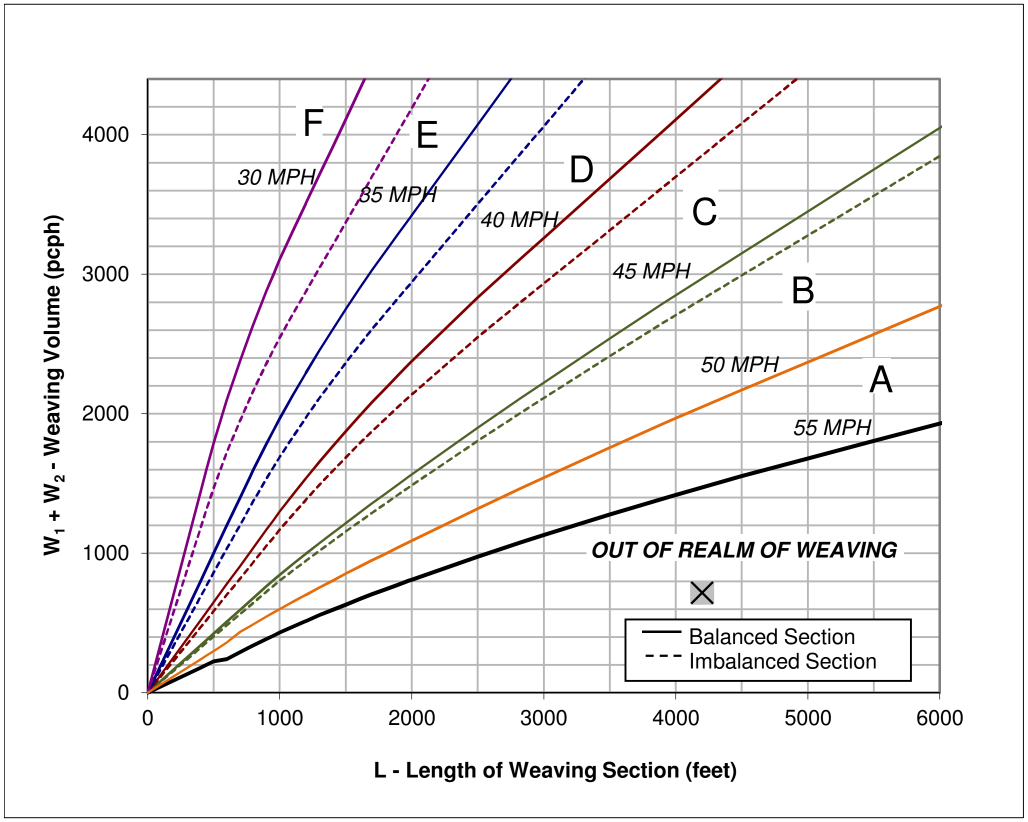
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,200 |

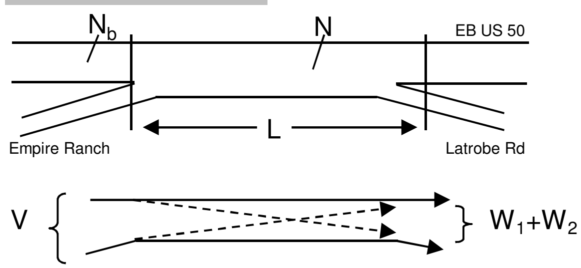
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | EB US 50 |
| On-ramp | Empire Ranch |
| Off-ramp | Latrobe Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,560 | Volume (vph)* | 150 | Volume (vph)* | 560 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,727 | Volume (pcph) | 152 | Volume (pcph) | 566 |




## 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?

   **MPH** and **MPH**

   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) 52.4
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,145

6. Level of Service (LOS) B

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

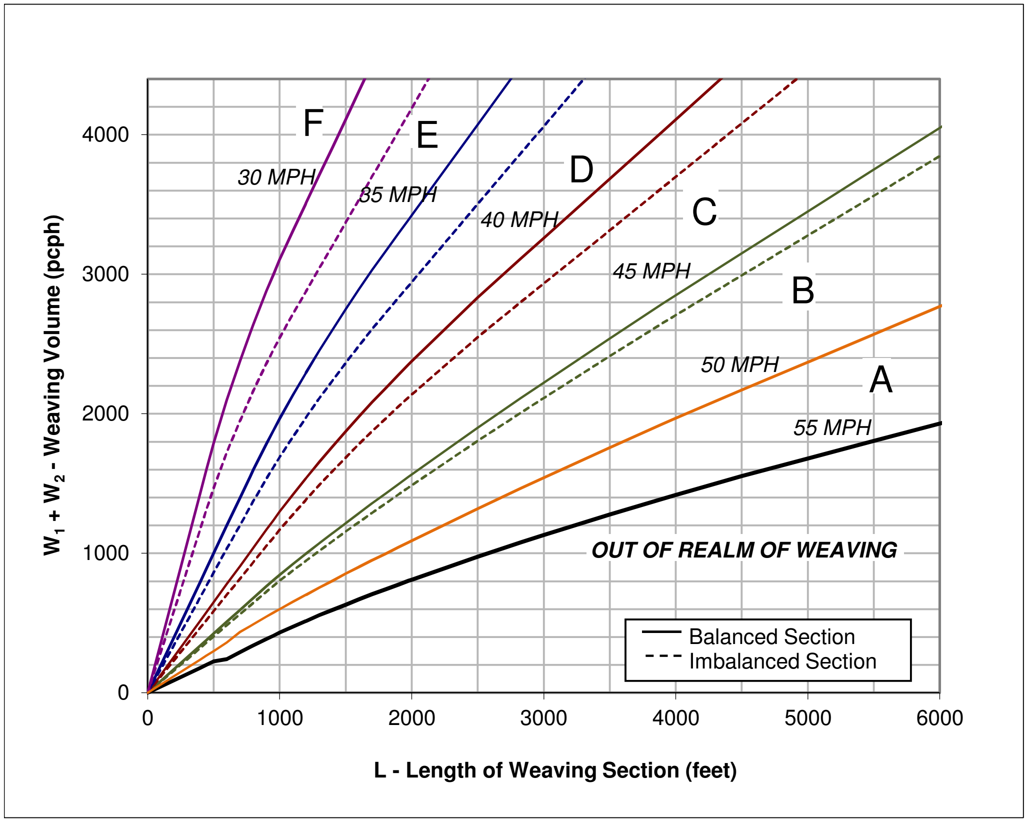
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 11,700 |

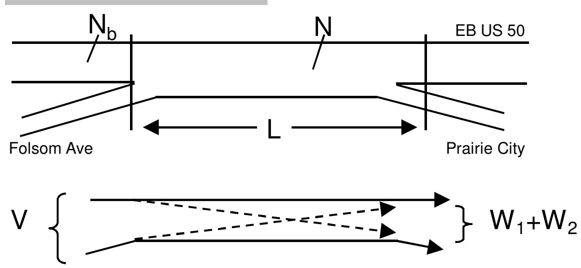
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | EB US 50 |
| On-ramp | Folsom Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,320 | Volume (vph)* | 306 | Volume (vph)* | 290 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,480 | Volume (pcph) | 309 | Volume (pcph) | 293 |




**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?
   MPH and MPH
   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) #N/A
4. Weaving Intensity Factor (k) #N/A
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ #N/A
6. Level of Service (LOS) #N/A

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

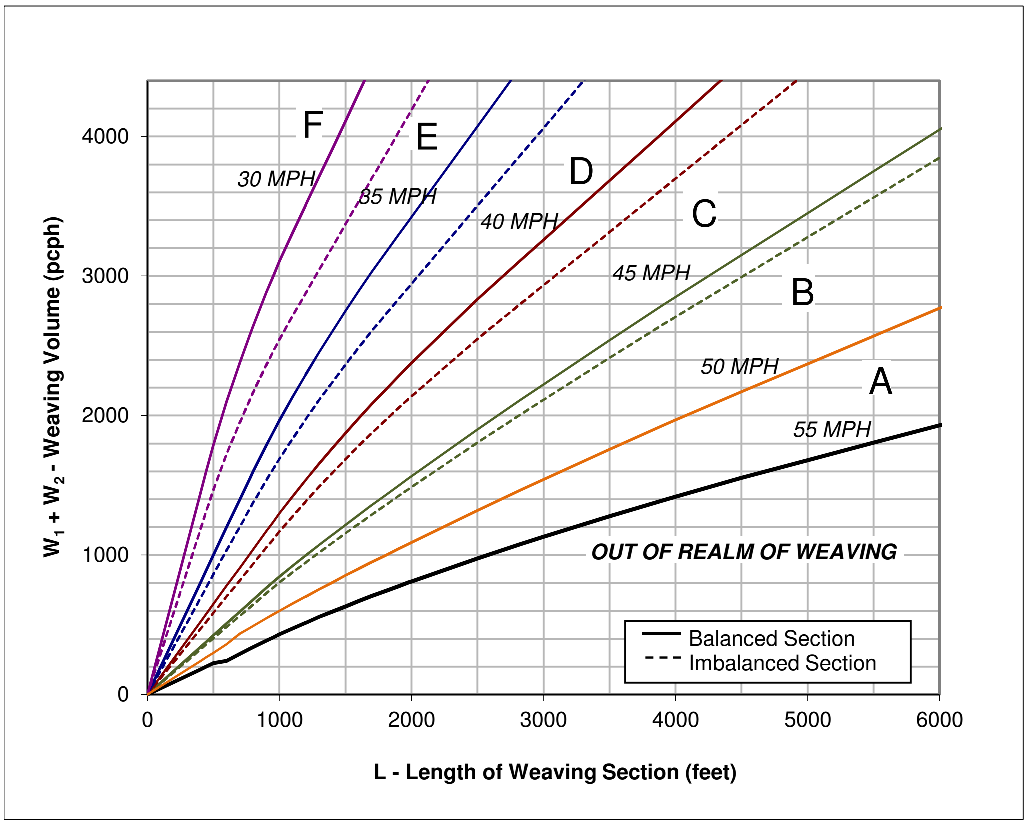
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 11,700 |

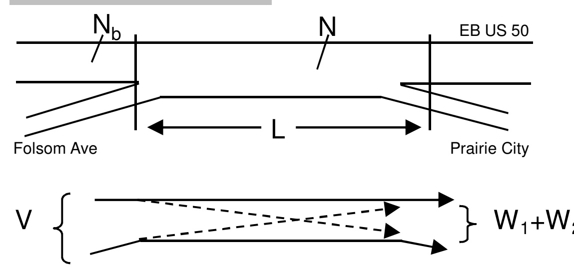
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | EB US 50 |
| On-ramp | Folsom Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 6,590 | Volume (vph)* | 382 | Volume (vph)* | 940 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 6,788 | Volume (pcph) | 386 | Volume (pcph) | 949 |




## 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?
   MPH and MPH
   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) 52.0
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,697
6. 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.

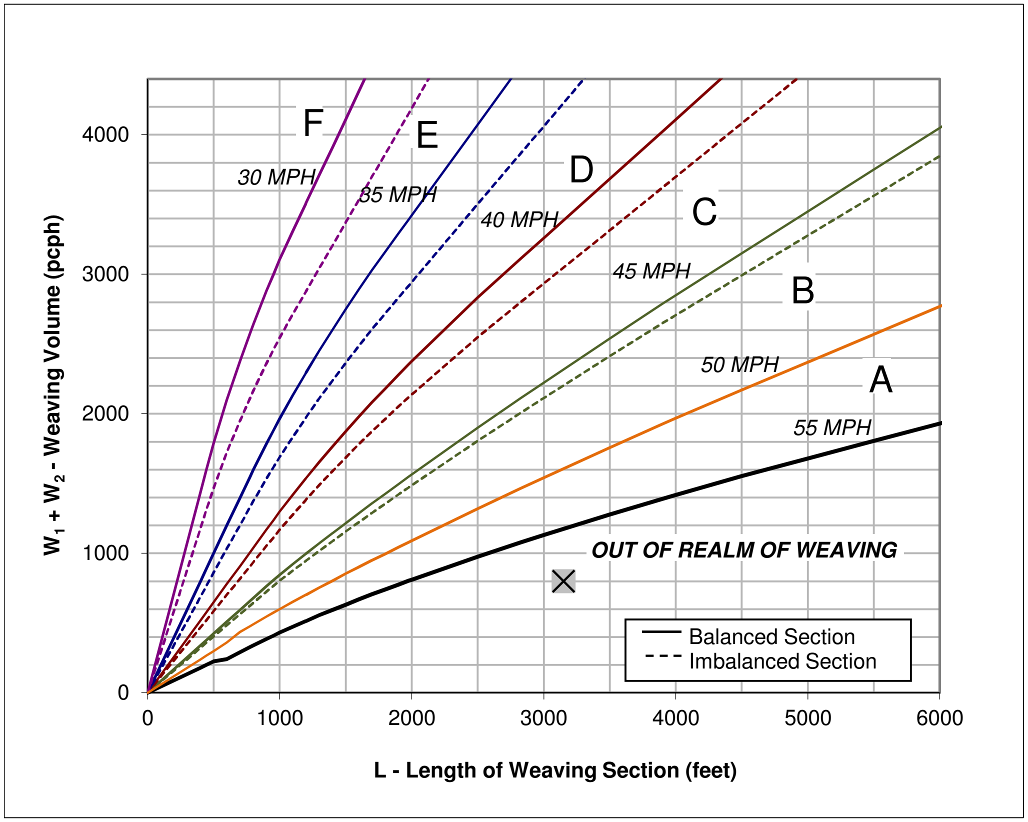
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

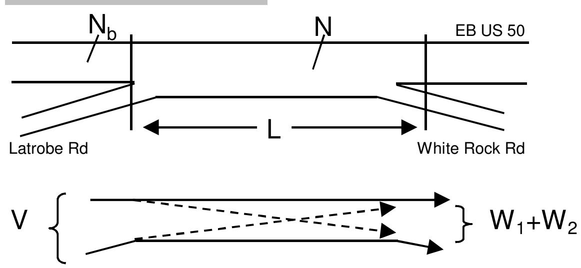
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,150 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | EB US 50 |
| On-ramp | Latrobe Rd |
| Off-ramp | White Rock Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,410 | Volume (vph)* | 470 | Volume (vph)* | 322 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 2.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 3,615 | Volume (pcph) | 475 | Volume (pcph) | 325 |




## 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?
   **MPH** and **MPH**
   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) 53.4
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 723
6. Level of Service (LOS) A

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

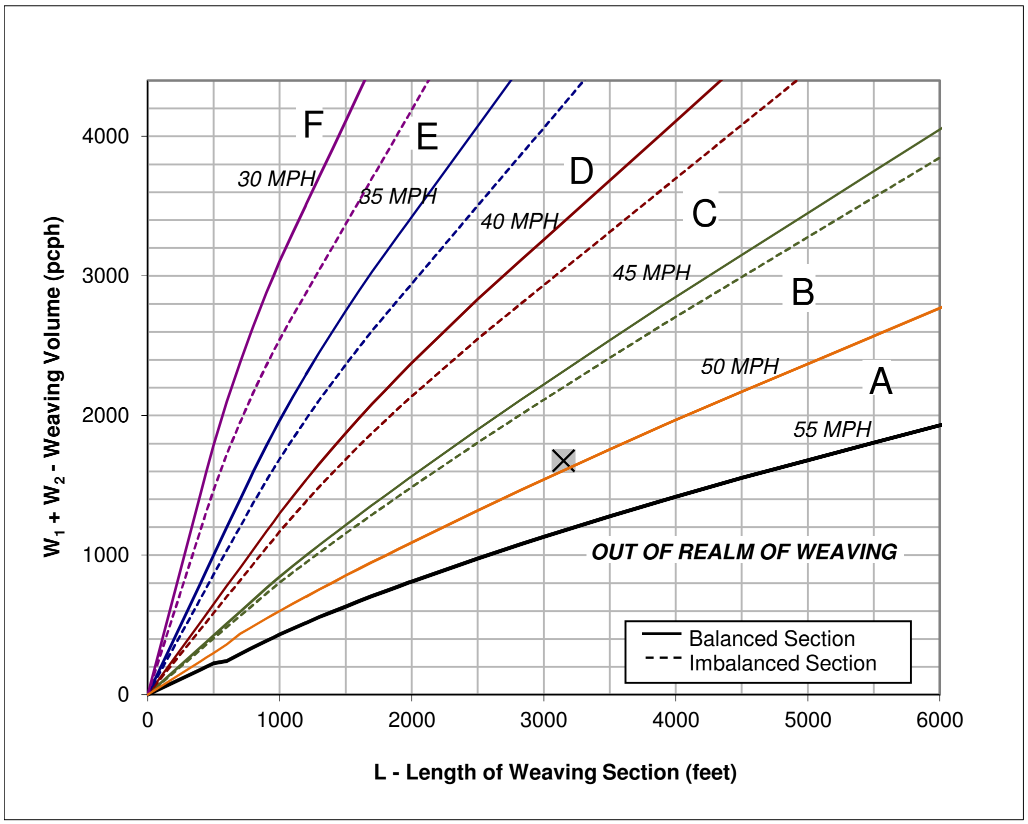
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,150 |

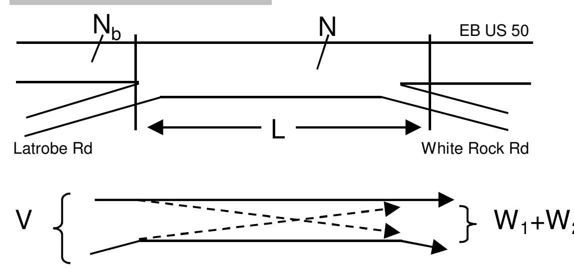
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | EB US 50 |
| On-ramp | Latrobe Rd |
| Off-ramp | White Rock Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,280 | Volume (vph)* | 860 | Volume (vph)* | 799 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 2.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,597 | Volume (pcph) | 869 | Volume (pcph) | 807 |




## 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?
   **45 MPH** and **50 MPH**

   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) — 49.4
4. Weaving Intensity Factor (k) — 1.28
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ — 1,165
6. Level of Service (LOS) — B

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

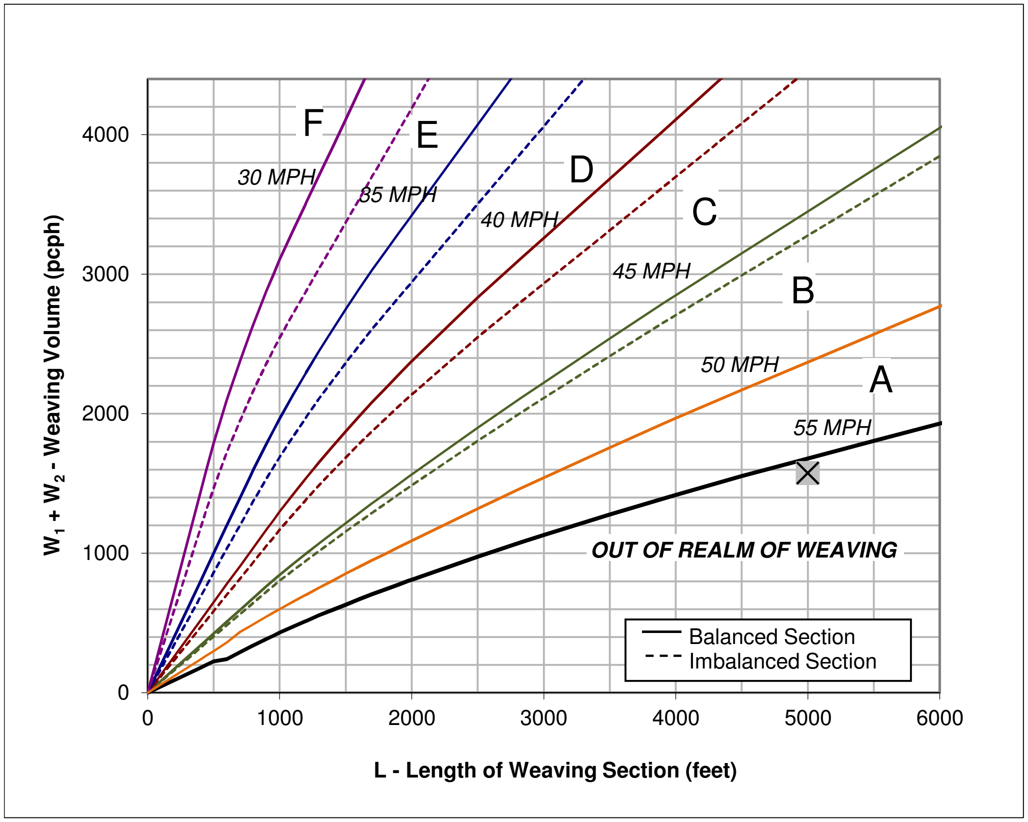
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

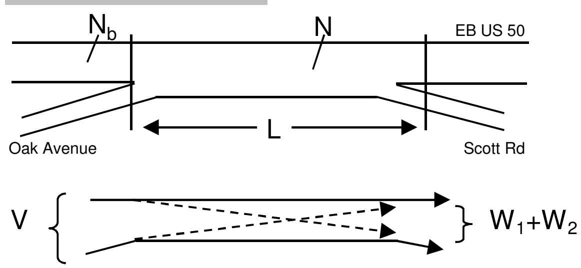
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | EB US 50 |
| On-ramp | Oak Avenue |
| Off-ramp | Scott Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,750 | Volume (vph)* | 140 | Volume (vph)* | 1,420 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,893 | Volume (pcph) | 141 | Volume (pcph) | 1,434 |




## 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?
   **MPH** and **MPH**
   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) 54.7
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,223
6. 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

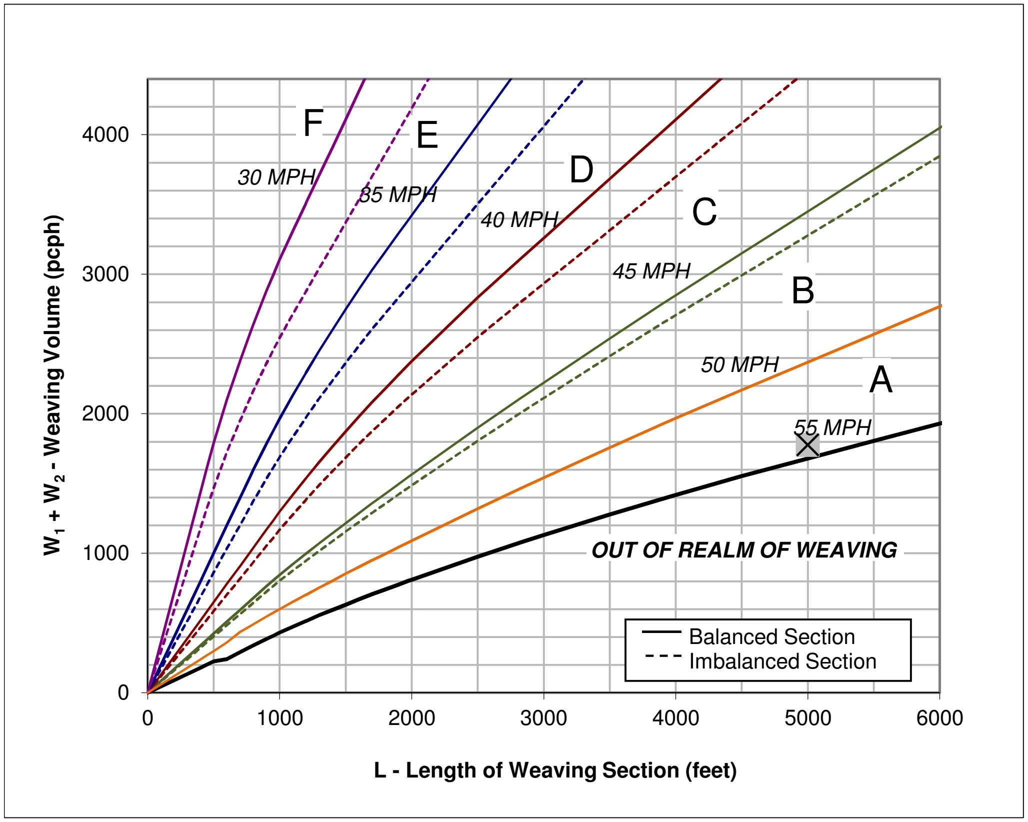
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

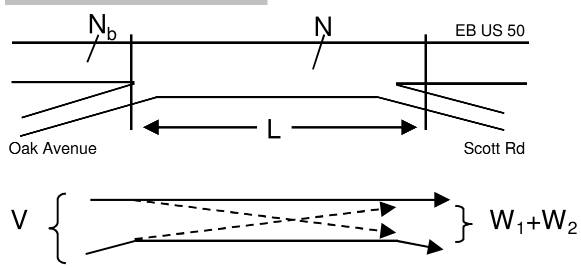
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | EB US 50 |
| On-ramp | Oak Avenue |
| Off-ramp | Scott Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,590 | Volume (vph)* | 320 | Volume (vph)* | 1,440 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,758 | Volume (pcph) | 323 | Volume (pcph) | 1,454 |




## 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?
   **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.
3. Interpolated Weaving Speed ($S_w$, mph) **54.3**
4. Weaving Intensity Factor (k) **1.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,439**
6. 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

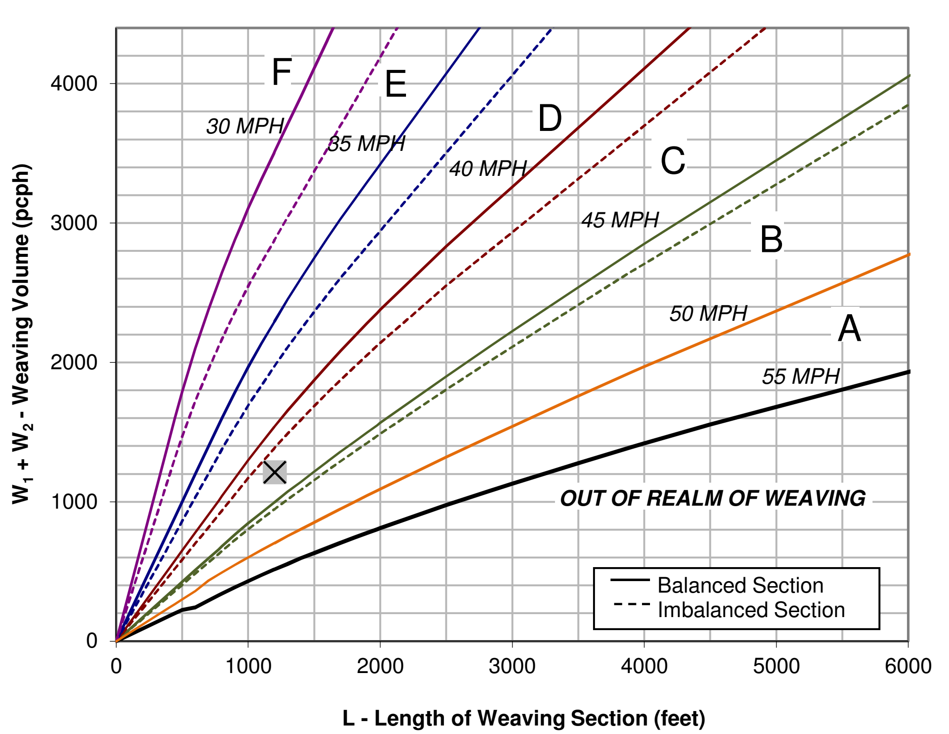
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 1,200 |

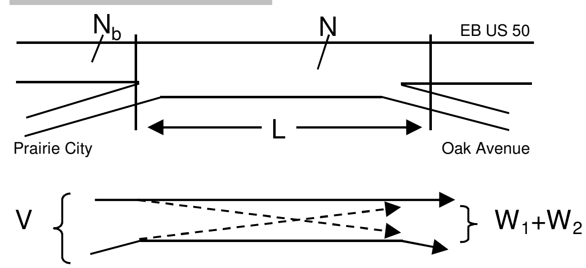
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | EB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Oak Avenue |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,380 | Volume (vph)* | 290 | Volume (vph)* | 910 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,541 | Volume (pcph) | 293 | Volume (pcph) | 919 |




## 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?
   **40 MPH** and **45 MPH**
   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) 42.0
4. Weaving Intensity Factor (k) 2.98
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,531
6. 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

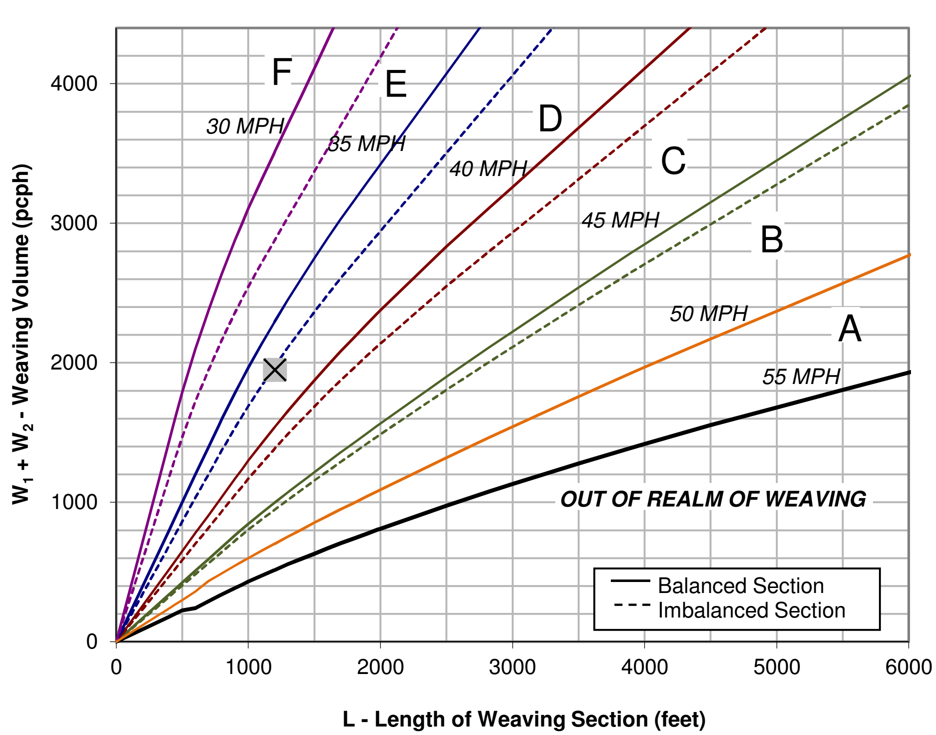
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 1,200 |

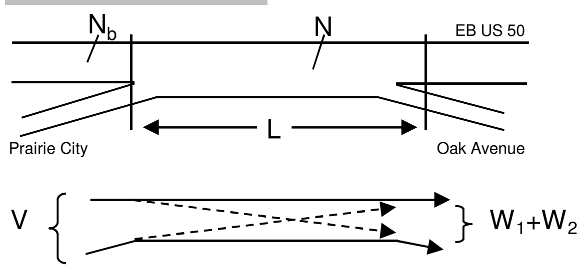
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | EB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Oak Avenue |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 6,420 | Volume (vph)* | 620 | Volume (vph)* | 1,310 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 6,613 | Volume (pcph) | 626 | Volume (pcph) | 1,323 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **40 MPH** and **45 MPH**
   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): 36.2
4. Weaving Intensity Factor (k): 2.83
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$: 1,939
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

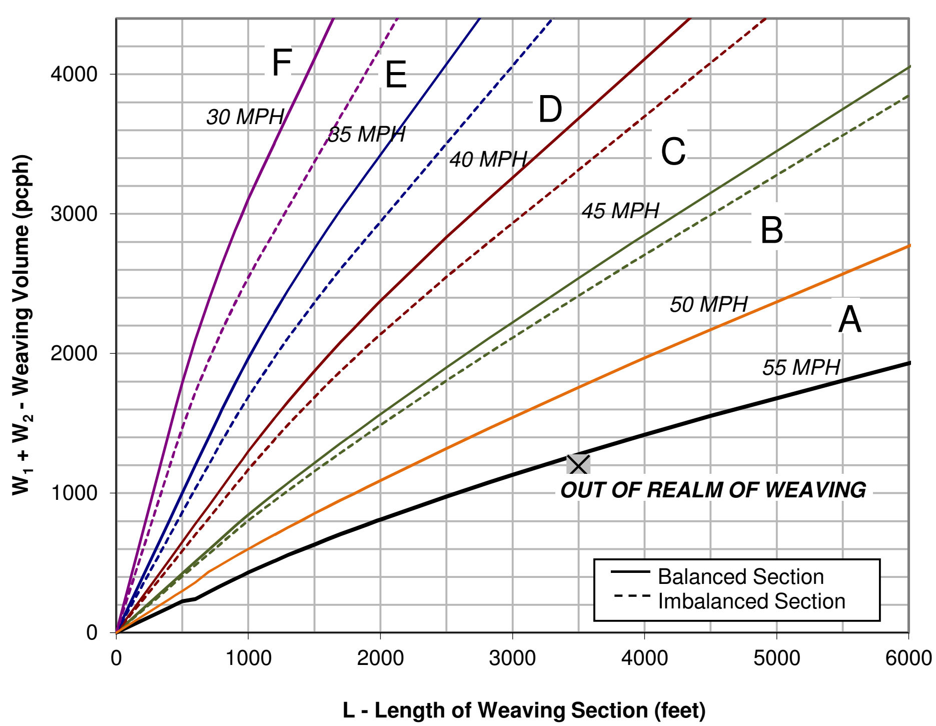
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

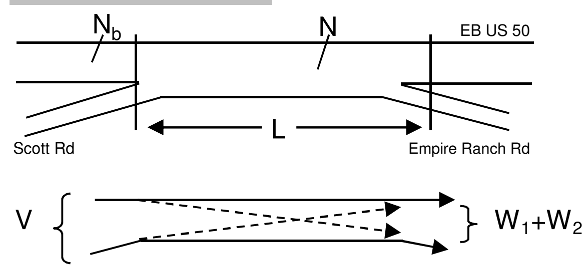
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | EB US 50 |
| On-ramp | Scott Rd |
| Off-ramp | Empire Ranch Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,920 | Volume (vph)* | 470 | Volume (vph)* | 710 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 4.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,626 | Volume (pcph) | 475 | Volume (pcph) | 717 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**

   [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?

   **MPH** and **MPH**

   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) #N/A
4. Weaving Intensity Factor (k) #N/A
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ #N/A

6. Level of Service (LOS) #N/A

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.

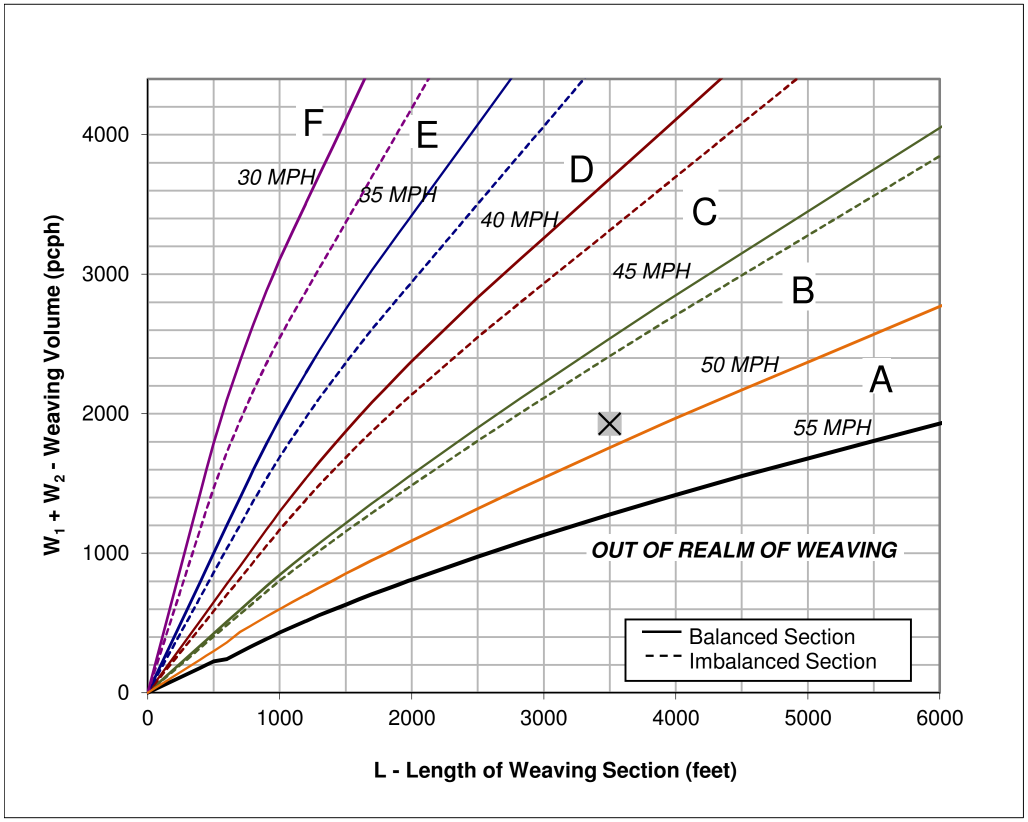
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

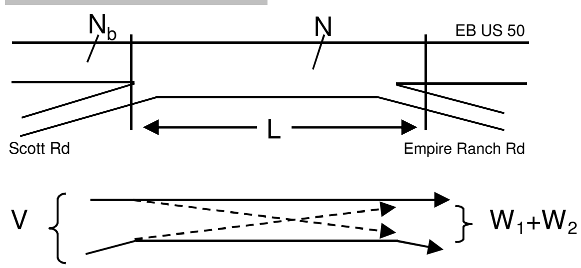
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | EB US 50 |
| On-ramp | Scott Rd |
| Off-ramp | Empire Ranch Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,870 | Volume (vph)* | 880 | Volume (vph)* | 1,030 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 4.0 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 6,927 | Volume (pcph) | 889 | Volume (pcph) | 1,040 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   [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?

   **45 MPH** and **50 MPH**

   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) 48.9
4. Weaving Intensity Factor (k) 1.37
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,451

6. 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

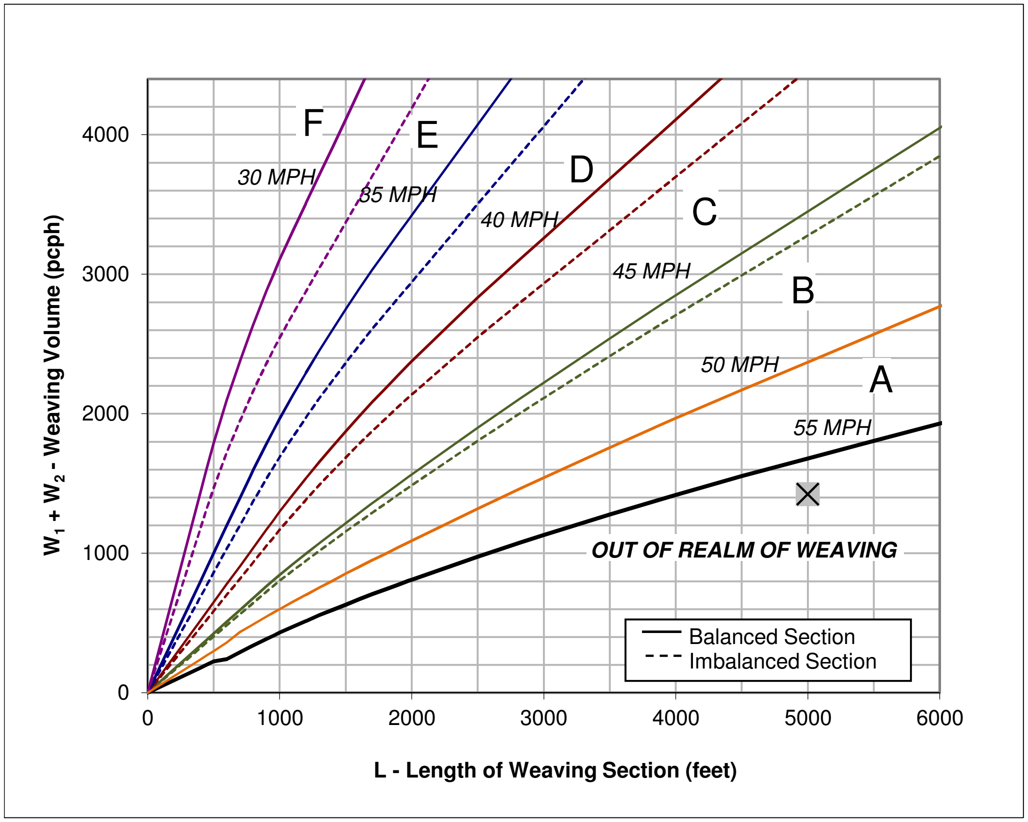
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

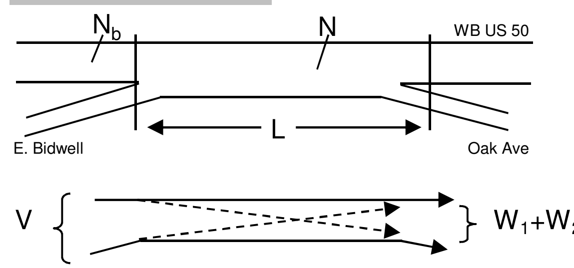
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | WB US 50 |
| On-ramp | E. Bidwell |
| Off-ramp | Oak Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,690 | Volume (vph)* | 780 | Volume (vph)* | 630 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,831 | Volume (pcph) | 788 | Volume (pcph) | 636 |




## 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?
   **MPH** and **MPH**
   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) — 54.2
4. Weaving Intensity Factor (k) — 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ — 1,208
6. 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

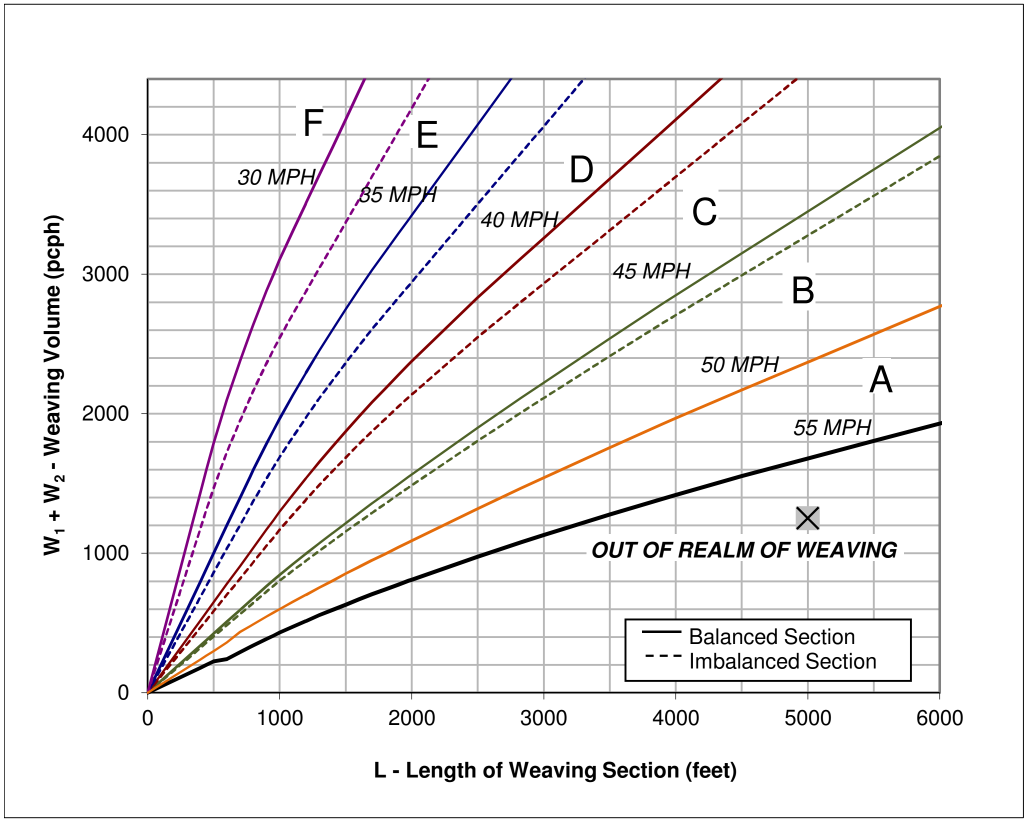
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 5,000 |

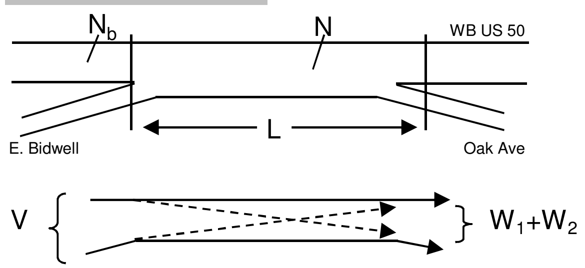
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | WB US 50 |
| On-ramp | E. Bidwell |
| Off-ramp | Oak Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,290 | Volume (vph)* | 770 | Volume (vph)* | 470 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,419 | Volume (pcph) | 778 | Volume (pcph) | 475 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **MPH** and **MPH**
   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) 53.7
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,105
6. 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.

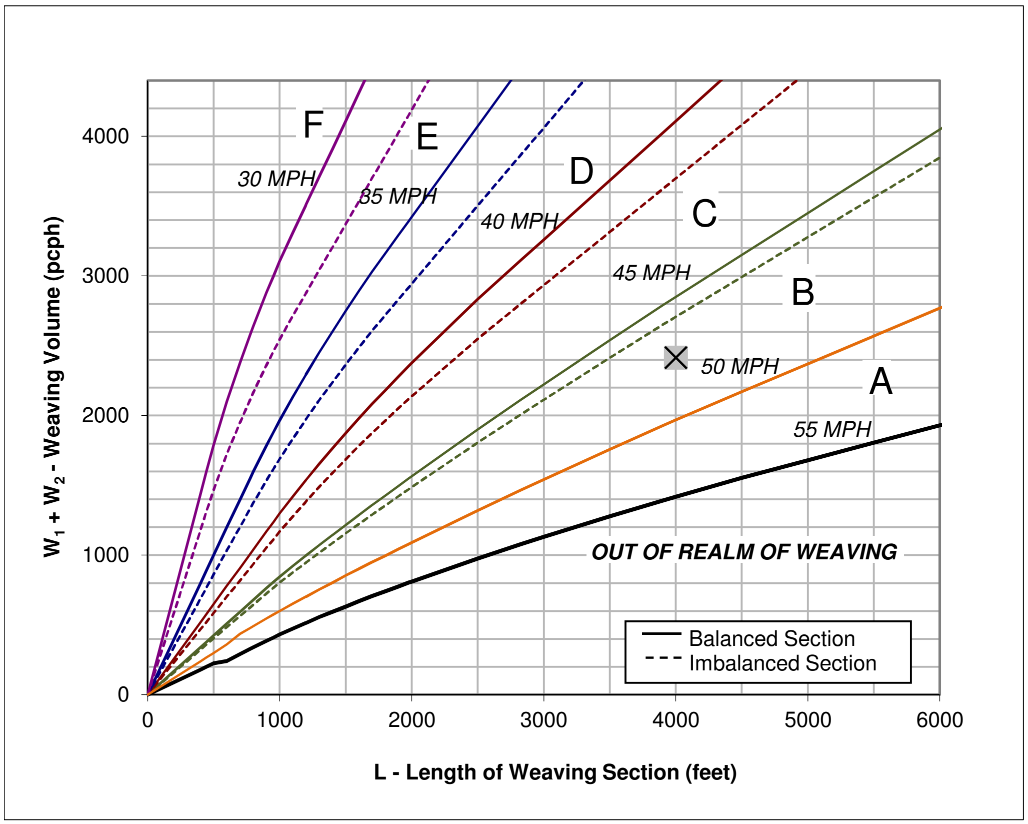
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

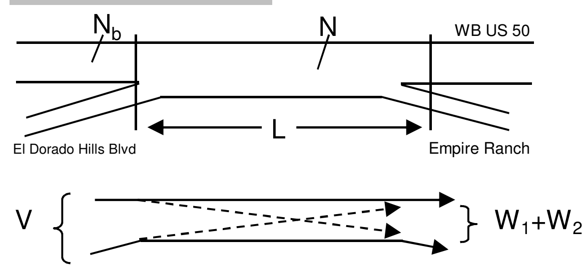
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,000 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | WB US 50 |
| On-ramp | El Dorado Hills Blvd Empire |
| Off-ramp | Ranch |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,440 | Volume (vph)* | 930 | Volume (vph)* | 1,460 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,603 | Volume (pcph) | 939 | Volume (pcph) | 1,475 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**

   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) 47.5
4. Weaving Intensity Factor (k) 1.60
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,233
6. 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

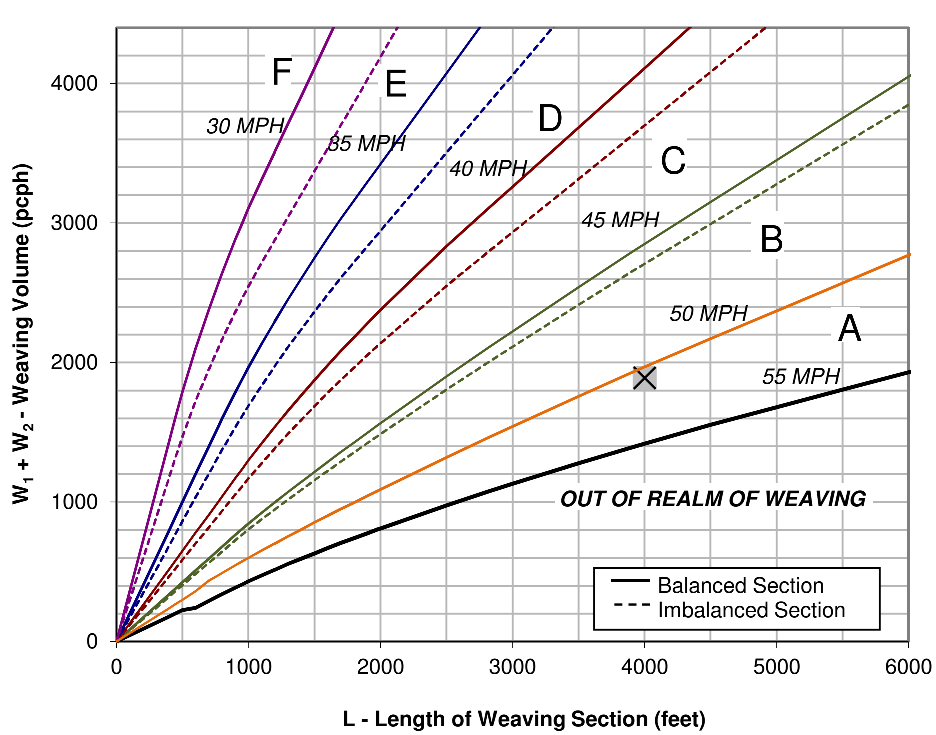
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 4,000 |

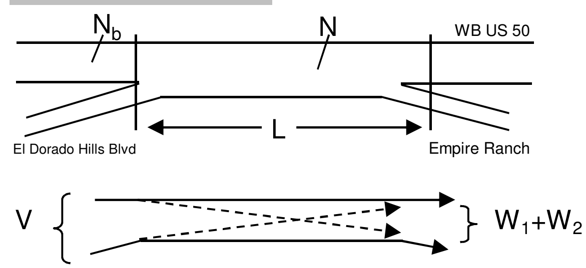
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | WB US 50 |
| On-ramp | El Dorado Hills Blvd Empire |
| Off-ramp | Ranch |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,170 | Volume (vph)* | 1,140 | Volume (vph)* | 730 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,295 | Volume (pcph) | 1,151 | Volume (pcph) | 737 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **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.
3. Interpolated Weaving Speed ($S_w$, mph) 50.7
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   SV = (1/N)*[V + (k - 1)*min($W_1$, $W_2$)] 859
6. Level of Service (LOS) B

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

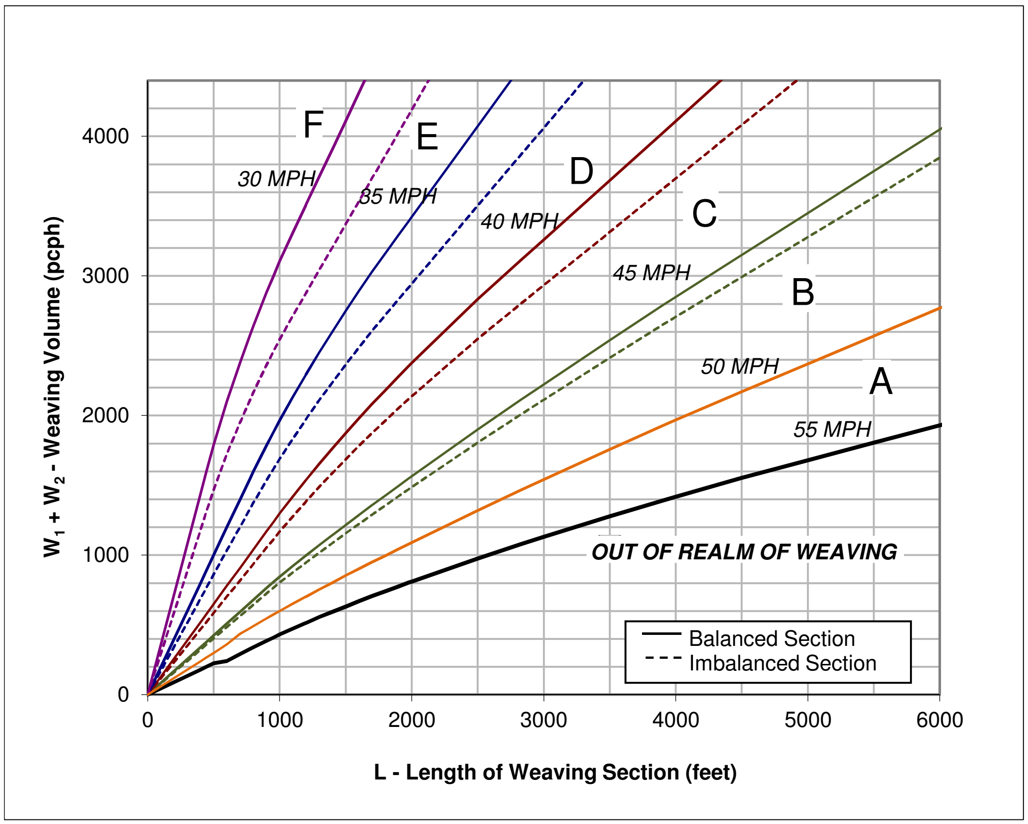
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

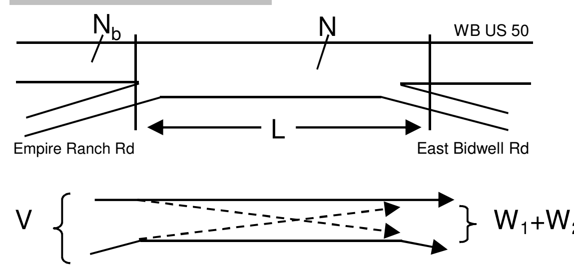
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | WB US 50 |
| On-ramp | Empire Ranch Rd East |
| Off-ramp | Bidwell Rd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,510 | Volume (vph)* | 190 | Volume (vph)* | 860 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,645 | Volume (pcph) | 192 | Volume (pcph) | 869 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**
   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) — 54.5
4. Weaving Intensity Factor (k) — 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ — 929
6. Level of Service (LOS) — B

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

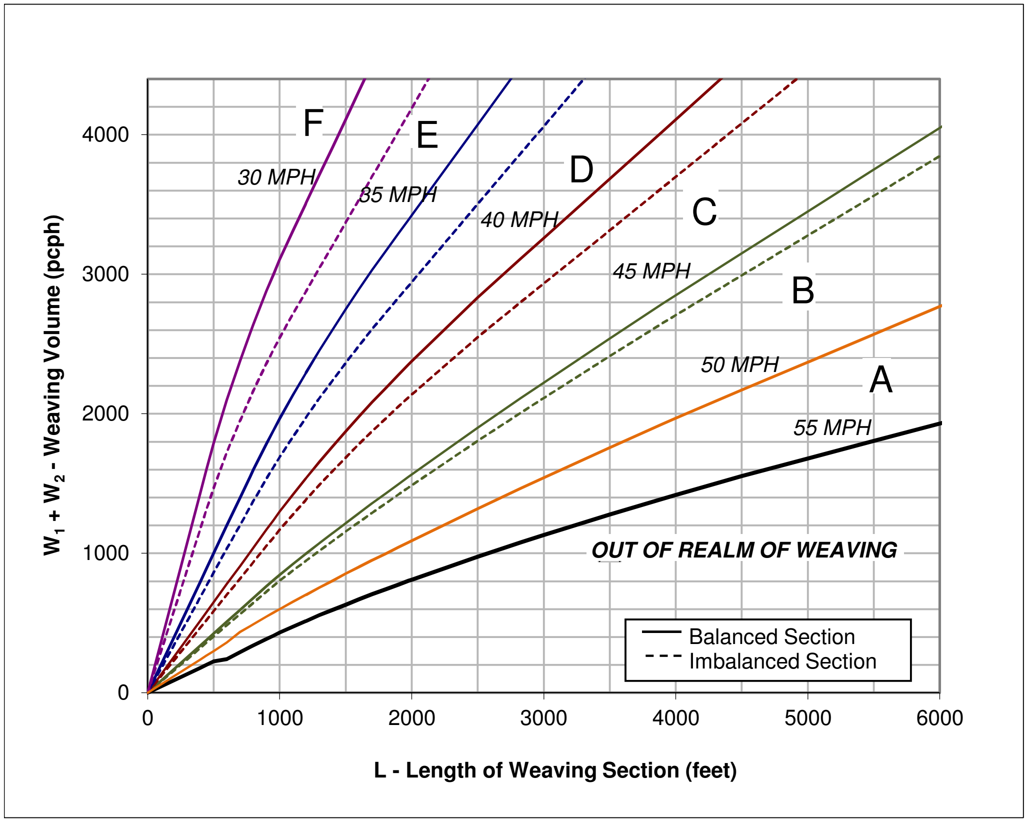
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

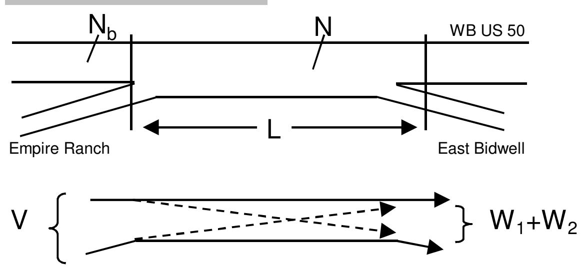
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | WB US 50 |
| On-ramp | Empire Ranch |
| Off-ramp | East Bidwell |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 4,030 | Volume (vph)* | 100 | Volume (vph)* | 910 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 4,151 | Volume (pcph) | 101 | Volume (pcph) | 919 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**
   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) 54.7
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   SV = $(1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 830
6. Level of Service (LOS) A

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

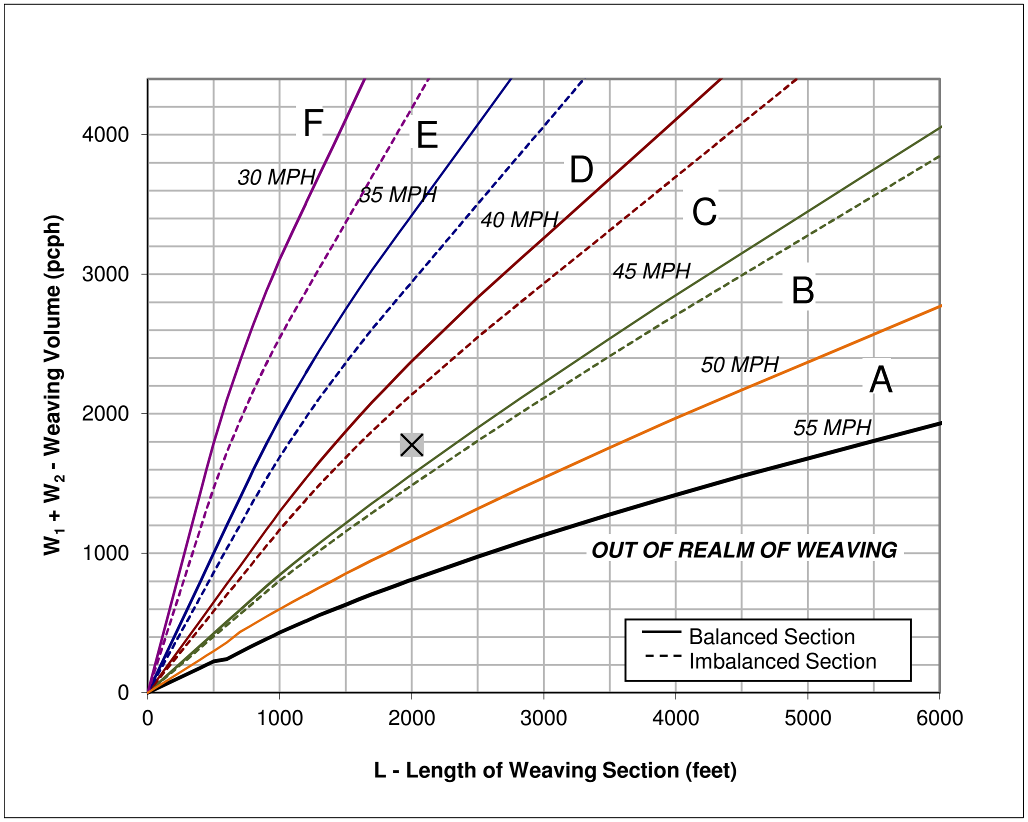
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 2,000 |

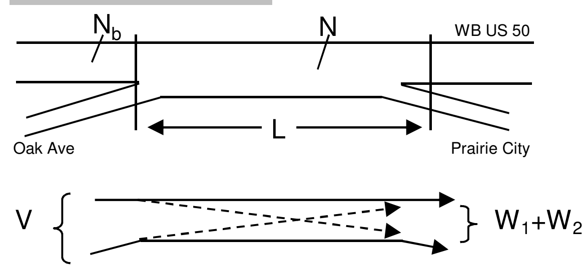
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | WB US 50 |
| On-ramp | Oak Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,490 | Volume (vph)* | 1,100 | Volume (vph)* | 660 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,655 | Volume (pcph) | 1,111 | Volume (pcph) | 667 |




**Figure**




**Capacity Analysis**

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **40 MPH** and **45 MPH**
   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) 43.7
4. Weaving Intensity Factor (k) 2.14
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,603
6. 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, July 24, 2009

# Leisch Method for Weaving Analysis

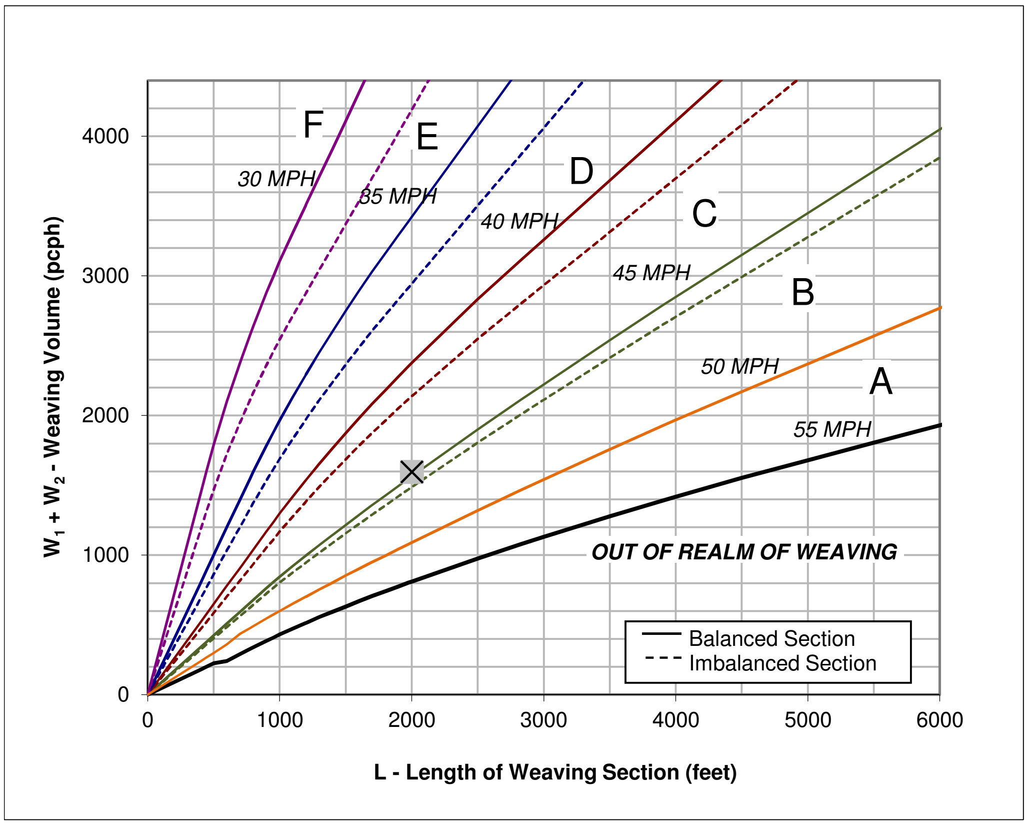
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 2,000 |

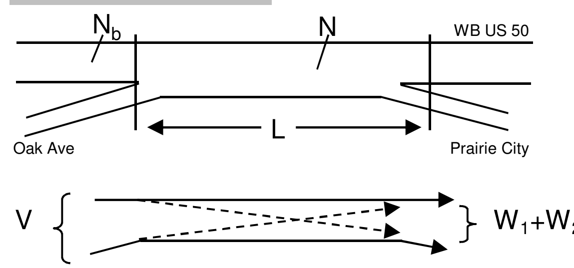
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | WB US 50 |
| On-ramp | Oak Ave |
| Off-ramp | Prairie City |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,120 | Volume (vph)* | 1,030 | Volume (vph)* | 550 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,274 | Volume (pcph) | 1,040 | Volume (pcph) | 556 |




## 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?
   **40 MPH** and **45 MPH**
   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) 44.2
4. Weaving Intensity Factor (k) 2.07
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,467
6. 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.

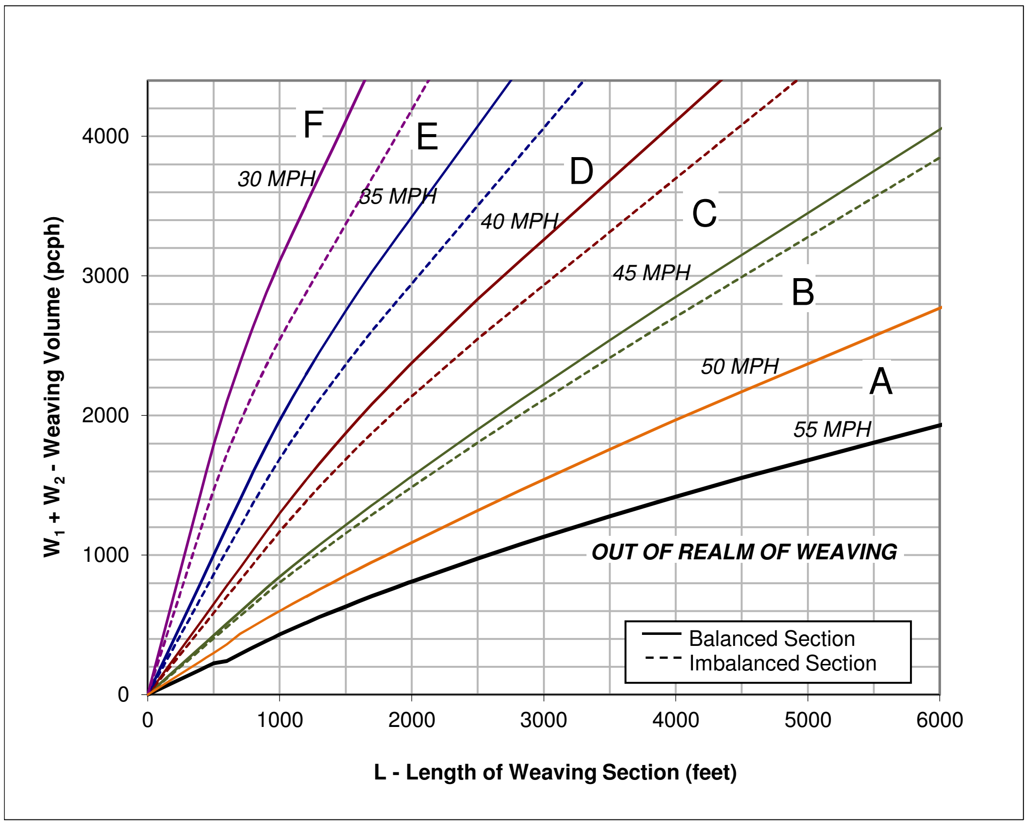
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983 and *Highway Design Manual*, California Department of Transportation, July 24, 2009

# Leisch Method for Weaving Analysis

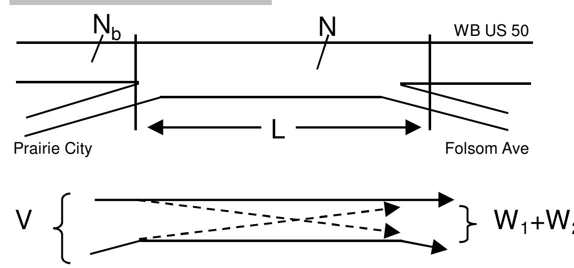
| Data Input | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 10,500 |

| Project Information | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | WB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Folsom Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,300 | Volume (vph)* | 300 | Volume (vph)* | 375 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,459 | Volume (pcph) | 303 | Volume (pcph) | 379 |




## 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?
   **MPH** and **MPH**
   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) **51.1**
4. Weaving Intensity Factor (k) **1.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,365**
6. 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

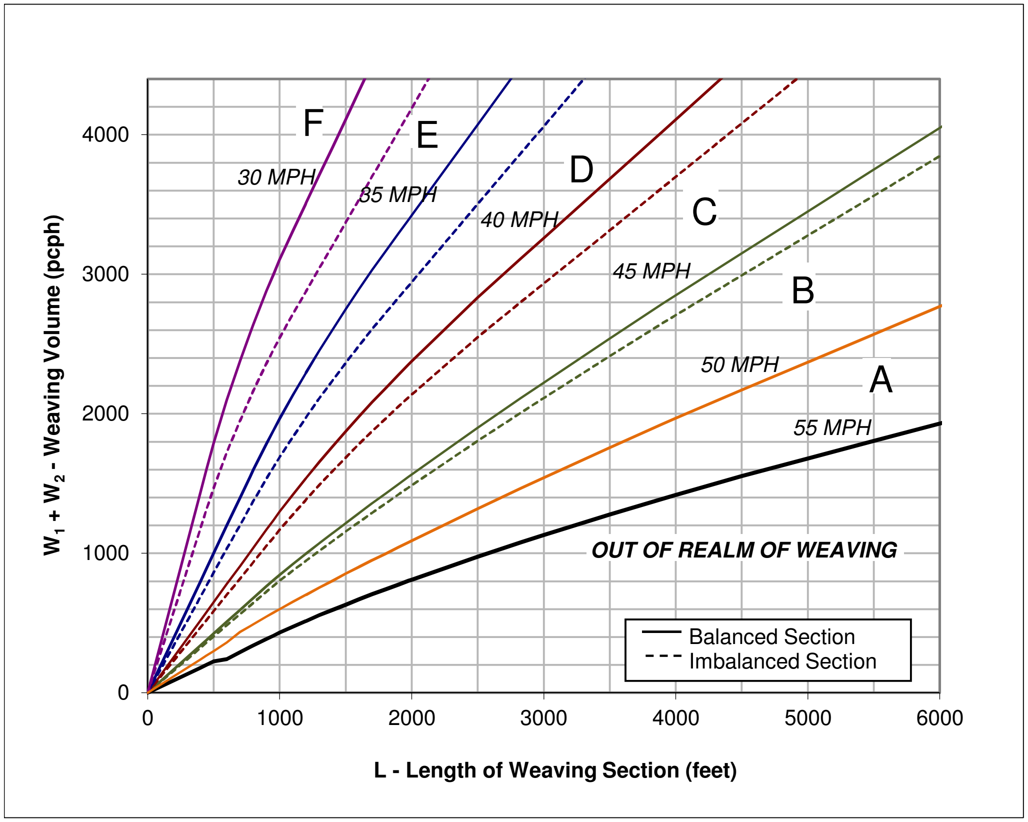
**Data Input**

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 3 |
| Number of Lanes in Weaving Section | N | 4 |
| Length of Weaving Section (feet) | L | 10,500 |

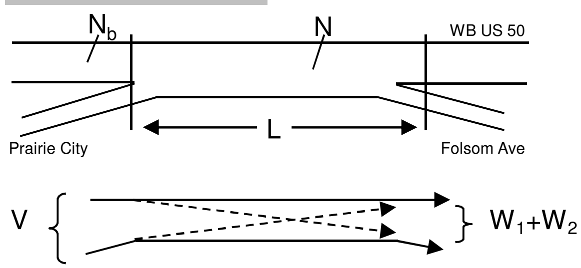
**Project Information**

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | WB US 50 |
| On-ramp | Prairie City |
| Off-ramp | Folsom Ave |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,080 | Volume (vph)* | 470 | Volume (vph)* | 264 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,232 | Volume (pcph) | 475 | Volume (pcph) | 267 |




**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?
   **MPH** and **MPH**
   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) — 51.2
4. Weaving Intensity Factor (k) — 1.00
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ — 1,308
6. 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

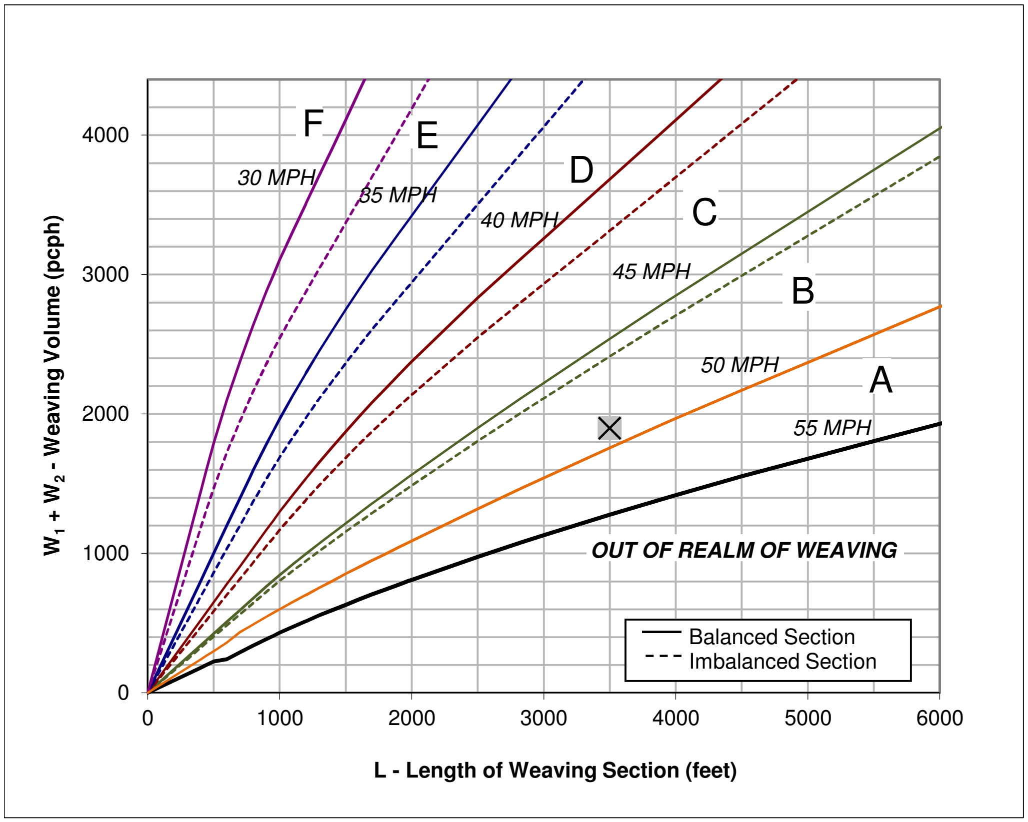
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

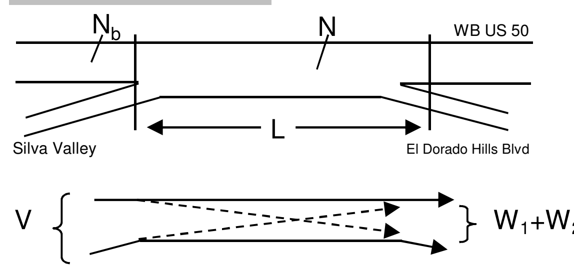
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - AM |
| Freeway | WB US 50 |
| On-ramp | Silva Valley |
| Off-ramp | El Dorado Hills Blvd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 5,460 | Volume (vph)* | 930 | Volume (vph)* | 950 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 5,624 | Volume (pcph) | 939 | Volume (pcph) | 960 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**

   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) 49.1
4. Weaving Intensity Factor (k) 1.34
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ 1,188
6. Level of Service (LOS) B

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

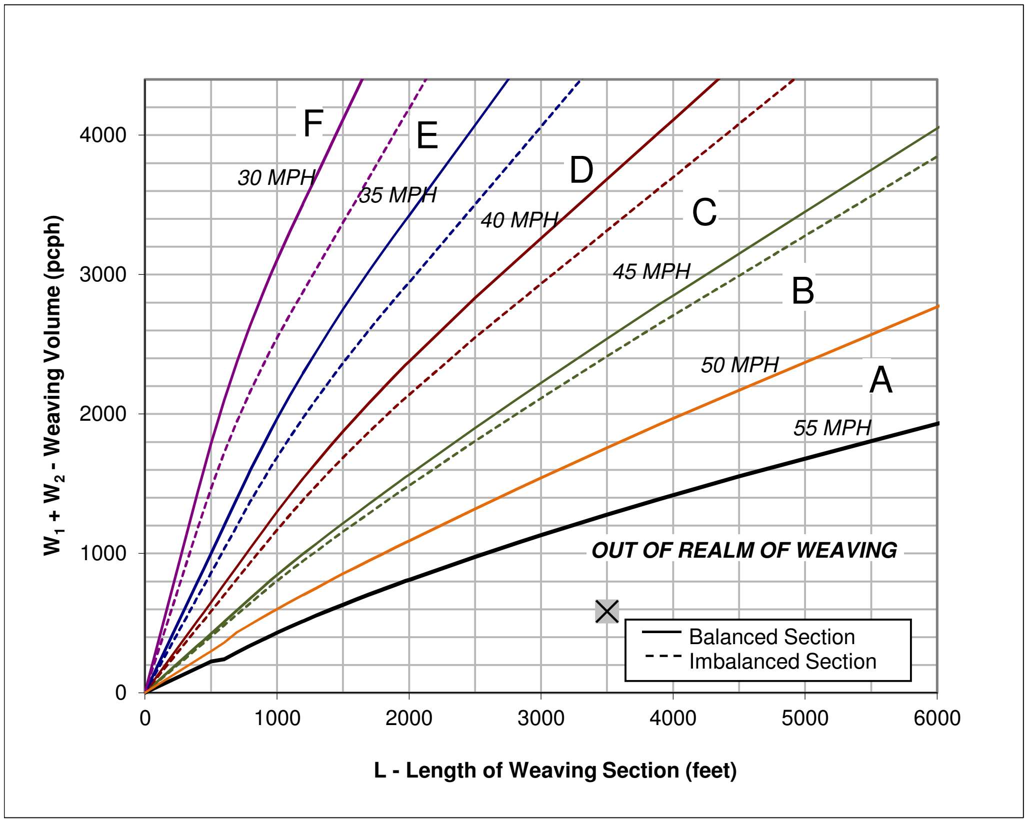
## Data Input

| | | |
|---|---|---|
| Number of Entering Mainline Lanes | $N_b$ | 4 |
| Number of Lanes in Weaving Section | N | 5 |
| Length of Weaving Section (feet) | L | 3,500 |

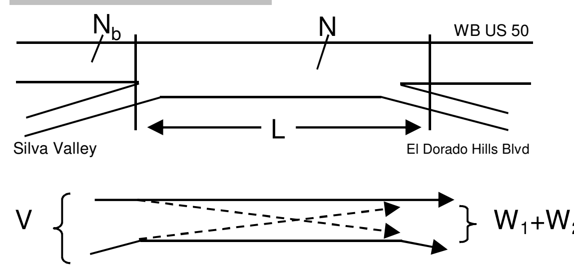
## Project Information

| | |
|---|---|
| Project | Russell Ranch |
| Scenario | Cumulative Plus Project - PM |
| Freeway | WB US 50 |
| On-ramp | Silva Valley |
| Off-ramp | El Dorado Hills Blvd |

| Total Weaving Section (V) | | On-ramp to Mainline ($W_1$) | | Mainline to Off-ramp ($W_2$) | |
|---|---|---|---|---|---|
| Volume (vph)* | 3,420 | Volume (vph)* | 190 | Volume (vph)* | 390 |
| Truck Percentage | 6% | Truck Percentage | 2% | Truck Percentage | 2% |
| PCE for Trucks | 1.5 | PCE for Trucks | 1.5 | PCE for Trucks | 1.5 |
| Volume (pcph) | 3,523 | Volume (pcph) | 192 | Volume (pcph) | 394 |




## Figure




## Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**
   [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?
   **45 MPH** and **50 MPH**
   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) 57.5
4. Weaving Intensity Factor (k) 1.00
5. Service Volume (SV, pcph)
   SV = (1/N)*[V + (k - 1)*min($W_1$, $W_2$)] 705
6. Level of Service (LOS) A

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

FEHR & PEERS

# MEMORANDUM

Date: December 1st, 2014

To: Mark Rackovan, City of Folsom Public Works

From: David Carter, Fehr & Peers

**Subject: Russell Ranch Super Cumulative Comparison**

*RS14-3229*

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This memorandum documents a comparison between projected cumulative year (2035) and "super cumulative" (beyond 2035) traffic volumes on key Sacramento County Roadway segments in the vicinity of the Folsom Plan Area. This comparison relies upon model data from the following two versions of the Sacramento regional travel demand models developed and maintained by Sacramento Area Council of Governments (SACOG):

- SACMET MTP/SCS version modified to include full build-out of the Folsom Plan Area (model used to develop cumulative year traffic forecasts for the Russell Ranch DEIR; please refer to this document for additional information on this model).
- SACSIM MTP/SCS version modified to produce super cumulative forecasts in the joint transportation studies conducted for the four pending master plans in unincorporated Sacramento County (developed by DKS Associates).

The model used to develop the super cumulative scenario for the pending County master plans includes substantially higher levels of land development than included in the year 2035 MTP/SCS projections developed by SACOG, and therefore represents a post-2035 condition. Specifically, the super cumulative version of the model was modified to include full build-out of the below major development projects (e.g., as opposed to a level of development consistent with less than full build-out, as included in the MTP/SCS model):

Unincorporated Sacramento County

- West Jackson Highway Master Plan

- Jackson Township Specific Plan
- NewBridge Specific Plan
- Mather South Specific Plan Amendment
- Vineyard Springs Comprehensive Plan
- North Vineyard Station Specific Plan
- Florin Vineyard Gap Community Plan
- Mather Airport Specific Plan
- Cordova Hills
- Easton
- Glenborough
- East County Quarries

City of Rancho Cordova

- Arboretum
- Suncreek
- Sunridge Ranch
- Rio del Oro
- Westborough

City of Folsom

- Folsom South of 50 Specific Plan

City of Sacramento

- Aspen 1

## RESULTS OF DAILY ROADWAY SEGMENT VOLUME COMPARISON

**Table 1** provides a comparison of daily traffic volumes produced using the Russell Ranch cumulative year (2035) model to the super cumulative volumes. As expected, the super cumulative version of the model that contains substantially higher levels of land uses in Sacramento County results in generally higher roadway segment traffic forecasts. The super cumulative scenario results in daily traffic volumes that are approximately 40% higher than the Cumulative Plus Project scenario based upon the MTP/SCS. Of the six roadway segments evaluated, five out of the six have higher daily volumes in the super cumulative version of the model. The differences between the two models are generally greater to the west of the

Russell Ranch study area (closer to the projects in the unincorporated County) and lower to the east.

| TABLE 1: ROADWAY SEGMENT VOLUME COMPARISON | | | |
|---|---|---|---|
| **Roadway Segment** | **Average Daily Traffic Volume** | | |
| | **Cumulative No Project** | **Cumulative Plus Project** | **Super Cumulative** |
| Grant Line Road – South of White Rock Road | 31,300 | 31,100 | 43,600 |
| Prairie City Road – North of White Rock Road | 16,200 | 16,300 | 24,100 |
| Scott Road – South of White Rock Road | 3,600 | 3,600 | 4,400 |
| White Rock Road – West of Grant Line Road | 7,300 | 7,300 | 18,100 |
| White Rock Road – West of Prairie City Road | 38,400 | 38,200 | 58,900 |
| White Rock Road – West of Empire Ranch Road | 22,500 | 23,600 | 19,900 |

Source: Fehr & Peers, 2014

# MTP/SCS 2035 Update

# Land Use Forecast Background Documentation

# Appendix E-3
# Land Use Forecast Background Documentation

**Table of Contents**

## SACOG 2008 Base Year Update Technical Methodology Summary

SACOG created a year 2008 spatial dataset of estimated land use, employment, and housing conditions for use in the MTP/SCS. The SACOG 2008 existing conditions data is intended to be a "small-area estimate" of land use, housing and employment. One reason SACOG uses a computed estimate of land use, rather than using a parcel-level inventory of actual uses, is because parcel-level inventories of dwelling units and jobs are not available for most of the region. Additionally, the purpose of the 2008 small-area estimates dataset is for creating projections and future land use scenarios and because projections are not set at the parcel-level, this methodology allows for an "apples to apples" comparison between the base year and future year estimates.

The 2008 existing conditions small area dataset consists of three components: 1) an existing housing unit estimate, 2) an existing employment estimate, and 3) existing land use. This memo describes the process SACOG used to create these three pieces of data and how, together, they become an estimate of existing conditions.

### Existing Housing Unit Estimate

SACOG creates a housing unit estimate for existing conditions at the Census block group geography in order get the most accurate estimate of what is on the ground today and where it is located. This is important for creating the future MTP/SCS land use forecast as well as for use in our travel model. SACOG began its small area housing estimate with 2000 Census housing unit data and then added to it parcel level housing permit data collected by SACOG from each jurisdiction from January 1, 2001 through December 31, 2007. Together these two datasets are the first step in developing a Census block group housing estimate current as of January 1, 2008. The housing unit estimates are split into four categories of housing type: single family, multi-family 2-4, multi-family 5+, and mobile homes.

The block group estimates were then aggregated to jurisdiction level and jurisdiction totals compared to the California Department of Finance (DOF) Demographic Research Unit (DRU) E-5 series. Aside from the U.S. Census Bureau's Population Estimates program that tracks housing units by state and county annually, the E-5 Series is the only annually updated data in California that tracks jurisdiction level housing by type. There were some significant differences between the SACOG block group housing unit estimates and the DOF totals, particularly in high growth areas. Much of the discrepancies were likely caused by permit recording errors and in areas where annexations have occurred, as DOF generally takes 1-2 years to reconcile annexations within their dataset. In an effort to reconcile the difference between the SACOG housing estimate and DOF, a number of reviews using GIS data were completed. Using GIS, the block group boundaries were overlaid with aerial photography, parcel-level assessor land use data, and any land use data provided by individual jurisdiction. These data were then reviewed individually by block group literally counting rooftops to adjust our estimate up or down based on what is observed to be on the ground. Because both SACOG and DOF data are estimates, there is still some variation at the jurisdiction level between SACOG's block group based housing estimate and DOF's jurisdictional housing estimate. However, regionally, the SACOG estimate and DOF estimates are within 0.2 percent of each other. County level comparisons of the two data show accuracy between 0.3 percent and 2 percent. With only a few exceptions, jurisdiction level summaries were accurate within 5 percent, and most are even closer than that.

### Existing Employment Estimate

In addition to needing small area estimates of housing units, SACOG also needs to create small areas estimates of existing employment to inform the MTP/SCS land use forecast and the regional travel model. To estimate employment in the region, SACOG purchased 2008 point level employment data from InfoUSA. This data comes with employment sector information based on the North American Industry Classification System (NAICS). Because of the very large number of NAICS employment sectors, SACOG created 24 employment sectors to categorize all the NAICS sectors and effectively generalize the data into a more manageable data set.

While the InfoUSA data is one of the more comprehensive and detailed employment datasets available, it requires some review and edits to be as accurate as possible. This data contains many duplicate records and has some specific sectors of employment for which the data is incomplete or lacking. These areas included primarily state and local government data, schools, and farming/agricultural production facilities. To remove the duplicates, the data were visually reviewed and adjusted accordingly. Supplemental data from a variety of sources, including state and local government data, California Department of Education school site data, and the Sacramento Business Journal Book of Lists, were reviewed and added as necessary. The final data were then aggregated at Census block group to arrive at a total jobs estimate for 2008. Because there are not many agencies that track total employment, across all sectors, there are few other data sources by which we can compare the SACOG employment estimates. The State Employment Development Department, for example, tracks county-level employment estimates only, and excludes public sector employment, and sole proprietors, from its estimates.

**Existing Land Use**

To create the 2008 existing land use estimate, SACOG started with its 2005 existing land use dataset and modified it with a number of more recent data sources, including local government inventories (where available), assessor land use data and aerial photography. In combination with the housing permit and employment data sets referenced above, these data sources were used to update SACOG's spatial estimate of existing land uses. SACOG uses about two dozen general land use categories in its land use estimate. In other words, while actual uses on the ground might have hundreds of different specific land uses (e.g., car wash, coffee shop, convenience store or single-family home, duplex, mobile home) SACOG has more general categories (e.g., neighborhood retail or medium density residential). The geography of this data is a "split" parcel file. Parcels were the base geography, but then, depending on parcel size and location, they were split (into halves, quarters, etc.) to facilitate more accurate modeling of future conditions in the development of the MTP/SCS land use forecast.

**Existing Conditions**
**(Housing Unit Estimate + Employment Estimate + Existing Land Use)**

Once the parcel level existing land use data were updated to the year 2008, the data are put into I-PLACE3S to estimate housing and employment totals at a parcel level. The foundation for I-PLACE3S is its "place types" or land uses. These user defined place types are set up to include assumptions about the land use (e.g., parking ratios, landscape setbacks, building square footage, etc.). SACOG uses place types created to correspond with the general land uses used in the existing land use inventory, described above. Once defined, each residential place type has a maximum density (dwelling units per acre) and each non-residential place type has a maximum intensity (employees per acre and floor area ratio). Once the 2008 existing land use parcel file is put into I-PLACE3S and place types are assigned, housing and employment estimates will be calculated using these maximum density and intensity factors, unless adjusted by the user. For example, a two acre parcel with a low density land use (maximum density of 8 units per acre) will result in 16 housing units on that parcel. However, this can be adjusted by the user. Real world development is not as simple as twenty four land uses, all built at maximum allowed densities, so SACOG calibrates these totals to the block group estimates of housing unit and employee totals described above. A few simplified examples are noted below to illustrate this process:

| Census Block Group | Total Housing Unit and/or Employment Estimate | Parcel File Land Uses | Outcome Modeled in I-PLACE3S |
|---|---|---|---|
| Block Group A | 100 single family housing units | 100 parcels with "low density" land uses | 100 low density parcels with one unit per parcel |
| Block Group B | 50 single family housing units and 200 multi-family units | 50 parcels with "low density" land uses and 2 parcels with "high density" land use | 50 low density parcels with one unit per parcel and two high density parcels with 100 units each |
| Block Group C | 2,000 office employees and 500 retail employees | 10 parcels with "regional commercial" land uses and 50 parcels with "neighborhood commercial" land uses | 10 regional commercial parcels with 41.6 employees each and 50 neighborhood commercial parcels with 41.6 employees each |

Once completed, this data is summarized and vetted with each jurisdiction's planning department. Land use maps with jurisdiction wide housing and employment summaries were sent to each agency for review. In some cases, more detailed summaries or GIS files were also shared. Adjustments on both the land uses and the housing and employment estimates were made based on comments received.

The result of this process is estimates of housing units and employment for small areas within the region. In order to use I-PLACE3S, each developed parcel is assigned a place type and a housing and/or employment estimate, but it is not our intention that these data be used at a parcel-level. As noted above, these data are calibrated in I-PLACE3S to match control totals of housing units and jobs by Census block group. This means that on any given parcel, the estimate may not match the exact use at that parcel; however, if a number of parcels are added up to a larger area (e.g. census block group or greater), the estimates should closely match the mix of uses on the ground in 2008. Note that for employment estimates, the discrepancy between the parcel-level estimate and the actual use of the parcel will vary more, in general, than the estimates of dwelling units. This is due to several factors. First, employment at a given parcel varies by season, changes in the economy, factors related to specific industries, and individual factors related to specific employers. For example, the total number of jobs at a multi-tenant office building on a single parcel will most likely change year to year based on natural turnover of tenants and economic and other factors. Housing units, once built, generally remain in place from year to year.

**Method for Developing MTP Update Growth Projections**
Draft – June 25, 2010

1. **PURPOSE:** This describes the general framework SACOG will use to develop the land use component, or growth pattern, for the next Metropolitan Transportation Plan (MTP). The update to the MTP is expected to be adopted by the SACOG Board no later than December 2011. Every MTP contains a description of the expected growth pattern for the years covered by the plan. This update cycle, the land use issues will be especially influenced by SACOG's new draft growth projections for the region and the requirements of SB 375. This memo may be refined and expanded as the process moves forward. SACOG wants to be as transparent as possible in this process.

2. **REGIONAL GROWTH PROJECTIONS:** SACOG typically updates its growth projections on four-year cycles. For the last few cycles, SACOG has contracted with The Center for the Continuing Study of the California Economy (CCSCE) to lead this work. Under the leadership of its Director, Stephen Levy, CCSCE prepares draft projections of future employment (by major employment sector), population and household growth at the six-county regional scale. This draft information is reviewed by the SACOG staff and Board, member cities and counties, and stakeholders, and is ultimately adopted by the SACOG Board. Demographic projections (e.g., household size, age, income) are included and used by SACOG to estimate demand for new housing units.

The four-year update cycle is largely driven by federal Clean Air Act requirements, which require Metropolitan Planning Organizations such as SACOG to update regional transportation plans at least every four years to demonstrate compliance with federal regulations affecting regions not currently in attainment with federal standards for all criteria pollutants (i.e., pollutants regulated by the Clean Air Act). SACOG may amend its plan whenever it chooses, so long as its amended plan continues to demonstrate "conformity" with Clean Air Act requirements.

The time period covered by SACOG's MTP must be at least 20 years. Because SACOG typically updates the MTP every four years it chooses to have a minimum time period of 24 years on the date it is adopted. Sometimes a longer period is used. When SACOG adopted its current MTP in 2008, it purposely chose a time horizon of 2035 so that the same horizon year could be used in the 2011 update cycle.

3. **ALLOCATION OF REGIONAL GROWTH PROJECTIONS THROUGHOUT THE REGION:** In each MTP update cycle SACOG also prepares an estimated growth pattern for the region (i.e., where throughout the region the projected amount of employment and housing will occur during the planning period). This process has always been governed by federal requirements related to regional transportation plans and the Clean Air Act (23 CFR part 450 and 40 CFR part 93). This MTP update will also be affected by SB 375, and specifically its requirements to include a Sustainable Communities Strategy (SCS), and possibly an Alternative Planning Strategy (APS), and to document and analyze the effects of the SCS on several natural resources. (Gov. Code, § 65080, subd. (b)(F)(2)(B)).

SACOG considers a number of factors in developing the estimated growth pattern. Existing public policies and regulations are important. Local general plans, spheres of influence, community and specific plans, land division and development codes, and design guidelines affect the type and intensity of future land uses. State and federal policies and regulations also are considered, most notably (but not limited to) those relating to development in floodplains and other natural hazard areas (e.g., fire), federal Clean Water Act and Endangered Species Act permit requirements, Transportation Control Measures in air quality plans under the Federal Clean Air Act, and state housing requirements.

While local, state and federal policies and regulations have a strong influence on the estimated growth pattern, it is more accurate to state that they are the start, not the end, of the process. There are many reasons for this, but essentially the sum of all those policies and regulations never yields a growth pattern exactly consistent with the projected amount of employment and housing growth for the entire region. For example, the sum of retail-designated lands typically exceeds forecasted quantities. The time horizon of general plans seldom exactly match the time horizon for an MTP. All of these plans and regulations are also likely to change many times throughout the 24-year planning horizon of the MTP. So assuming that they are, in effect, frozen for two or more decades on the date the MTP is adopted is not likely to be accurate.

Many other factors are therefore documented, analyzed and considered in creating the growth forecast. These sometimes include an estimate of the direction and magnitude of future changes to the policy and regulatory environment. If a major local general plan update is in process but not yet adopted, SACOG may consider the probable substance of the updated plan in addition to the currently adopted plan. Market and economic considerations are also analyzed. Practical considerations affecting the cost and timing of providing infrastructure (e.g., water, sewer, transportation) are analyzed. Market considerations are also analyzed, such as people's interest in different types of housing and developers'/builders' ability to deliver that housing at prices people can afford. Future demographic trends (i.e., percentage of households with children, older heads of households, etc.) are an important part of this analysis.

The policy priorities for the transportation funds covered by the MTP also influence the projected future growth pattern. Through the last two MTP updates, the overall policy priorities for SACOG funds and the establishment of specific programs reflect a commitment to support Blueprint principles. One early example of this commitment is through the Community Design Grant program SACOG established six years ago to incentivize development projects that support Blueprint implementation. During this period of increasing SACOG Board support for linking Blueprint principles to the MTP, a trend towards performance-based outcomes linking integrated land use and transportation decisions has become increasingly evident in federal and state transportation policies and investment priorities.

Through its MTP and short-term funding decisions for transportation projects, SACOG emphasizes high performance in reducing vehicle miles traveled, increasing transit, walk and bike, and high-occupancy vehicle mode shares, and reducing congestion at key bottlenecks. These transportation infrastructure investments will have some influence on shaping the future growth pattern.

Taken together, SACOG estimates to the best of its ability what the future growth pattern is likely to be. It is a process that includes consideration of many variables.

In addition to estimating a 2035 growth pattern, SACOG also must estimate growth phasing for several near-term years: 2011, 2014, 2017, 2018 and 2025 under Federal Clean Air requirements, and 2020 under SB 375. Because SB 375 requires SACOG's Regional Housing Needs Allocation (RHNA) to be consistent with the new SCS, it must also estimate a growth pattern for the next RHNA horizon year (to be determined by the California Department of Housing and Community Development). All of the considerations that affect the 2035 growth forecast are also addressed for these interim year forecasts, including transportation infrastructure. Under federal and state law, SACOG is required to create and maintain a Metropolitan Transportation Improvement Program (MTIP). The MTIP covers a four or five year period, and is governed by fairly stringent rules that require SACOG to prove that funds are reliably available in the near term to construct projects in the MTIP. To the extent that transportation projects in the MTIP have strong influences on shaping growth, this can be an important factor in these interim growth forecasts. Federal rules also require the entire MTP, out to the year 2035 in this cycle, to be financially constrained. However, the federal government interprets the financial constraint requirements most strictly in the earlier years, especially during those years until transportation and air quality modeling indicates the region will attain federal clean air standards.

Three land use and transportation scenarios will be developed during the summer of 2010 utilizing the factors listed above. The scenarios will be evaluated with a set of performance measures that are based on the legislative actions listed here, plus other measures that are important to staff, stakeholders, and the SACOG Board. The performance metrics from these scenarios are an opportunity to learn some strengths and weaknesses of the growth allocations that are part of the scenarios. The learning process is another factor that will be used to allocate growth for the draft plan, the SCS, and possibly the APS.

4. **MTP AMENDMENTS AND CONSISTENCY ISSUES:** In part because SACOG's MTP growth forecast can never be just the sum of its 28-member local governments' adopted general plans at any given point in time, the question often arises, "what are the implications for a land use project that is not shown in the MTP growth forecast"? Several issues must be considered in answering this question. The most important answer is that cities and counties have land use authority, and that nothing in the MTP alters that fact. So, for example, if a city has a general plan with a 50-year planning horizon, it would not be surprising if the MTP2035 growth forecast only indicated growth on a portion of the land designated in the city's general plan for future growth. The reverse may also be true. The MTP2035 growth forecast may show growth in areas that are not yet formally included in a county's or city's general plan if SACOG estimates there is market demand for growth in that location and the entitlement process is underway and is projected to be successfully completed.

Including growth within the MTP is not a guarantee it will happen, and growth that is not included in the MTP does not mean that SACOG has any authority to prohibit that growth from occurring. It is also important to remember that MTPs are updated on a federally controlled cycle of at least every four years. This means that if new information about individual development projects, for instance, becomes available after an MTP is adopted, SACOG is obligated to address that information in the next MTP update cycle. The planning work for the next update cycle typically starts approximately two years after the current MTP is updated.

There are at least two other issues to consider when analyzing the effect of SACOG's growth forecast. First, the growth forecast does have a significant effect on the content, phasing, and performance of the transportation system improvements in the MTP, which are designed to best serve the projected growth pattern. To the extent that growth not identified in the MTP is approved by local jurisdictions, transportation improvements in the MTP may need to be rescheduled or phased, modified in form, or otherwise changed. Changes and amendments to the MTP, and the programming documents which are based on the MTP, must comply with the federal Clean Air Act, California Environmental Quality Act (CEQA), and other regulations, which may limit the ability to adapt quickly to unforeseen growth. Second, SB 375 also provides CEQA benefits to certain housing and mixed-use projects that are consistent with either an SCS or APS that meets the greenhouse gas emissions reduction target that will be established by the California Air Resources Board by September 30 of this year. But this is a carrot, not a stick. In other words, there is nothing explicit in SB 375 that changes how CEQA applies to projects that are inconsistent with the SCS or APS. SACOG will be publishing more information in the future regarding this consistency determination for activating the CEQA benefits in SB 375.

5. **GROWTH ALLOCATION AND SCENARIO DEVELOPMENT:** The first effort to allocate the regional growth to subareas within the region, and to develop packages of transportation projects which support the growth, will take place this summer and fall. Three MTP scenarios, combining different allocations of growth and packages of transportation projects, will be developed and evaluated over the summer. The results will be reported to the region in a series of public workshops in the fall. The basic concept for creating unique land use and transportation scenarios was discussed at the May SACOG committee meetings and the June SACOG Board meeting. The draft preferred scenario for the MTP will be generated in part through evaluation and public comment on the results of the scenarios.

As approved by the SACOG Board in June, the three scenarios will vary on the land use side by:

- Varying the amount of compact development—compact development has been shown to be more effectively served by transit, to support potentially higher rates of walking and biking, and to generate lower vehicle travel.
- Varying the amount of development in high-quality transit corridors, where residents are more likely to use available transit.
- Varying the amount of complementary, mixed-use development, which supports shorter vehicle trip making, and higher rates of non-motorized travel.

Three key dimensions by which the transportation alternatives will vary are:

- The location, intensity, and type of transit service, based on the extent of transit supportive land uses in corridors. Higher density, mixed-use corridors provide greater opportunities for higher capacity transit, such as light rail and streetcars.
- Varying the amount, location, and type of investment in complete streets projects, which serve multiple users in locations where land use generates a mix of travel modes.
- Varying the extent and location of roadway and other projects to alleviate major bottlenecks and congestion points. One dimension by which the scenarios will differ in this regard is the extent to which investments are made to alleviate existing bottlenecks, compared to reserving investments for future bottlenecks.
- Varying the level of investment in Blueprint supportive programs and transportation systems management (TSM) strategies, including technology and demand management programs, that allow for greater optimization of existing transportation infrastructure. More compact and mixed-use development patterns can allow some shifts in investment priorities away from road extensions and expansions to improving the function of existing roads for multi-modal travel.

The three scenarios will seek that fine line between analyzing truly distinctive alternatives, but only within the broad bounds of the type of land development and transportation investments that could realistically be expected to occur over a 24 year period. This concept is easier to describe in concept than to execute in detail. Some examples that hopefully will add clarity:

- The Base Case land use pattern from the original Blueprint will not be included as a scenario because market, policy and demographic trends strongly indicate the housing industry has moved permanently away from large lot, single family as a dominant product.
- Some development projects that have been planned for a long time, and were assumed for at least partial absorption in the currently adopted MTP, may not be included in all of the scenarios. Some may not be included in any of the scenarios. This MTP will have 160,000 few dwelling units and 200,000 fewer employees than the current one. New projects, especially large master planned communities not included in the current MTP, will have a very high bar to meet to demonstrate feasibility for inclusion.
- There are market, policy and demographic trends towards transit-oriented development. The CEQA reform in SB 375 gives the region the option to reduce the time, cost and uncertainty associated with transit-oriented development, thus presumably increasing its potential market share. But there are limits in this development category, too. There is little value in creating a scenario that assumes all or nearly all future growth will occur in this manner, or that the transit-oriented development that does occur will be at such high densities that market acceptance in the Sacramento region is unlikely.
- For each scenario there will likely be transportation investments in the current MTP that are scaled back (i.e., fewer lanes, shorter distances) or eliminated due to the smaller growth footprint and/or reduced revenues projected through 2035. As explained earlier in this memo, this does not necessarily imply that the projects will never be built, or that they are unimportant for the region. It does mean that given the growth and financial parameters of this MTP cycle that the projects are not as high performing as the projects included in the scenarios. The Board may also decide to include some projects in an alternative, or vision, scenario to designate them as a high priority to add to the MTP if additional revenues are identified.

Finally, the exclusion of a development project or transportation project from all scenarios does not definitively mean it will be excluded from the final MTP. SACOG will continue to gather new information over the next several months before the draft preferred MTP takes shape, which should occur towards the end of 2010 and early 2011. If new information leads to the conclusion that the three scenarios did not accurately bound the possibilities for the next MTP, there will still be an opportunity to address that
in the final preferred scenario. It does not seem likely this will occur in many cases, but it certainly is a possibility. And as soon as this MTP is adopted in December 2011, SACOG will begin the process of creating the next one, which will be adopted four years later. It will have a time horizon of at least 2039, and possibly longer.

**Approve Framework for Development of a Draft Preferred Scenario for the Metropolitan Transportation Plan**
Excerpt from December 9, 2010 Board Agenda Item

**Issue:** Staff seeks Board direction for developing a Draft Preferred Scenario in the next phase of the Metropolitan Transportation Plan (MTP) 2035 update.

**Recommendation:** The Transportation Committee recommends that the Board direct staff to develop a Draft Preferred Scenario that is based on MTP workshop Scenario 3 with elements of Scenario 2 and that the process of scenario development include further technical research and work with local agencies to reflect the recent planning assumptions.

**Committee Action/Discussion:** Using the broad themes from the public workshop results, staff created a framework for developing a draft preferred MTP scenario that reflects the preference of MTP workshop participants in four counties for Scenario 3 and the preference in two counties for Scenario 2. Under this framework, a draft scenario would perform between Scenarios 2 and 3. Attachment 1 is the MTP Scenarios "Score Card" from the public workshops which describes the differences between the 3 scenarios. Staff has added comments to some of the key metrics to articulate the nuances of Scenario 3.

*Key scenario features to compare:* The tables below describe the three scenarios in terms of their major transportation and land use characteristics. Scenario 1 represents the adopted MTP updated to a new growth forecast and revenue assumptions and Scenarios 2 and 3 are incrementally different from Scenario 1.

| **Transportation Inputs (total in billions of dollars)** | | | |
|---|---|---|---|
| Share of funding in… | Scenario #1 | Scenario #2 | Scenario #3 |
| Transit | $10.7 | $11.7 | $13.7 |
| Road, bike, pedestrian maintenance & operations | 10.9 | 11.0 | 11.0 |
| New road capacity | 8.7 | 8.0 | 6.7 |
| Bike & pedestrian street and trail improvements | 2.8 | 2.9 | 3.0 |
| Programs | 1.5 | 1.6 | 1.7 |

| **Land Use Inputs (in percent of new homes)** | | | |
|---|---|---|---|
| Share of growth in… | Scenario #1 | Scenario #2 | Scenario #3 |
| Center & Corridor Communities | 19% | 28% | 37% |
| Established Communities | 27% | 24% | 23% |
| Developing Communities | 50% | 45% | 38% |
| Rural Residential Communities | 4% | 3% | 2% |

| | | | | | |
|---|---|---|---|---|---|
| Regional Scenarios Score Card<br><br>Description of MTP Scenarios 1, 2 and 3 | | | | | |
| | Land Use Inputs | Scenario #1 | Scenario #2 | Scenario #3 | Staff Comments on Scenario 3 |
| 1 | Share of growth in Center & Corridor Communities *(percent of new homes)* | 19% | 28% | 37% | Center & Corridor Communities receive their highest share of growth in Scenario 3. In terms of total homes (existing plus new growth), Centers & Corridors represent 17% of all housing. |
| 2 | Share of growth in Established Communities *(percent of new homes)* | 27% | 24% | 23% | |
| 3 | Share of growth in Developing Communities (percent of new homes) | 50% | 45% | 38% | |
| 4 | Share of growth in Rural Residential Communities *(percent of new homes)* | 4% | 3% | 2% | |
| 5 | Share of growth in large-lot single-family homes *(percent)* | 39% | 33% | 25% | |
| 6 | Share of growth in small-lot, single-family homes *(percent)* | 30% | 26% | 23% | |
| 7 | Share of growth in attached homes *(percent)* | 31% | 42% | 52% | Half of all new homes are attached in Scenario 3 |
| | Transportation Inputs | Scenario #1 | Scenario #2 | Scenario #3 | Staff Comments on Scenario 3 |
| 8 | New or expanded roads *(lane miles, percent increase from 2008)* | 25% | 24% | 14% | Greater share of projects aimed at alleviating existing bottleneck locations in the currently urbanized areas compared to future bottlenecks projected in new or developing communities. |
| 9 | Transit service *(Vehicle Service Hours, percent increases from 2008)* | 50% | 85% | 122% | Transit scaled to support the different levels of development around the region. |
| 10 | Funding for transit *($ in billions)* | $10.7 | $11.7 | $13.7 | Highest level of investment in new transit service, including higher frequency bus, street car, light rail, intercity rail, intercity bus, and community shuttles. |
| 11 | Funding for road, bike and pedestrian maintenance *($ in billions)* | $10.9 | $11 | $11 | Higher levels of rural complete corridor investment to support rural mobility, including higher levels of investment in road rehabilitation and operational improvements to make rural corridors safer and support farm-to-market travel. |
| 12 | Funding for new road capacity | $8.7 | $8 | $6.7 | |

| | | | | | |
|---|---|---|---|---|---|
| | *($ in billions)* | | | | |
| 13 | Funding for bike and pedestrian street and trail improvements<br>*($ in billions)* | $2.8 | $2.9 | $3.0 | |
| 14 | Additional miles of bicycle paths, lanes and routes<br>*(Class 1, 2 and 3 = 1,700 in 2008)* | 800 | 1,100 | 1,300 | |
| 15 | Funding for Programs<br>*($ in billions)* | $1.5 | $1.6 | $1.7 | Highest level of funding for Blueprint-supportive programs. |

**Framework for a Draft Preferred MTP2035 Update Scenario**

To direct the next steps of the Metropolitan Transportation Plan 2035 update, staff proposes use of the following framework for a Draft Preferred Scenario. The framework for the Committee's consideration includes two sections:

I. The Conceptual Basis of the Draft Preferred Scenario
II. The Process for Developing a Draft Preferred Scenario

This framework is anticipated to lead to a preferred scenario that reflects the priorities that arose from the public outreach to date (MTP workshops and focus groups), the majority of comments received from agency stakeholders, and the knowledge gained from SACOG technical analysis.

**I. Conceptual Basis of the Preferred Scenario**
Development of the MTP workshop scenarios reflected SACOG staff technical analysis and collaboration with agency partners to develop three distinct scenarios. The workshop framework, adopted by the SACOG Board in June 2010, is summarized in the following matrix:

| Scenario Name | Land Use | Transit | Local Streets Ped/Bike | Bridges and Freeways |
|---|---|---|---|---|
| 1 | ▪ Compact housing share = 61% (same as 2008 MTP)<br>▪ Compared to MTP: Smallest share of growth in TPAs of the 3 scenarios | ▪ Emphasis on shuttles, commuter bus, fixed route bus<br>▪ BRT, street car and LRT where density/mix supports it | ▪ Complete streets opportunities in new growth areas<br>▪ Some opportunity for complete streets "remodeling"<br>▪ Conventional street widening for bottlenecks | ▪ Balance of projects between existing and future bottlenecks |
| 2 | ▪ Compact housing share = 68%<br>▪ More growth in TPAs than #1 | ▪ More opportunities for higher frequency bus and street car | ▪ Similar to #1<br>▪ More opportunities for complete streets | ▪ Emphasis on existing bottlenecks |
| 3 | ▪ Higher share of growth in TPAs<br>▪ TPA more focused in location, higher density – more transit-oriented development | ▪ More opportunities for streetcar and LRT, and other rail services | ▪ More opportunities for complete streets<br>▪ Greater reliance on ITS/management | ▪ Greater emphasis on existing bottlenecks and urban core |

The three workshop scenarios were a second round of scenario building. They were based on several more general scenarios than were built through the spring and early summer to support the setting of greenhouse gas emissions targets by the California Air Resources Board under SB375. The preparation of a draft preferred scenario represents the third round of scenario building. It will naturally evolve from the prior work, with more extensive input from our members and partner agencies, and more refined technical work to try to ensure that it is both realistic to implement and also produces strong performance benefits.

The performance measures presented to the public during the nine public workshops in October showed some performance advantages of Scenario 3. Workshop participants in large majorities selected Scenario 3 as their preferred scenario, with notable variations in Sutter and Placer Counties, where there was more support for Scenario 2. Staff will begin the preparation of the draft preferred scenario from the foundation of Scenario 3, but expect there to be substantial blending of all three scenarios, and refinements that may not have been in included in any of the scenarios, as this next phase evolves.

SACOG staff has had a month to review both the technical and public preference results from the nine workshops. A partial list of issues staff believes need further technical and process work with our members and partners in the next few months include:

1. Integrating Scenario 2 in Placer and Sutter Counties with Scenario 3 in the balance of the region.
2. More detailed analysis of the land use patterns and transportation investments in the centers and corridors. For land use, this means rechecking General Plans, Community Plans and other local policies; market economics; and consumer demand to be clear-eyed about both the opportunities and constraints. For transportation, this means further scrutiny of the types of transit, walking, biking, and complete streets investments that would be needed to support the revitalization of these areas. Staff will look for realistic opportunities to increase the complete streets funding beyond the level in Scenario 3. The associated HUD grant is specifically targeted at this work and should help us target the areas with the greatest potential.
3. Big picture re-check of expected demand for various housing products, especially attached units. Staff will update expected demand for rental-versus-ownership products to determine whether it is expected to be any higher going forward than staff has projected in the past preliminary data indicate this may be the case.
4. Begin to focus on the 2020 land use allocations since this timeframe more closely matches the timeframe for the state's Regional Housing Needs Allocation requirements. The workshop scenarios focused on 2035 performance.
5. Re-check subregional job-housing balance issues, with particular attention on those portions of the region outside of the three major employment centers that are striving to increase their jobs base to achieve a better balance.
6. Re-check and finalize the draft growth projections in May 2011 after the California Department of Finance releases its final growth estimates for the SACOG region.
7. SB375 requires determining when housing/mixed use projects are "consistent" with the MTP. Staff is working on a definition of consistency that will strive to preserve some measure of flexibility in the market. For example, if the MTP projects that 50 percent of Greenfield X will be built out by 2035, staff may define "consistent" as anything within the full (100 percent) build out of that development. Likewise, in Centers and Corridors: If the MTP estimates 250 new housing units will be built near Light Rail Station Y, staff probably would define "consistent" as a higher number of housing units built there, so long as they are consistent with local plans and other performance guidelines. Staff thinks the consistency definition may be the key to preserving market

flexibility, honoring local land use authority, and meeting the performance imperatives of the MTP.

8. For all of the transportation investments, refine the assumptions regarding expected revenues to ensure they are realistic. Transit operations and road maintenance will receive special attention, since both rely in the current plan on new revenues in Sacramento County by 2012 that are not likely to occur.
9. For the transportation investments, the corollary to realistic revenue projections is "right-sizing" the projects. There probably will not be many projects in the current MTP that are eliminated entirely, but several may need to be refined (e.g., number of lanes of new road capacity, length of new carpool lanes) to fit the need and budget. The timing, equipment and frequency of service for the region's largest transit investment, providing rail to the airport, will be examined with this "right-sizing" principle.
10. Particular attention will be placed on congestion issues to ensure that optimum investments are being made with scarce resources to resolve existing and future bottlenecks.

In the big picture, much of this next level of work will be trying to answer the question whether it is realistic to attain the transit benefits of Scenario 3 in the draft preferred scenario. The Board directed staff to ensure that Scenario 3 delivered a better transit performance than the current MTP or the Blueprint. Scenario 3 met that test. The next few months, with substantial support from the HUD grant, will give us the time to confirm whether the performance benefits in that scenario can be delivered through a plan that meets federal, state, and local feasibility standards.

**II. The Process for Developing a Draft Preferred Scenario**

Attachment 4-C identifies key MTP milestones in the months ahead that support the presentation of a draft preferred scenario by fall 2011 that:

- reflect the priorities from the SACOG Board provided through regular briefings and workshops;
- reflect input received from public outreach and engagement with agency stakeholders; and
- reflect knowledge gathered from SACOG technical analysis.

Major tasks to be completed over the next few months to successfully translate the key elements of Scenarios 2 and 3 into a single, high performing Draft Preferred Scenario include the following:

(1) Working with land use agency stakeholders to ensure the land use allocation meets all federal requirements and relates to adopted and proposed local land use plans, regulatory factors that affect the shape or timing of development, and the influence of the market through changing demographics and economics. This effort will include working with local and partner agency staff to develop land use assumptions for the draft preferred scenario that reflect an analysis of real-world conditions including the following:

- Complete "reality checks" of various jobs and housing inputs, including the actual housing market demand in different subareas of the region; job market detail for different subareas of the region; and the relationship of growth projections to adopted and proposed land use plans

- Develop a definition of consistency with the land use projections (i.e., Sustainable Communities Strategy) for the purposes of activating SB 375 CEQA streamlining benefits. A consistency definition needs to maintain flexibility for the market to act but should also be benchmarked to MTP policies and investments.

(2) Working with transportation agency stakeholders to ensure the transportation project list

meets all federal requirements including financial constraint and the most recent planning assumptions. A central effort related to this will be a call for projects review process to receive greater detail on proposed projects. The workshop scenarios focused on budget category building blocks and modeled (capacity) projects. The call for projects review process will offer more detail on operations and maintenance improvements that are presently described in lump-sum budget categories. Other transportation inquiries include the following:

- Examine the pedestrian and bicycling investments of Scenarios 2 and 3 to determine if there are additional enhancements that could be made.

- Conduct "stress-tests" of the workshop scenarios to determine weak or strong points to refine, such as changes to income or gas price assumptions that may impact travel demand and performance metrics.

One of the initial staff efforts that reflects the collaborative processes described above is an analysis of the Centers and Corridors Communities that were popular in the workshops and offer significant performance promise. Optimization of these areas was a defining trait of Scenario 3. A consistent message from the nine workshops was support for the higher share of new growth and supportive transportation investments that would be accommodated in the Centers and Corridors by the horizon year of 2035.

Based on the support for the concept of realizing vital Centers and Corridors across the region, and local agency plans to revitalize many of these Centers and Corridors, staff has begun the process to further analyze the opportunities and challenges in directing a higher share of future growth to these areas by 2035. SACOG collaboration with stakeholders over the next few months will include refinements to the proposed transportation projects in these areas and a more detailed review of the new growth assumptions for each Center and Corridor included in the Draft Preferred Scenario. The following schedule for local agency and stakeholder input identifies the advisory committee meetings that will focus on the development of the Draft Preferred Scenario:

<table>
<tr><td colspan="3">January 2011-May 2011: SACOG staff will<br>1) work with local agencies through advisory committees on elements of draft preferred scenario<br>2) solicit jurisdiction input individually on land use growth assumptions and transportation call for project review projects</td></tr>
<tr><th>MTP Element</th><th>Advisory Committee</th><th>2011 Advisory Committee Meeting Dates</th></tr>
<tr><td rowspan="4">Transportation project list</td><td>Regional Planning Partnership</td><td>Jan. 26, Feb. 23, Mar. 23 (Apr. 27 and May 25 as needed)</td></tr>
<tr><td>Transit Coordinating Committee</td><td>(Dates to be confirmed)</td></tr>
<tr><td>Bicycle and Pedestrian Advisory Committee</td><td>Jan. 27 (Apr. 28 as needed)</td></tr>
<tr><td>Public Works Coordination Group</td><td>(Dates to be confirmed)</td></tr>
</table>

| | | |
|---|---|---|
| **Land use allocation** | Planners Committee, Regional Planning Partnership | Jan. 27, Feb. 24, Mar. 24 (Apr. 28 and May 26 as needed) |
| By June 2011: Preliminary Draft MTP | | |
| November 2011: Environmental impact analysis of Draft MTP completed | | |
| November/December 2011: Draft MTP and EIR released for public comment | | |

## Jurisdictional 2035 Growth Allocation Technical Methodology Summary

### Background and Framework

This memo is intended to accompany the "MTP Methodology Memo" and the "Framework for Development of a Draft Preferred Scenario". Together those two documents describe the general framework used to develop the MTP/SCS Land Use Forecast. The purpose of this document is to provide specific information about how the jurisdiction level growth allocations were completed for the MTP/SCS Land Use Forecast.

### Creating Jurisdiction Growth Estimates

SACOG's process for creating a land use allocation begins with creating housing and employment growth estimates by jurisdiction. The following is a description of how SACOG created the 2035 housing units and employee estimates for each jurisdiction in the MTP/SCS.

First, a database was created of all the numerical data considerations available and relevant to each jurisdiction. This data is not intended to be definitive; it is simply useful information that is considered as part of the analytical process that leads to the jurisdictional growth estimates. This includes jurisdiction level summaries of:

- Base line data
  - Total number of housing units and employees today (2008)
  - Jobs/Housing ratio today (2008)
  - Percent of regional growth share for housing units and employees today (2008)
- Historic reference data
  - Five year and ten year historic residential building permit average
  - Percent of regional five year and ten year residential permits
  - An extrapolation of the five year and ten year building permit averages to estimate 2008-2035 housing unit growth if those past trends defined the future using those two averages
  - Historic county-level employment estimates from State of California Employment Development Department
- Capacity data
  - General Plan and specific plan capacity for housing units and employees
  - How close existing housing units and employees are to reaching the capacity estimate (how close the jurisdiction is to build out today)

- Current MTP data
    - Housing units and employees assumed in the last MTP
    - Regional share of growth of housing units and employees in the last MTP
    - Job/Housing ratio in the last MTP
    - An estimate of housing unit and employee growth using the updated regional growth forecast and each jurisdiction's regional percent share from the last MTP

Next, for each jurisdiction SACOG gathers and considers a number of other data and factors that are not quantifiable in a spreadsheet. This information came primarily from local government planning staff at each jurisdiction at the beginning of the MTP/SCS update. Between December 2009 and January 2011, SACOG staff met with each jurisdiction's planning staff individually to collect maps, project descriptions, shapefiles, and general planning related status updates. The agenda from these meetings is included as Attachment 1. Again this data is not intended to be conclusive by itself; it is part of the information gathered and considered in the process of creating jurisdictional growth estimates. In summary, the information considered included:

- What are the greenfield (Developing Communities) and/or infill opportunities (Center and Corridor and Established Communities) in and around the jurisdiction
    - For specific plans:
        - Is the plan approved; and what levels of approval does it have
        - If approved, what type of infrastructure needs to be built to support the development (wastewater treatment plant, water conveyance, etc).
        - Has construction started on the site
        - Are there other specific plans in the area and their entitlement status
        - Are there natural resource issues to consider
        - Have there been any recent plan amendments or upzoning
- General Plan land use policies
    - When was the plan adopted
    - Is the plan currently being updated
    - Are there development agreements to consider
    - What are the land uses, densities, and intensities allowed
    - Are there policies about mixed-use and/or redevelopment

    - Are there policies about jobs-housing balance
    - Are there agricultural preservation policies
- Are there major job centers in or near the jurisdiction (existing or proposed)
- How strong is the current residential market in the jurisdiction's market area
- Are there major infrastructure or natural resource constraints to building (such as water/sewer capacity, flooding, habitat issues, etc)
- Proximity to transit
- Existing housing and employment vacancies
- Redevelopment and/or under-utilized parcel opportunities

Using all the data and information above, SACOG creates a preliminary draft estimate of housing and employment growth for each jurisdiction. The process and the resulting preliminary draft growth estimate consider each jurisdiction individually. However, our growth projections are created for the region, so each jurisdiction must also be considered as a share of the regional economy. To do this, the preliminary jurisdiction growth estimate is analyzed and adjusted to achieve the regional projections for housing and employment growth, by considering the following:

- What is the jurisdiction's share of regional housing and employment today compared to what it will be in the future and what is the basis for the changes
- How quickly or slowly the jurisdiction has grown in the past, relatively to the regional average growth rate and relative to other jurisdictions in the same market area and/or of a similar size
    - How might adopted and proposed plans change the jurisdictions growth rate from past trends
- What is the amount of growth assumed in the market area
- What is the jobs/housing ratio today compared to what it is for the estimated growth and for 2035

The MTP/SCS land use forecast is bounded by SACOG's regional growth forecast of 303,000 new homes and 361,000 new jobs through 2035. Creating jurisdictional growth estimates that match the region's growth forecast is an iterative process involving the above steps. Once preliminary housing and employment growth "targets" are set for all jurisdictions, they are then modeled in I-PLACE3S.

To better describe the process for creating the jurisdiction growth estimates, below are some generalities that cover many of the jurisdictions in the region for this MTP/SCS planning cycle; however, any information on unique factors relating to a single jurisdiction that SACOG was aware of were considered as well. Regulatory policies, market influences, and building constraints such as flood or infrastructure issues all may result in exceptions to these generalities.

- Jurisdictions that are close to build out today (i.e. have mostly small infill opportunities with no proposed specific plans and/or have specific plan communities that are already more than 50 percent built) are likely to build out by 2035

- Jurisdictions with large existing job centers, or jurisdictions in close proximity to the existing regional job centers, are likely to get a higher proportion of new jobs and housing by 2035

- Jurisdictions that are close to build out today (not in 2035) and have development proposed in their currently adopted sphere of influence, are likely to annex and projects are expected to start begin construction during the planning period

- Jurisdictions with large amounts of general plan capacity in rural residential areas see low growth rates for rural residential development

- Specific plan areas that are currently building are expected to continue to build at rates that are roughly similar to historical averages for the area- inclusive of pre-recession years

- Most specific plans that are approved today, but are not currently building are likely to start construction (but not complete construction) by 2035
  - The rate at which specific plans are assumed to develop is based on a number of factors, including: projected construction of other new specific plans in the area, jurisdiction's growth rate, natural resource constraints (primarily the timing of receiving federal permits), timing and magnitude of infrastructure needed, housing demand in the area and for the planned product type, and a number of development related issues (such as no active developer, litigation issues, etc.)

- Specific plans or proposed projects that are not currently adopted and potentially have natural resource and/or potentially significant infrastructure issues to resolve and/or have questions about market demand in that sub-area of the region are generally not assumed to start building by 2035 and are therefore not in the MTP/SCS

**Modeling the Preliminary Draft Growth Estimates**

The primary reasons for modeling the preliminary allocation in I-PLACE3S are to 1) be able to account spatially for the estimated growth, which makes it possible to make further refinements if needed and, 2) to provide the ability to vet all preliminary assumptions with local jurisdictions in an easily understandable format.

I-PLACE3S is a tool for developing and comparing land use scenarios; by itself, it is not a projections or forecasting tool. SACOG uses I-PLACE3S to spatially allocate development to jurisdictions by subareas (which are defined by local planning areas) to reach the jurisdictional estimates developed according to the process described above. SACOG builds up the jurisdiction land use forecast of housing and employment using the information from land use plans and policies from local general plans, special plans, specific plans, and master plans (adopted and proposed), natural resource constraints, market trends, and the framework adopted by the SACOG Board to make assumptions about the type and location of land uses in each jurisdiction. This 'bottoms-up' allocation is then compared to the jurisdiction targets development according to the process discussed above. If the resulting I-PLACE3S jurisdiction land use allocation does not match the jurisdiction target of housing and employment growth, both sets of numbers are then analyzed to determine whether one, or both, should be adjusted. The allocation process is thus, an iterative process to achieve a land use forecast that reflects the regional growth forecast.

Once the forecast is modeled in I-PLACE3S, the forecast can be visually displayed in a number of ways and can also be tallied and summarized by different geographies. For the MTP/SCS land use forecast, SACOG primarily summarized and displayed the dataset using the MTP/SCS Community Types. More information on I-PLACE3S, including a User Guide, can be found on the SACOG website at: http://sacog.org/services/I-PLACE3S/

**Vetting the Draft Land Use Forecast**

This preliminary forecast was then sent to planning staff at each jurisdiction in the region for review and comment. The information was provided in a table format showing housing and employment estimates for 2008, 2035, and build out at the Community Type level. A Community Type map was provided as well. If other summaries, maps, or individual data files were requested, they were also provided. After receiving comments and feedback from the jurisdictions, SACOG used the new information provided as well as all the data and considerations outlined earlier in this document, to determine if proposed refinements should be made to the forecast. A change in one jurisdiction can affect growth assumptions elsewhere in the region so when refinements are proposed, all jurisdictions are re-analyzed to determine whether or not the refinements should be made and where other refinements may be required in order to maintain the regional growth totals of 303,000 new housing units and 361,000 new employees. Then, again, the revised information was circulated to local jurisdiction planning staff for review. Throughout the MTP/SCS process, SACOG conducted five comment periods directed specifically to local planning staff at various stages of the project, with many additional opportunities for review and comment through the regularly scheduled monthly Planners Committee meetings and individual meetings or phone calls as requested by jurisdiction staff. The various review periods are summarized below and the staff reports that went to each jurisdiction as part of these review periods are included in Attachments 2, 3, and 4.

- May 2010-June 2010- Requested review of 2008 existing conditions (land use map with 2008 housing and employment estimates)
- July 2010-August 2010- Requested review of three draft MTP/SCS land use scenario for use in public workshops (land use maps with 2008, 2035 and build out housing and employment estimates)
- December 2010-Janurary 2011- Requested review of Preliminary Draft Preferred Assumptions (Scenario 2 or 3 housing and employment estimates as a base starting assumption, build out estimates, Community Type map, draft framework)
- April 2011- SACOG hosted six county level meetings to discuss the RHNA factors (these meetings provided a refresh of the information gathering meetings SACOG held in December

2010; new information was used to complete edits to the 2035 land use forecast and were considered in creating the 2020 land use forecast)

- April 2011-May 2011- Requested review of 2035 Preliminary Draft Preferred Scenario (Community Type map, housing and employment estimates for 2008, 2035, and build out, and the 2035 transportation project list)
- July 2011-August 2011- Requested review of 2020 Draft Preferred Scenario (Community Type map and housing and employment estimates for 2008, 2020, 2035, and build out)

**Creating the 2020 Land Use Forecast**

The starting point for the 2020 MTP/SCS land use allocation is the 2035 MTP/SCS including all the assumptions that SACOG developed in coordination with local agency planning staff and that the SACOG Board endorsed in June 2011.

SACOG's 2020 projections for regional housing and employment growth project that the region starts to recover from the current recession sometime before 2020. This assumption is an underlying assumption in all jurisdictions' 2020 forecasts. Regionally, 39 percent of the housing growth and 28 percent of the employment growth in 2035 is projected to occur by 2020. Most jurisdictions do not grow at a constant rate from 2008 to 2035 so each jurisdiction's unique planning and development circumstance must be considered to determine whether its growth is likely to happen faster or slower (i.e. more of its growth between 2008 and 2020 or more of it between 2020 and 2035). However, given that the regional growth forecast for 2020 through 2035 accounts for the majority of the growth in the MTP/SCS planning period, it is not reasonable in most cases to assume that a jurisdiction would receive less than 20 percent of its 2035 housing and employment growth by 2020. The iterative process described earlier in this memo was used to create jurisdiction level growth estimates of the 2008 to 2020 planning period. The process for creating the 2020 growth forecast was defined by the longer-term 2035 growth rate; in other words, the 2020 growth forecast of a jurisdiction and the region as a whole, must be consistent with the location and rate of growth defined in the 2035 forecast. Because the 2020 forecast was built within the framework of the 2035 growth forecast, which was vetted through local jurisdictions and endorsed by the SACOG Board, only one local agency comment period was conducted for the 2020 forecast.

**Attachment 1:**
**Agenda from December 2009-January 2010 Individual Jurisdiction Meetings**

1. MTP overview
    a. Requirements of transportation assumptions
    b. Requirements of land use assumptions

2. Method for creating the land use forecast
    a. Base year of existing housing, employment, land use
    b. Regional population, housing, employment forecast
    c. Planning assumptions used to develop land use forecast (local policies, market performance, regulatory and environmental influences)

3. Existing Conditions Data:
    a. Do you have any existing land use inventory?

4. Trend Data: We use development trend data to help us develop the growth rate for each jurisdiction. We are also look to your observations of local land development and planning for an assessment growth rate.
    a. What is your assessment of the local development market in housing?
    b. Retail and other employment?
    c. What is you assessment of development activity in infill, redevelopment, greenfield areas, SOI (if applicable)?
    d. Are you revisiting impact fees?
    e. Are there any significant plans or projects in process that we should know about? Do you have any absorption studies associated with these?
    f. Are there any environmental or regulatory processes or constraints (e.g. HCPs, flood control) that we should be aware of that influence planning and development activity in your jurisdiction?

5. Plan Data:
    a. We have collected the proposed general plan land uses from your GIS/Planning department.
    b. Are we missing any data?

6. Data SACOG will be reviewing as part of MTP forecast development:
    a. information provided by each jurisdiction,
    b. market research information on employment and housing,
    c. environmental and regulatory constraints where applicable,
    d. 2035 MTP and Blueprint assumptions,
    e. regional economic forecast from Levy
    f. Any data that we acquire will be shared through the planners committee

7. Draft time line for MTP update:

    - January 2010: Receive updated regional growth forecast
    - Mid 2010: Begin creating land use forecasts
    - March 2010: Updated Financial Plan

- March 2010: Submit proposed greenhouse gas emission target to CARB
- May 2010-April 2011: Conduct public involvement process for new MTP
- Sept 2010: CARB issues SACOG greenhouse emissions target
- September 2011: HCD issues SACOG Regional Housing Needs Determination (regional allocation)
- December 2011: MTP target adoption date (could be adopted as late as March 2012)
- May 2012: Final RHNA Plan (or adopted 6 months after Draft RHNA is released)
- May 2013: Housing Elements by Cities/Counties Due to HCD (or due one year after adoption of RHNA; could be as late as September 2013, depending on the adoption date of the MTP)

8. There will be CEQA streamlining opportunities as a part of the next MTP. One path will allow the environmental documents for certain residential and mixed-use projects to tier off of the MTP environmental analysis. A second path will allow for negative declaration of evidence of substantial impact for areas that are located within a half mile of a high quality transit stop or corridor. Has your jurisdiction looked into this process in any planning efforts? Are there areas we should be aware of where these transit definitions might apply?

9. Other matters

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Attachment 2

December 9, 2010

**To:** City and County Planning Directors

**From:** Kacey Lizon and Jennifer Hargrove

**Subject:** Growth allocation assumptions for the Preferred MTP Scenario

SACOG will begin preparation of the draft preferred MTP scenario from the foundation of Scenario 3 (Scenario 2 in Sutter and Placer counties) in an effort to create a preferred scenario that performs in between Scenario 2 and Scenario 3 regionally. Although the preferred scenario will start from Scenario 3, it will ultimately be a blending of all three scenarios and refinements that may not have been in included in any of the scenarios. This will be based on the information we receive from local agencies as well as ongoing market and demographic research conducted by SACOG.

## Local Government Review of Land use Assumptions

To start developing the land use assumptions for the preferred scenario, we have prepared a table of the growth assumptions in Scenario 3 (Scenario 2 in Sutter and Placer counties) that we would like your agency's review and comment on. Local government input is critical to developing the land use assumptions because the growth allocation for the MTP/SCS must meet federal requirements, that is, reflect the growth pattern that is mostly likely to occur, based on the best information available.

The attached table shows the amount of new housing and employment allocated to each of the four community types in each jurisdiction. In the case of developing communities, these are further detailed by specific plan areas. Some specific plan areas received no growth in Scenario 3 (Scenario 2 in Sutter and Placer); these are listed and noted as such.

In addition to the Scenario 3 growth allocations, the table also includes a holding capacity for these geographies. The holding capacity is based on adopted general or specific plan designations or proposed plan capacity.

**As you review the table, please consider the following questions:**

1) How does the amount of growth in each community type compare to your observation of current development activity and/or entitlement processes underway? For major land use projects in your community, can you provide their updated entitlement status?
2) Have you observed any housing and/or employment (commercial, industrial) market trends in your jurisdiction that supports or contradicts this amount growth? If so, please describe those trends.

3) Are there any environmental or regulatory factors to consider that would affect timing or location of development? (e.g. status of federal permits)
4) For specific plan areas, we believe we have the most recent plans reflected in the "Holding Capacity" portion of the table, if you have updated information, please provide that to us. In particular, many specific plans have employment land designated, but do not provide employment estimates. In these areas, we have "No Data" written in the holding capacity. Any employment estimates analyzed or assumed as part of these plans would be helpful.

In your comments, please provide any supportive documentation or updated information that will help us as we draft the preferred scenario. Please respond to Jennifer Hargrove at (916) 340-6216 or jhargrove@sacog.org. Comments will be accepted in any manner that is most convenient (email, phone, meeting, letter, etc.), but all comments must be received no later than Monday, January 17, 2011.

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Attachment 3

April 14, 2011

**To:** City and County Planning Directors
**Cc:** City and County Public Works Directors

**From**: Matt Carpenter, Director of Transportation Services
Kacey Lizon, MTP Project Manager

**Subject:** Land use allocation assumptions for the Preliminary Draft Preferred 2035 MTP/SCS Scenario

Thank you for your ongoing participation in the development of the Metropolitan Transportation Plan and Sustainable Communities Strategy for 2035. Attached for your review and comment is a Preliminary Draft Preferred Scenario for the 2035 MTP/SCS. This memo provides additional information for your review of the scenario.

In December, we asked for each planning department to review the land use assumptions for MTP Scenarios 2 or 3 and provide updated information on development capacity of adopted and/or proposed land use plans, local development trends and other factors that may influence growth over the 25-year MTP planning period. SACOG staff used information received from local agencies, updated demographic, housing, and employment market information, and ongoing technical analysis to create a Preliminary Draft Preferred land use scenario that meets the objectives of the MTP Scenario Framework adopted by the SACOG Board in December. For your quick reference, this Scenario Framework can be found here: http://www.sacog.org/calendar/2010/12/16/board/pdf/11B-MTP%20Scenarios.pdf . The Preliminary Draft Scenario is composed of a transportation project list and land use allocation for each city and county in the region. The preliminary draft land use allocation for your jurisdiction is included in Attachment 1. We are asking for your review and comment on this preliminary draft to help us refine it into a draft preferred scenario. At this halfway point in the MTP update process, we hope the following information is helpful context for your review of the preliminary draft scenario.

## Method for Developing the MTP Land Use Allocation

In each MTP update cycle SACOG prepares an estimated growth pattern for the region (i.e., where throughout the region the projected amount of employment and housing will occur during the planning period). This MTP update is governed by federal requirements related to regional transportation plans and the Clean Air Act (23 CFR part 450 and 40 CFR part 93). It is also affected by SB 375, and specifically its requirements to include a Sustainable Communities Strategy (SCS), and possibly an Alternative Planning Strategy (Gov. Code, § 65080, subd. (b)(F)(2)(B)).

Auburn
Citrus Heights
Colfax
Davis
El Dorado County
Elk Grove
Folsom
Galt
Isleton
Lincoln
Live Oak
Loomis
Marysville
Placer County
Placerville
Rancho Cordova
Rocklin
Roseville
Sacramento
Sacramento County
Sutter County
West Sacramento
Wheatland
Winters
Woodland
Yolo County
Yuba City
Yuba County

Given these requirements, SACOG considers a number of factors in developing the estimated growth pattern. These include:

***Local plans and policies:*** Local general plans, spheres of influence, community and specific plans affect the type and intensity of future land uses. Proposed and pending plan updates are also considered in addition to currently adopted plans.

***Other Regulations and Policies:*** State and federal policies and regulations are considered, most notably (but not limited to) those relating to development in floodplains and other natural hazard areas (e.g., fire), federal Clean Water Act and Endangered Species Act permit requirements, Transportation Control Measures in air quality plans under the Federal Clean Air Act, and state housing requirements.

***Market and economic considerations:*** Practical considerations affecting the cost and timing of providing infrastructure (e.g., water, sewer, transportation) are analyzed. Market considerations are also analyzed, such as the strength of subregional job markets, people's interest in different types of housing, and developers'/builders' ability to deliver that housing at prices people can afford. Future demographic trends (e.g. age of population, household composition, income, etc.) are an important part of this analysis.

For the last few MTP updates, SACOG has contracted with The Center for the Continuing Study of the California Economy (CCSCE) to develop regional projections of population, employment and households. CCSCE prepares draft projections of future employment (by major employment sector), population and household growth at the six-county regional scale. SACOG staff must then allocate that growth to all of the jurisdictions of the region using the three factors described above. The growth pattern of the MTP is controlled to this total amount of population, employment and housing growth for the region.

SACOG's MTP/SCS growth forecast can never be just the sum of its 28-member local governments' adopted general plans because the sum of all those policies and regulations never yields a growth pattern exactly consistent with the projected amount of employment and housing growth for the entire region. For example, the sum of retail-designated lands typically exceeds forecasted quantities. The question often arises, "what are the implications for a land use project that is not shown in the MTP growth forecast"? The short answer is that the land use assumptions in the MTP will not and do not preclude a local jurisdiction from planning and approving growth that is different in terms of total units and/or geographic extent. A longer answer adds on that SACOG must update the MTP/SCS every four years, so that as new information about individual development projects becomes available after the MTP is adopted, SACOG is obligated to address that information in the next MTP update cycle.

**Information to Consider when Reviewing the Land Use Scenario**

Attachment 1 shows the amount of new housing and employment allocated to each of four community types in each jurisdiction, detailed by plan area where applicable. A "Holding Capacity" column is also included in the scenario table so that you can review the base land use assumptions used to develop the scenario. If you believe a plan area to be omitted from the table, it may be that it is included in another geographic category or that no growth is assumed to occur by 2035. Please don't hesitate to contact us with any questions as you review the scenario.

Planning and development conditions change on a regular basis and we understand that there may be new information to consider for any given plan area or project. **Therefore, in addition to any other comments you provide, please consider the following factors as you review the tables:**

1) Has the development status of any planning area changed since January 2011?
2) Have you observed any development market trends or demographic trends in your jurisdiction that are different since January?
3) Have any environmental or regulatory factors changed since January that could affect timing or location of development (e.g. status of federal permits)?
4) Are there any other factors or considerations that may affect the land use allocation for your jurisdiction?

**A note on the 2020 land use allocation:** a 2020 land use allocation for the MTP/SCS will be produced; however, regional growth projections for the 2020 time frame are not yet set, pending growth projection information from the California Departments of Finance and Housing and Community Development.

**To Provide Comments**
Comments will be accepted in any manner that is most convenient (email, phone, meeting, letter, etc.). Please respond to Jennifer Hargrove at (916) 340-6216 or jhargrove@sacog.org by **Thursday, May 5, 2011.**

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Attachment 4

July 18, 2011

**To:** City and County Planning Directors

**From**: Matt Carpenter, Director of Transportation Services
Kacey Lizon, MTP Project Manager
Jennifer Hargrove, Land Use Coordinator

**Subject:** Land use allocation assumptions for the Draft Preferred 2020 MTP/SCS Scenario

Thank you for your ongoing participation in the development of the Metropolitan Transportation Plan and Sustainable Communities Strategy for 2035.

In April, we asked each planning department to review the Preliminary Draft Preferred Scenario for 2035. In June, after jurisdiction comments and other factors were considered, the SACOG Board endorsed the Draft Preferred Scenario for 2035. A copy of the Board item was emailed as part of the June Planners Committee meeting and can also be found here: http://sacog.org/calendar/2011/06/23/planners/pdf/4a_MTP%20Draft%20Pref%20Scenario.pdf

As part of the MTP/SCS for 2035, we have to develop projections and a land use allocation for 2020. Attached for your review and comment is a Draft Preferred Scenario for the 2020 MTP/SCS. The method for developing this 2020 land use allocation builds on the method used to develop the 2035 land use allocation (see Attachment 1 for a description of this method). The 2020 land use allocation for each jurisdiction must represent an interim growth projection between the MTP/SCS base year of 2008 and the end year of 2035.

**Information to Consider when Reviewing the Land Use Scenario**

The draft land use allocation provided below shows the amount of new housing and employment allocated by 2020 to each of four community types in each jurisdiction, detailed by plan area where applicable. The MTP/SCS 2035 Draft Preferred Scenario and the Build Out you reviewed previously are included in the table so that you can review the base land use assumptions used to develop the scenario. If you believe a plan area to be omitted from the table, it may be that it is included in another geographic category or that no growth is assumed to occur by 2035. Please don't hesitate to contact us with any questions as you review the scenario.

Planning and development conditions change on a regular basis and we understand that there may be new information to consider for any given plan area or project. **Therefore, in addition to any other comments you provide, please consider the following factors as you review the tables:**

1) Has the development status of any planning area changed that would affect the near-term (through 2020) timing of development?
2) Have you observed any development market trends or demographic trends in your jurisdiction that would affect the near-term timing of development?
3) Have any environmental or regulatory factors changed since January that could affect the near-term timing or location of development (e.g. status of federal permits)?
4) Are there any other factors or considerations that may affect the 2020 land use allocation for your jurisdiction?

**To Provide Comments**
Comments will be accepted in any manner that is most convenient (email, phone, meeting, letter, etc.). Please respond to Jennifer Hargrove at (916) 340-6216 or jhargrove@sacog.org by **Monday, August 8, 2011.**

The SACOG Board will be asked to endorse the use of a 2020 Draft Preferred Scenario at its September meeting.

## Regional Growth Pattern

As part of the MTP/SCS, SACOG develops a growth forecast, estimating new population, employment, and housing for the region, and a land use forecast, which is the distribution of this growth around the region. The purpose of this document is to describe the general use, density and intensity of the land use forecast for each jurisdiction.

Growth rates and patterns within an area are influenced by various local, regional, and national forces that reflect ongoing social, economic, and technological changes. Ultimately, the amount and location of population growth and economic development that occurs within a specific area is regulated by city and county governments through zoning, land use plans and policies, and decisions regarding development applications. Local government and other regional, state, and federal agencies also make decisions regarding the provision of infrastructure (e.g., transportation facilities, water facilities, sewage facilities) and protection of natural resources that may influence growth rates and the location of future development.

At any point in time, the 28 jurisdictions in the Sacramento Region are at various stages of updating or augmenting their local land use plans. Since the adoption of the Blueprint Vision by the SACOG Board of Directors in December 2004, a number of jurisdictions in the region have been voluntarily implementing the Blueprint smart growth principles into their planning processes. The general plan and specific plan development activities occurring in the region by the local jurisdictions are reflected in the 2035 land use forecast that accompany the population, housing and employment forecasts for the MTP/SCS 2035. These plans fall within one of four categories:

- Recently adopted general plans (Since 2004): City of Citrus Heights, El Dorado County, City of Rancho Cordova, City of Galt, City of Lincoln, City of Live Oak, City of Sacramento, City of Wheatland, Yolo County, Yuba County, Sutter County, and the City of Yuba City.

- Undergoing general plan updates (present): Sacramento County, City of Rocklin, and City of West Sacramento.

- Developing or recently adopted area-specific land use plans: City of Davis, City of Elk Grove, City of Roseville, Placer County, City of Placerville, City of Folsom.

- Not currently updating general plans or community-level land use plans: City of Auburn, City of Colfax, City of Isleton, Town of Loomis, City of Marysville, City of Winters, and City of Woodland.

In developing the MTP/SCS 2035 land use forecast, SACOG worked with each of the local jurisdictions to develop a growth forecast and accompanying land use allocation that reflects each of their Blueprint implementation efforts. At the same time, the MTP/SCS 2035 land use assumptions must reflect the growth pattern that is most likely to occur, based on the best information available (93 C.F.R. § 93.122). The resulting growth patterns are a combination of local policies, many of which reflect or are influenced by Blueprint principles, and market forces leavened by issues such as flooding and habitat conservation.

Definitions for Frequently Utilized Terms

The following terms are used throughout this document to describe the characteristics of the land uses identified in the MTP/SCS.

**General Plan-** California law requires each jurisdiction in the state to develop and adopt a general plan, a long-term plan for the physical development of the city or county. It must contain seven mandated elements, including: Land Use, Open Space, Conservation, Housing, Noise, Circulation, and Safety.

**Specific Plan-** Sometimes referred to as a master plan, community plan, or planned unit development, this is a tool many cities and counties use to implement the general plan in new growth areas. It effectively establishes a link between implementing the policies of the general plan and the development proposal of a specific area.

**Sphere of Influence (SOI)-** A sphere of influence refers to a plan for the probable ultimate physical boundary and service area of a city, as determined by the Local Agency Formation Commission (LAFCO). LAFCOs are state-mandated, quasi-judicial countywide commissions whose function is to oversee boundary changes of cities and special districts, the formation of new agencies, including the incorporation of new cities or districts, and the consolidation of special districts and cities.

**Density-** Housing units divided by net residential acres (land on which housing is built, exclusive of public rights-of-ways, parks, schools and public areas). All densities discussed in this section of the MTP/SCS refer to net density.

**Rural Residential-** Single-family housing that is typically one to two stories, built at a density less than or equal to one unit per acre.

**Very Low Density Residential-** Single-family housing that is typically one to two stories, built at a density between two and four units per acre.

**Low Density Residential-** Single-family housing that is typically one to two stories, built at a density between four and eight units per acre.

**Medium Density Residential-** Single-family or multi-family (attached) housing that is typically built at a density between 9 and 12 units per acre. Typical building heights are one to two stories.

**Medium-High Density Residential-** Single-family or multi-family (attached) housing that is typically built at a density between 13 and 25 units per acre. Typical building heights are one to three stories.

**High Density Residential-** Multi-family (attached) housing that is typically built at a density greater than 25 units per acre. Typical building heights are between two and six stories, with taller buildings in the more urban areas.

**Commercial-** Commercial uses include retail and combined retail and office uses ranging from neighborhood scale to regional scale, generally one to two stories. Up to three stories is allowed when mixed with residential in a vertical mixed use format. Floor Area Ratios (FAR) generally range from 0.2 to 0.6; however, FAR can be up to 2.0 in mixed-use buildings.

**Office-** Office uses include a range of office buildings from single, small office uses (e.g., generally not including office parks or complexes) that range from one to three stories to multi-story towers (20 or more stories). Minimum FAR are generally 0.8.

**Industrial**- Industrial uses range from light industrial-office to heavy industrial. This includes business park complexes, warehouses, manufacturing and processing facilities, and other industrial uses generally ranging from one to two stories. FAR typically are 0.3 or less.

**Public-** Public uses include schools, hospitals, fire stations, airports, military facilities, libraries, community centers, zoos, public pools, etc. FAR are generally about 0.2 to 0.3; however, because of the wide range of public uses, this range can be much larger. For example, universities and hospitals will often have FAR greater than 1.0 and airports, by contrast, are usually very low, at less than 0.05.

**Rural Residential Community**- This refers to the MTP/SCS Community Types. Please see Chapter 3- Land Use Forecast for a full description and map of the Community Types. Residential development forecasted in these areas in the MTP/SCS does not exceed the maximum density of one unit per acre, as defined by general plans. Employment development is based on 80 percent of the allowed intensity of the land use designations in adopted general plans.

**Center and Corridor Community**- This refers to the MTP/SCS Community Types. Please see Chapter 3- Land Use Forecast for a full description and map of the Community Types. Unless otherwise noted, development forecasted in these areas in the MTP/SCS is based on 80 percent of the allowed density or intensity of the land use designations in adopted general plans.

**Established Community-** This refers to the MTP/SCS Community Types. Please see Chapter 3- Land Use Forecast for a full description and map of the Community Types. Unless otherwise noted, development forecasted in these areas in the MTP/SCS is based on 80 percent of the allowed density or intensity of the land use designations in adopted general plans.

**Developing Community-** This refers to the MTP/SCS Community Types. Please see Chapter 3- Land Use Forecast for a full description and map of the Community Types. These areas were modeled according to the adopted and proposed specific plans, master plans, and special plans discussed throughout this document.

## SUMMARY BY JURISDICTION

### EL DORADO COUNTY

#### *Placerville*

Land development in the City of Placerville is significantly limited by topography, as the city is located in a narrow valley surrounded by steep hills. In the past several years, new development has occurred on individual infill sites, resulting in a slow growth rate for the city. As the county seat and a major stop along the tourist routes into the Sierra Nevada foothills and mountains, Placerville has also maintained a relatively strong jobs base in the county. Today the city is more than two-thirds built out and is primarily characterized in the MTP/SCS as an Established Community. The MTP/SCS also designates a Center and Corridor Community along Placerville Drive and Highway 50, in the city limits. This is consistent with the city's Proposed Placerville Redevelopment Plan, which focuses on a reuse and revitalization strategy for the city's western gateway. The proposed plan would allow for redevelopment by authorizing the Redevelopment Agency to use a portion of the property taxes within the project area to improve infrastructure, revitalize property, and facilitate development in accordance with the general plan.

Growth projections through 2035 reflect continued infill of the city's vacant and underutilized parcels, with approximately 1,107 new housing units and 824 new jobs by 2035 in Established Communities and Center and Corridor Communities. These new housing units range from low to medium-high density. The new jobs are primarily commercial in the Center and Corridor Community, with new commercial, office, industrial and public uses in Established Communities. The city's strong jobs-housing ratio of 2.5 currently is expected to move towards a more balanced jobs-to-housing ratio of 2.1 by 2035. Moderate growth in both jobs and housing will occur steadily through the time period, with 2020 growth that is on par with the regional average for housing and employment growth that, at 40 percent of the 2035 employment growth happening by 2020, is slightly higher than the regional average. The build out estimate for the city provides an additional 1,854 new employees and 665 new homes post 2035.

The regional monitoring program will include tracking of the ultimate resolution of the future of redevelopment functions through the courts and state legislature, which may influence the city's plans for revitalization along Placerville Drive.

### *El Dorado (Unincorporated County)*

Residential development is concentrated in the western half of the county and historically has been rural in nature. Commercial development is generally located along Highway 50 and State Routes 49 and 193. In the last decade, robust suburban residential and employment growth has occurred at the county's western edge, in the communities of El Dorado Hills and Cameron Park. Due to the fact that these areas have a significant amount of existing homes and employment areas, Cameron Park, the portion of El Dorado Hills that is west of El Dorado Hills Boulevard, the areas immediately adjacent to Placerville, and the Diamond Springs area are designated as Established Communities in the MTP/SCS. Today, these areas are primarily made up of low density housing and supporting commercial and public uses. The remaining portion of El Dorado Hills, along with the adopted specific plans of Carson Creek, Bass Lake Hills, Valley View, Missouri Flats, and currently proposed Marble Valley make up the Developing Communities in El Dorado. A new El Dorado Hills Business Park south of Highway 50 and just east of the El Dorado-Sacramento County border has begun generating some job growth outside of the traditional jobs center in the city of Placerville. This area is one of two Center and Corridor Communities in the county. The other is located in the Diamond Springs area, along Pleasant Valley Road, between Missouri Flat Road and Highway 49. The county recently adopted a mixed-use ordinance that allows mixed use development of commercial properties, up to 70 percent residential and 30 percent commercial. El Dorado County's general plan focuses the highest concentrations of housing and employment growth in these communities (designated Established and Center and Corridor in the MTP/SCS) while designating the rest of the unincorporated area for rural development and agriculture. The general plan also designates "agricultural districts". The purpose of these areas is to conserve, protect, and maintain agriculture use in these areas. Within these districts, there are stronger policies on non-agricultural development, including providing a ten acre buffer between agricultural related and non-agricultural uses. These areas, along with the eastern half of the county which is primarily forested and publicly owned lands, are designated in the MTP/SCS as lands not identified for development in the MTP/SCS planning period, meaning no non-agricultural related development is projected in these areas. The remaining county is considered Rural Residential Communities, consistent with the county general plan. Although the general plan includes substantial theoretical opportunities for rural residential construction in these areas, market forces, county policies to protect and promote agricultural uses, and wildfire risk issues are expected to significantly limit the amount of actual rural residential development.

The MTP/SCS forecasts 11,715 new housing units and 16,821 new employees in the unincorporated portion of El Dorado County by 2035. The majority of this growth, 6,198 housing units and 14,925 employees, is located in Established Communities. This new housing growth ranges from very low density to medium-high density. Much of this is the continued build out of existing plans. New employment in these communities is a mix of neighborhood supportive commercial and public uses, as well as filling in and expanding existing industrial/office parks along Latrobe Rd., and in various locations along Highway 50.

Developing Communities in the MTP/SCS make up 5,107 of the new housing units and 691 new jobs. The portion of El Dorado Hills that is a Developing Community has approximately 3,500 homes and 1,800 jobs today. The MTP/SCS forecast includes an additional 1,472 new homes and 258 new jobs in this area by 2035; however, planned capacity for this area includes an additional 1,967 employees and 1,064 housing units. The growth in this area is primarily very low density residential, averaging two units per acre with smaller scale neighborhood supporting commercial and new public uses. Bass Lake Hills, immediately adjacent to El Dorado Hills is planned for almost entirely residential uses, has 1,183 new housing units and 57 new employees by 2035. Similar to El Dorado Hills, this area is primarily very low density residential, averaging two units per acre. This area is expected to build very close to its capacity by 2035, with only an additional 82 units of capacity remaining. The Valley View specific plan area, located just south of Highway 50 from El Dorado Hills has a planned capacity for 2,862 housing units and 340 employees. This housing has recently started building and has approximately 300 homes as of 2008. The MTP/SCS forecast assumes construction of another 1,032 homes by 2035 and 132 new jobs. Similar to its surroundings, this area has an average density of three housing units per acre and employment uses that are commercial and public. Carson Creek is a Developing Community located on the Sacramento-El Dorado border, just south of Highway 50, which has begun to develop in recent years. This area is projected to build out its residential capacity in the MTP/SCS planning period, adding 701 new housing units, and averaging about three units per acre. The southernmost portion of this plan is for new industrial uses that have the potential to generate 3,620 new employees at build out. Of this employment growth, 47 new employees are forecast in the MTP/SCS during the 2035 planning period. Missouri Flats, Developing Community just outside of Placerville, has plans to more than double the current 3,239 employees, reaching a potential 6,815 employees at capacity. This area is unique because it is currently more like an Established Community, however, the county has recently adopted design guidelines for the area to encourage revitalization and improve the quality and character of the area. For this reason it is included as a Developing Community. The MTP/SCS assumes only a small amount of housing and employment growth in this area, 197 new employees and 73 new housing units. Revitalization of an existing community often happens slower than new growth due to its location within the region; it is likely that this area will take time beyond the current planning period to realize its full employment capacity. The final Developing Community is Marble Valley. Though not yet adopted, the plan is expected to provide 3,013 new homes and 1,041 new jobs. Because the plan it not yet adopted the MTP/SCS forecast projects only

646 of the new homes will occur by 2035. Because it is a new plan, the average density is expected to be five units per acre, somewhat higher than the surrounding Developing Communities.

Rural Residential Communities in El Dorado County are expected to experience low amounts of growth, approximately 395 new housing units and 770 new jobs by 2035. The MTP/SCS forecast assumes relatively small amounts of new rural residential homes to be constructed in the region by 2035. This is in part due to the current recession combined changing demographics which suggest a higher percent of the population will want to live on smaller lots or in attached homes near existing jobs, services, and with more transportation choices.

Unincorporated El Dorado County as a whole is forecasted to grow in pace with the regional average. This means it will experience slower growth rates between now and 2020 as the region comes out of the current recession. Regionally, 28 percent of the 2035 employment growth is forecasted to occur by 2020 and 39 percent of the housing growth forecasted by 2035. El Dorado County is projected to build 31 percent of its 2035 employment and 39 of the housing by 2020. The jobs-housing ratio in 2035 is forecasted to improve slightly to 0.7, from 0.6 today.

Trends that will be tracked through the regional monitoring program that could influence future land use forecasts in El Dorado County include the rate of increased job growth in the foothills, the degree to which the County's priority of protecting and growing its agricultural activities succeeds, and the pace of rural residential construction.

## PLACER COUNTY

### *Auburn*

Auburn has experienced a slow pace of growth over the past twenty years. Development opportunities within the city are limited to a single greenfield site south of Interstate 80, scattered infill parcels, and redevelopment in the city's redevelopment district. Though it covers a large area, Auburn's sphere of influence (SOI) similarly has few large development parcels outside of the redevelopment potential along the Highway 49 corridor (north of the city limits). Given the nature of existing development in the Auburn area, large, capacity-adding annexations are not projected to occur. For this reason, most of the city and the SOI area are Established Communities in the MTP/SCS. The half mile radius around the existing Amtrak station is a Center and Corridor Community. The greenfield site, south of Interstate 80 has an adopted Specific Plan, known as Baltimore Ravine is a Developing Community in the MTP/SCS. Auburn has historically maintained a strong balance of jobs to housing, due in part to its role as the county seat, a shopping and service destination for the surrounding rural areas, and as a stop along heavily-traveled tourist routes to the Sierra Nevada foothills and mountains.

Auburn's Established Communities are primarily built out today in terms of new residential and employment capacity. These areas have capacity to add approximately 2,000 new housing units; however, this is all through individual infill opportunities at maximum allowed densities and would take significant time to achieve. Given the historic nature of residential growth in Auburn, the MTP/SCS forecast is for 360 new homes in Established Communities by 2035. Similarly these areas have capacity for about 2,100 new employees, but the MTP/SCS forecast is for 636 new employees by 2035. About 208 new employees and 287 new housing units are expected to be added to the Center and Corridor Community around the train station in the MTP/SCS planning period. The remaining growth in the MTP/SCS, 714 new housing units and 63 new employees, is in the Developing Community, Baltimore Ravine. This plan is approved and expected to total 726 housing units with an average density of 10 units per acre and supporting commercial and public uses, generating potentially 200 employees at build out.

Although the ratio of jobs-to-housing units is expected to remain jobs-heavy, it does improve slightly, from 1.4 to 1.3 in 2035. A greater share of the housing growth will occur in the later years of the planning period as it is expected that the housing units in Baltimore Ravine will likely not begin construction right away. Similar to many Developing Communities around the region, it is expected to start building by 2020, with the majority of the development will likely occur between 2021 and 2035. The employment forecast in the MTP/SCS for Auburn is similar to the majority of the region in that it will take time for the job market to recover and so slower job growth is expected in the early years. However, Auburn job growth, because of its strong job base currently, is forecasted to occur a bit faster than the regional average.

Among the factors that will be tracked through the regional monitoring program is the possible interplay between growth on the county's valley floor and growth rates in Auburn. If the expected success of the on-going effort to adopt a habitat conservation plan in this area stalls or fails it is possible that growth pressures may shift up into the foothills and change the projected pace of growth in Auburn. Another factor that could increase Auburn growth rates would be the provision of additional commuter rail service to the city.

### *Colfax*

Colfax is a relatively small city that has experienced historically slow growth. Though the city is not built out, much of the current development has been there for a long time and the city does not have any large new growth areas. For this reason, most of the city is considered an Established Community in the MTP/SCS. The city is currently working on a Highway Corridor Revitalization Plan for the area along Interstate 80 to encourage economic development of the area. This portion of the city is a Center and Corridor Community in the MTP/SCS.

Through 2035, Colfax is anticipated to grow slowly, with 659 new jobs and 180 new housing units by 2035. New development is likely to be small-scale and a significant amount of it concentrated in and around the Interstate 80 and Highway 174 corridors.

Issues that we will track through the regional monitoring program include whether there are any unexpected market dynamics that increase growth rates substantially. The recent resolution of the city's wastewater treatment issues has removed one important impediment to growth.

### *Lincoln*

The City of Lincoln has been one of the fastest growing cities in the Sacramento region for much of the last decade, more than tripling its population in the past ten years. The majority of the growth has been residential development in a few large specific plan areas, though commercial development has accelerated in the three to four years preceding the current recession. As a result of this growth, the residential capacity within the city limits is about 80 percent built out today. For this reason, the entire city limits, with the exception of the downtown area, is an Established Community in the MTP/SCS. The downtown area, because of its location along Highway 65 and its history as being the town center, is distinguished in the MTP/SCS as a Center and Corridor Community. The city's recently adopted 2050 General Plan will accommodate a major expansion of the population and city limits. The Plan was developed at approximately the same time as the Blueprint and the two documents are essentially consistent with each other. The general plan organizes new growth into "villages." There are seven villages, each containing a mixture of land uses and densities designed to implement smart growth principles and to recognize the environmental and physical constraints of each village area. Large commercial, industrial and employment uses are planned for the areas along the nearly completed Highway 65 Bypass. All seven villages are in the city's sphere of influence (SOI). Village 7 has a currently adopted specific plan, while the others do not. Throughout the expansion areas of the city (east and west), a minimum of 45 percent of the land area will be dedicated open space and parklands. As a participant in the Placer County Conservation Plan, Lincoln is working with Placer County and federal and state resource agencies over those lands that will be preserved and developed within its future city limits. It is most likely that Villages 1, 2, and 7 will begin construction within the current MTP/SCS planning period and they are, therefore, designated as Developing Communities. A portion of the current SOI, outside of the Villages, along Highway 65 is designated by the general plan for employment uses, including a medical center and light industrial uses. This area is also a Developing Community in the MTP/SCS.

The MTP/SCS forecasts 11,275 new housing units and 9,963 new employees in Lincoln by 2035. About 4,000 of the new housing units are in the Center and Corridor Community and Established Communities. This growth ranges from very low density to medium-high density and is assumed to build out the residential capacity of the current city limits. Employment growth in Established Communities accounts for 4,754 of the new employees, which includes commercial, office, industrial, and public land uses. Within the Established Communities there still exists additional land capacity for another 5,800 employees.

The Developing Community that is located along Highway 65, currently in the SOI area of the city, includes 4,229 new employees by 2035 in the MTP/SCS forecast. This area is designated by the general plan for employment only and, therefore, no housing growth is assumed for this area in the MTP/SCS. This area has capacity beyond the MTP/SCS forecast for an additional 5,557 new jobs. Village 7 is the first of the Villages assumed to begin construction. As a result, the MTP/SCS forecasts this specific plan area will likely build out its 3,298 housing units and 395 employees by 2035. This village includes an average residential density of ten units per acre with neighborhood serving commercial and public uses. Villages 1 and 2 make up the remaining growth for the city. Village 1 has a capacity of 3,524 housing units and 676 employees. The MTP/SCS forecasts 2,010 new housing units and 275 employees by 2035. The average residential density is seven units per acre and the plan includes neighborhood serving commercial and public uses. Developing Community, Village 2, includes 1,997 new units and 235 new employees in the MTP/SCS. However, this village is planned for a capacity of 3,901 housing units and 352 employees. Similar to the other villages, Village 2 includes neighborhood serving commercial and public uses, and has an average residential density of eight units per acre.

While Lincoln has experienced rapid growth in the early part of the decade, the current recession, high foreclosure rates, and changing demographics are likely to contribute to a slower housing growth rate for the city that is on par with the regional average rather than significantly higher than it. Close to the regional average of 39 percent, the MTP/SCS forecast assumes 38 percent of the 2035 housing growth will occur by 2020. Much of this growth is expected to occur in the existing city limits, in Established Communities, with the build out of currently developing subdivisions. Lincoln is projected to experience increased job growth into the future as it merges with the growing southwest Placer job center along the Highway 65 corridor. The completion of the Highway 65 Bypass also contributes to the higher percentage of jobs in the city. By 2020, the MTP/SCS forecasts approximately 37 percent of the 2035 jobs will be realized, compared to the regional average of 28 percent. Because of the employment growth expected to occur in the city, housing development in Village 7 is forecasted to begin by 2020 as well. This growth forecast works to improve the city's jobs-housing ratio from 0.5 today to 0.7 by 2035.

There are at least three key variables to monitor carefully that may influence the timing and nature of growth in Lincoln in future MTP/SCS updates. First, the Lincoln Bypass, a major investment whose first phase is well under construction and expected to be completed in 2012. Second, the timing of completion of the Placer County Conservation Plan, which currently appears to be on a positive trajectory headed towards resolution; however, challenging issues remain including some involving lands within the Lincoln SOI. Third, Placer County has started an informal discussion about the pros and cons of designating cities as the primary entities responsible for urbanizing lands in southwest Placer County. Any one of these three variables could alter market conditions enough to warrant changes in future MTP/SCS's.

### *Loomis*

The Town of Loomis is a small, rural community that has experienced very little growth in the past seven years despite its location in the fast-growing southwestern region of Placer County. Loomis' general plan aims to maintain the town's rural character overall, while the Town Center Master Plan supports some infill and redevelopment in the downtown area. Because of this, the Town Center area is a Center and Corridor Community in the MTP/SCS, while the housing and industrial employment areas bordering it are characterized as Established Community and the remaining portions of the city are Rural Residential Community.

Loomis' projected MTP/SCS growth of 947 new employees and 938 new housing units by 2035 is expected to happen slowly over the planning period and primarily in the Center and Corridor Community and Established Community. This growth is consistent with the general plan allowed uses and densities in these areas. With no plans for expansion, the town's residential growth is limited to development of the remaining vacant rural residential lands, and minimal development in its downtown. Employment growth will be concentrated along the Interstate 80 corridor and in the downtown. Residential growth will be slow, with the town only likely to see 20 percent of its 2035 housing growth by 2020. The town's strong existing jobs-housing balance is expected to be maintained through 2035.

The regional monitoring program will include tracking the fate of funding for urban infill development such as envisioned in the town's core area, and the potential impact any additional commuter train service in Placer County might have on growth rates and patterns in and around Loomis.

### *Rocklin*

The City of Rocklin is surrounded on all sides by the cities of Lincoln and Roseville, the Town of Loomis, and the Roseville SOI. The city experienced significant residential growth prior to the current recession and as a result, today the city is about 75 percent built out in its housing capacity. The city is currently completing a general plan update, which assumes build out of the city residential uses by 2035 using the city's mid-range growth projections. As part of the general plan update (in progress), the city is incorporating its Conceptual Downtown Rocklin Plan that will provide significant capacity for residential and employment growth in the downtown area. The Downtown Plan area is located within the half mile radius of the existing Amtrak station. This entire area is a Center and Corridor Community in the MTP/SCS. The city has four new growth areas, two residential focused and two employment focuses within the city. These areas are Developing Communities in the MTP, while the remainder of the city is considered an Established Community.

These four Developing Communities represent the next increment of significant new growth in the city. Sunset Ranchos is an adopted specific plan area that has begun building in recent years. At build out the plan will include a total of 4,339 housing units and 1,944 jobs. With an average residential density of eight units per acre, this area is primarily low and medium density uses with some neighborhood supporting commercial and public uses. Directly west of Sunset Ranchos, along Highway 65 is the city's newest employment center. Though building activity has just started, this area could accommodate up to 13,473 employees at build out and is primarily made up of commercial, office, and light industrial uses. The second employment only Developing Community in Rocklin is along Interstate 80. At build out, this area could potentially add 3,347 new employees to the city. The fourth and final Developing Community in Rocklin is the Clover Valley Specific Plan area. Clover Valley is planned for 564 low density units, averaging four units per acre and some small commercial and public uses.

Similar to the general plan update projections, the MTP/SCS forecast for Rocklin is that most of the city's residential capacity will be built by 2035. The city's employment centers are expected to grow significantly by 2035, but will not likely reach its capacity for some time beyond the MTP/SCS planning period. By 2035, the MTP/SCS forecast for the city includes 6,358 new housing units and 9,128 new jobs. About 85 percent of this housing growth will occur by almost building out the two residential Developing Communities and by building out existing subdivisions and infill in Established Communities. The Center and Corridor Community is expected to grow by 975 housing units and 418 employees. This residential growth is expected to be higher density and will be added through small-scale infill and redevelopment and, therefore, is expected to be implemented slowly over the MTP/SCS planning period. Due to past development trends, when current economic conditions improve as projects in the MTP/SCS land use forecast by 2035, Rocklin along with the rest of southwest Placer County, is anticipated to be one of the first areas in the region where recovery in both residential construction and employment growth will occur. As a result, Rocklin's job and housing growth is expected to outpace the regional average. The MTP/SCS forecasts 43 percent of the 2035 employment growth forecast by 2020, compared to the regional average of 28 percent of the 2035 employment growth by 2020, will occur in Rocklin. These estimates are more in line with the city's mid-range growth projections in the general plan update as compared to the low-range growth that has actually been experienced over the last several years.

The regional monitoring program will include tracking the resolution of local government redevelopment authorities as well as any potential changes in market trends in this area once the region comes out of the recession and many of the planned development in the southwest Placer area begin to build.

### *Roseville*

Roseville sits at the heart of the southwest Placer employment center. In the past decade, the city experienced significant housing growth; however housing growth still did not keep pace with employment. Employment uses have been concentrated in the areas around Interstate 80 and Highway 65. While residential uses surround these areas, the majority of the city's housing is located west of the Interstate 80/Highway 65 corridors. With the exception of the West Roseville specific plan area, the city's residential capacity is about 88 percent built out. For this reason, most of the city is considered Established Communities in the MTP/SCS. Roseville has three Center and Corridor Communities. The first includes the half mile radius around the existing Amtrak station, including the Downtown Specific Plan and Riverside Gateway areas. The second two are centered on the Sunrise Boulevard and Douglas Boulevard intersection, and correspond with two of the city's primary future target infill and revitalization areas. The West Roseville specific plan, adopted in 2004, began construction of homes in 2006. Since adoption of the plan, landowners have applied for rezones to increase the capacity and density of the plan. While this area has about 1,200 homes today, it has capacity for an additional 7,626 and for this reason it is a Developing Community in the MTP/SCS.  Two other Developing Communities are identified for development during the MTP/SCs planning period: Sierra Vista and Creekview. Sierra Vista is a recently adopted specific plan, also recently annexed into the southwestern city limits. The city has an existing Memorandum of Understanding (MOU) with the US Fish and Wildlife Service, which enables early consultation with federal resources agencies. Creekview, within the city's northwest SOI is currently in the entitlement process. An existing MOU developed in 2000 with Placer County designated Roseville as the lead agency to plan the urbanization of both the Sierra Vista and Creekview planning areas. The city has one additional new growth area it is considering at this time, which is located just north of the Creekview specific plan, outside of the current SOI area. Because a development application was only submitted in May 2011 and is anticipated to take several years to process, it is not considered for development in this MTP/SCS planning period.

With 28,480 new jobs and 18,162 new housing units, job growth is expected to outpace housing growth through 2035 in Roseville. About 65 percent of the job growth is forecasted to occur in Established Communities. This is primarily through filling in existing employment areas, including regional retail centers, office parks/light industrial complexes, and industrial parks. These Established Communities have land capacity for an additional 10,690 new employees. Residential growth capacity in these Established Communities is much smaller as much of it is small, infill development. The MTP/SCS forecasts 3,179 new housing units in these areas by 2035. The majority of the new housing growth is in Developing Communities. The West Roseville area is assumed to build out its planned 8,845 housing units, at an average of seven units per acre, by 2035.  This area also has plans for new commercial and office uses, which could result in 3,342 new employees at build out. The MTP/SCS forecasts 2,618 of the new employees by 2035. Sierra Vista is also projected to reach close to its build out potential by 2035. With 6,100 new housing units and 4,797 new jobs by 2035, the MTP/SCS forecast is nearing the 6,650 new homes and 5,382 new jobs in the plan's build out capacity. Housing growth in this area will range from low to high density, with an average density of 10 units per acre. Employment uses include commercial and neighborhood supporting public uses. The remaining Developing Community, Creekview, is assumed to start building later in the planning period than Sierra Vista and is forecasted to build a little more than one-quarter of its 2,011 housing unit capacity by 2035. This area is mostly medium density residential, with an average density of 11 units per acre. It includes some neighborhood supportive commercial and public uses, generating 380 new employees in the MTP/SCS, with capacity for an additional 38. Unlike Established Communities, which experience high employment growth relative to housing growth, Developing Communities experience high housing growth relative to employment growth. This is due to two factors: (1) most of the residential growth in Developing Communities is not expected to fully build out by the horizon year of the MTP/SCS and, therefore, a critical mass of housing is not present to support planned employment growth; and (2) most Developing Communities are located around existing regional jobs centers in southwest Placer County, southeastern Sacramento County, and urbanized Yolo County and are intended to provide nearby housing for those jobs centers.

Job growth in Roseville is somewhat slower in the early years of the plan compared to historic trends, but is expected to keep pace with residential development and outpace the regional average for growth by 2020. With approximately 9,800 new employees and 9,700 new housing units by 2020, the city is forecasted to get 34 percent of its 2035 job growth and 53 percent of its 2035 housing growth by 2020. Over three-quarters of this jobs growth is expected in the existing job centers in Established Communities. Most of the housing growth in the early years, by 2020, is in the West Roseville and Sierra Vista areas. Redevelopment and infill, both mixed-use and residential, in the Center and Corridor Communities are forecasted to be slow and steady throughout the planning period. These Center and Corridor Communities are forecast for 696 new housing units and 2,178 new employees in the MTP/SCS planning period. Build out potential in these areas is significant, 14,697 additional employees and 823 additional housing units. With other large established employment centers in the city, it is unlikely that these areas will reach their employment capacity for some time, well beyond the current MTP/SCS planning period.

There are several on-going planning initiatives which may influence the growth projected for Roseville in future amendments to the MTP/SCS, including new, linked discussions between the City and Placer County regarding the possibility that Roseville may become a part of the PCCP, and that the county may decide to ask the cities in southwest Placer County to be the local governments with primary responsibility for future urbanization decisions. Either or both of these, as well as other dynamic planning issues in the city, could result in changed conditions that warrant refinements to some of the assumptions on which this land use forecast is based.

### *Placer (Unincorporated County)*

Historically, development in unincorporated Placer County was concentrated in rural communities, the majority of which are clustered along the Interstate 80 corridor. The MTP/SCS describes these areas as Rural Residential Communities. Clusters of more concentrated housing and employment are located near more urban areas of the county. The areas immediately surrounding the cities of Auburn and Colfax, as well as Granite Bay, and the Sunset Industrial area are all examples of this. These areas are characterized as Established Communities. In the past several years, Placer County has approved a number of new specific plans, which will allow significant new residential and employment growth in the county. Because these areas are new development areas, they are characterized as Developing Communities in the MTP/SCS. These Developing Communities include the specific plans for Placer Vineyards, Regional University, Riolo Vineyards, and Bickford Ranch. The county's long term vision for growth includes an additional new growth area, located just north of Baseline Road and the Placer Vineyards plan area. This area has been identified in for future growth in the general plan and the County Board of Supervisors has recently updated the county's work plan to include development of a specific plan for this area. This area and the remaining portions of the unincorporated county are not identified for development in the current MTP/SCS planning period.

Placer Vineyards is the largest Developing Community in Placer County, located on the Sacramento-Placer county line. At build out this plan will accommodate land for about 7,691-8,267 employees and 14,132-21,631 housing units. Employment uses include commercial, office, industrial and public uses. Residential uses range from low density to high density, including mixed-use, with an average density of 7-11 units per acre. Regional University, located adjacent to the Roseville city limits is planned for 4,389 new housing units and about 1,900 new jobs at build out. This plan includes land for a new university campus, which is where the majority of the jobs are expected to come from, along with some neighborhood serving retail and commercial uses. Because the plan includes a major university campus and it is adjacent to a more urban part of the county, Roseville, the residential densities planned for this area will average 13 units per acre, not including the on-campus housing. These two plans represent a shift in the traditional type of development Placer County has done historically. Riolo Vineyards is located between Placer Vineyards and the established, but rural community located around PFE Road and Walerga Road. This plan, at build out will include 938 housing units, at an average density of four units per acre and about 170 jobs, mostly neighborhood service commercial and public uses. The Developing Community, Bickford Ranch, is located in a primarily rural residential area, east of Lincoln. This plan has capacity for 1,900 homes, averaging three units per acre, and about 200 employees that are mostly neighborhood supporting commercial and public uses.

Because of the amount of development planned in the southwest portion of the county, Placer County, in partnership with South Placer Regional Transportation Authority, Placer County Water Agency, the City of Lincoln, CA Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and the California Regional Water Quality Control Board is developing the Placer County Conservation Plan (PCCP). The Conservation Plan is being prepared in three phases. Phase 1 is currently underway and covers 273,983 acres of the valley floor and low foothill portions of Placer County. The Agency Draft Placer County Conservation Plan was released on February 1, 2011.

Capacity in Established Communities and Developing Communities is estimated at 37,131 new homes and 93,331 new jobs. Established Communities, if built out, would add 82,900 new jobs, most of which in the Sunset Industrial Community Plan area. Established Communities, also if built out, would add 8,437 new housing units. The remaining capacity comes from Developing Communities, cited above.

While there is a large amount of residential capacity in Rural Residential Communities, that capacity is not considered in the capacity number cited above. Rural Residential Communities in Placer County are expected to experience low amounts of growth, approximately 2,090 new housing units and 342 new jobs by 2035. The MTP/SCS forecast assumes relatively small amounts of new rural residential homes to be constructed in the region by 2035. This is in part due to the current recession combined with changing demographics which suggest a higher percent of the population will want to live on smaller lots or in attached homes near existing jobs, services, and with more transportation choices. In Placer County, this is also in part due to potential wildfire risks in these areas.

In total, the MTP/SCS forecast for unincorporated Placer County includes 17,799 new housing units and 17,971 new jobs by 2035. Of this, the majority of new jobs, 14,143, are in Established Communities, primarily located in the Sunset Industrial Community Plan area and the area around Auburn. Established Communities also account for 2,686 of the new housing units. The majority of the new homes are in the southwest Placer Developing Communities. Placer Vineyards, the largest of the plans is projected to construct 7,886 new housing units and 3,007 new employees in the MTP/SCS. Regional University includes 2,781 new housing units and 349 new jobs. The development of the university is not included in the MTP/SCS because it is most likely to begin construction after the current planning period. The MTP/SCS forecast includes 928 new housing units and 130 new employees in Riolo Vineyards and 1,428 new homes are in Bickford Ranch. The MTP/SCS forecast assumes 30 percent of the 2035 housing and job growth will likely occur by 2020. This early job growth outpaces the regional average and is likely to occur because the southwest Placer area is a strong and growing regional job center today. The housing growth is slower in the early years than the regional average of 39 percent primarily because so much of the new housing growth is in Developing Communities that have not yet begun building. While it is anticipated that all four Developing Communities will begin construction prior to 2020, it will likely begin very close to 2020 and therefore most of the growth in these communities is expected to happen in the latter half of the planning period.

The timing of PCCP adoption will be the dominant issue tracked through regional monitoring that might influence Placer County growth patterns in future MTP/SCS updates. The ultimate resolution of the PCCP may also influence the expected pace of rural residential development.

## SACRAMENTO COUNTY

### *Citrus Heights*

Citrus Heights has limited growth opportunities in the near term as the city is nearly built out, with 78 percent of its employment growth capacity and 91 percent of its housing growth capacity built today. For this reason, much of the city is characterized as Established Community in the MTP/SCS. The city has one large remaining infill opportunity in the Established Community area and that is the golf course located near Greenback Lane and Sunrise Avenue. The city and the redevelopment agency have identified two corridors in the city for targeted redevelopment and revitalization. These areas, the Auburn Boulevard corridor and the Greenback Lane corridor, make up the Center and Corridor Communities in the MTP/SCS within the city. The city will use the approved Auburn Boulevard Specific Plan and the completed Sunrise Market Visioning Project to facilitate redevelopment and infill in these Center and Corridor Communities.

The MTP/SCS forecast for Citrus Heights is 3,758 new housing units and 4,539 new employees by 2035. Of this, 59 percent of the new jobs and 34 percent of the new housing units are expected to occur in Center and Corridor Communities while the remaining growth is in Established Communities, including the development of the golf course property noted above. Most of this development is expected to occur in the latter half of the planning period because market forces are still weak in the near term to support significant infill growth in either of these community types in Citrus Heights. Only 19 percent of the city's 2035 employment growth and 20 percent of the city's housing growth is expected to occur by 2020. In both cases, this is significantly lower than the regional average of 28 percent of 2035 job growth and 39 percent of 2035 housing growth by 2020.

Because employment in the city is projected to grow slightly faster than residential, the city's jobs-housing balance will improve slightly from 0.5 today to 0.6 in 2035.

Regional monitoring will focus on the future of redevelopment authorities for local governments, which could in turn influence the pace of growth in Citrus Heights.

### *Elk Grove*

Over the last decade Elk Grove has experienced significant residential growth. While much of this development is newer, particularly west of Highway 99, it has happened so rapidly that the city is almost 75 percent built out in terms of residential uses and 56 percent build out in employment uses. For this reason, much of the city is considered an Established Community in the MTP/SCS. Not included in the Established Community area are the rural residential areas, historic Elk Grove, and the newest and not yet built planning areas. The northeast corner of Elk Grove has historically been rural residential uses. This area is intended for continued rural residential uses in the city's general plan and as a result, this area is a Rural Residential Community in the MTP/SCS. Old Town Elk Grove is a Center and Corridor Community in the MTP/SCS, consistent with the city's revitalization effort in its Old Town Elk Grove Special Planning Area. The newest specific plan in the city to be adopted and start building in recent years is Laguna Ridge. Less than ten percent built out today, Laguna Ridge is a Developing Community in the MTP/SCS. A second Developing Community is known as the Triangle Special Planning Area. Similar to Laguna Ridge this plan area has also started building in recent years and is just less than half built out today. Three other new growth areas in the city, all in the southern portion of the city adjacent to Laguna Ridge, represent the next increment of new growth for the city. This area is covered by three Developing Communities, the adopted Lent Ranch Marketplace Special Planning Area and two policy areas, Sterling Meadows and Southeast Planning Area. Elk Grove recently completed a Market Study for the city to identify economic development opportunities and land use needs for the city. The study supports the city's strong desire to add more jobs to the city to help balance the currently housing concentrated character. The city also currently has a sphere of influence amendment application in with Sacramento LAFCO to create a sphere of influence directly south of the existing city limits. The city has indicated that its intention for the proposed SOI is to help in bringing more employment opportunities to the city in the long term. This area is not identified for development within the current MTP/SCS planning period.

By 2035, the MTP/SCS forecast for Elk Grove adds 16,992 new housing units and 19,189 new employees to the city. Approximately 26 percent of these housing units and 47 percent of the employees are building out the city's Established Communities and Rural Residential Communities. The majority of the new growth, approximately 74 percent of the housing growth and 53 percent of the employment growth, will occur in the city's Developing Communities. The Laguna Ridge Specific Plan is approved to build 7,767 housing units; however, the city has estimated a reduced build out estimate of 6,400 units will likely be built. The MTP/SCS forecast is for a total of 7,590 housing units built by 2035 in this area, with an average density of eight units per acre. This area is also planned for employment uses including retail, office, and future civic center that, together, will generate 4,281 employees in total by 2035. Because the plan is adopted, has no infrastructure or natural resource issues, and market trends are pointing towards smaller lot sizes and not larger, it is likely that the approved build out, or something very close to it, is most likely to be built by 2035. The Lent Ranch Special Planning Area is primarily a plan for new employment uses that could accommodate 4,400 employees and 280 new multi-family units at build out. The MTP/SCS forecast for this Developing Community is for 3,207 new employees and 280 new housing units at an average density of 24 units per acre. The Southeast Planning Area is proposed to include 4,600 homes and land for 5,100 jobs. Though this area does not have an adopted plan, the MTP/SCS forecasts 4,077 new homes and 3,493 new jobs in this area by 2035 because of its proximity to other Developing Communities and because the city's overall growth forecast cannot be met without development of this area. Sterling Meadows, a Developing Community situated in between Southeast Planning Area and Lent Ranch, is a residential only community planned for 1,204 new units at a density of eight units per acres. The MTP/SCS forecast assumes approximately 79 percent of these units will develop by 2035. The remaining 113 new housing units in the MTP/SCS forecast for Elk Grove come from the Triangle area. This Developing Community at build out would add an additional 200 units to the 113 units forecast in the MTP/SCS.

While virtually all development in Elk Grove had been residential in the past several years, the city is projected to capture a greater share of the region's employment over the MTP/SCS planning period. About five percent of the regional employment growth is forecasted in Elk Grove. This is supported by the city's effort to attract more jobs and that by the fact that it has begun to see some of this employment growth in the recent arrivals and expansions of a number of medical facilities. The MTP/SCS forecast provides a jobs-housing ratio of 1.1 for the growth in the city; this will help improve the city's jobs-housing balance from .06 today to 0.7 in 2035. It will, however, take time for the city to establish this jobs growth. Because of the current recession and particularly high vacancy rates in commercial and office buildings today, much of the employment growth is expected to occur in the latter half of the planning period while the residential growth is expected to grow faster in the early years of the plan. Approximately 28 percent of the city's 2035 employment growth is forecast to occur by 2020, while approximately 49 percent of the city's 2035 housing growth is forecasted by 2020. Much of this housing is the continued build out of Laguna Ridge which is under construction today.

Key issues that may influence the trajectory of growth in Elk Grove that will be tracked through the regional monitoring program include the timing of implementation of the South Sacramento HCP, which includes Elk Grove, the nature of the city's SOI, once its approved by LAFCO, and the pace of success of the city's substantial initiatives to promote jobs growth, and whether the city starts to experience any of the types of redevelopment activity in existing areas that are part of the typical evolution of urban areas. Any or all of these could lead to a changed land use forecast for the city in future MTP/SCS update cycles.

### *Folsom*

Folsom's rapid growth in the last several years was a balance of employment and housing growth. The city is home to several major employers and, along with the rest of the region, has experienced robust residential growth in the past decade. Today, about 87 percent of the city's housing capacity and 64 percent of the employment capacity is built out. Therefore, much of the existing city is characterized as Established Community in the MTP/SCS. The city's historic downtown and three light rail station areas (within a half mile of each) are Center and Corridor Communities in the MTP/SCS. Earlier this year the city completed its Historic Sutter Street Revitalization Project, which included streetscape and building façade improvements and also a new public plaza which is currently under construction. This area also includes future plans for mixed-use commercial and residential projects. The city recently adopted a specific plan for the area just south of the city limits, in the current SOI area, and is actively pursuing annexation of the area. This specific plan area is a Developing Community in the MTP/SCS. This specific plan is for a mix of housing and employment that, at build out, would include 10,210 new housing units and 13,210 new employees. Employment uses include commercial, office, light industrial and public. The average residential density for this plan is 9 units per acre.

Capacity in the city, including the current SOI area, is estimated at 14,139 new housing units and 32,381 new jobs. Established Communities, if built out, would add 15,595 new jobs and 3,155 new housing units. Build out capacity in Center and Corridor Communities would add 775 new housing units and 3,575 new employees. The remaining capacity comes from the Developing Community, cited above.

In total, the MTP/SCS forecast for Folsom includes 10,247 new housing units and 13,304 new jobs by 2035. Of this, the majority of the new jobs, 10,264, are in Established Communities. The majority of the new jobs are commercial, office, and light industrial filling in the existing employment centers along Highway 50. Established Communities also add 2,795 new housing units. These are primarily filling in the newer subdivisions in the eastern portion of the city. New development in Center and Corridor Communities includes 1,749 new jobs and 765 new housing units. Almost all of the new housing capacity in these areas is included in the MTP/SCS because much of it is under construction or proposed today. The majority of the new jobs come from larger commercial, office, and industrial infill opportunities around some of the light rail stations. A smaller number of employees in these areas are from new public uses and mixed-use developments. The Folsom SOI includes 65 percent of the city's new housing growth and 10 percent of the new employment growth. Because Folsom is a growing community and is nearly built out today in residential capacity, this Developing Community is where much of the future housing growth is projected to occur. Conversely, the city has a high percentage of existing undeveloped employment land in the city limits and that, combined with currently high vacancy rates, make employment uses in the SOI less likely to begin construction as early as the housing development will begin. The city as a whole includes a regional job center, good transit access, and as a result the city is expected to grow faster than the regional average. The MTP/SCS forecast assumes 52 percent of the 2035 housing growth will occur by 2020 and approximately 35 percent of the 2035 jobs will occur by 2020.

Issues that will be tracked through the regional monitoring program include whether the relatively high commercial growth planned in the SOI plan is realized and whether there is any fine-tuning to the housing plans in the SOI.

### *Galt*

The City of Galt is centered on Highway 99 at the southern edge of Sacramento County. In the past decade, the city has experienced moderate housing and employment growth. Today about 80 percent of the city's residential capacity is built out. For this reason, most of the area in the existing city limits is characterized as Established Community in the MTP/SCS. These Established Communities have the capacity to add 1,845 new housing units, primarily through building out existing subdivisions and some infill, and 6,351 new jobs. The majority of the potential new jobs are industrial uses in the existing industrial complexes located north of Elm Avenue and new commercial uses along Highway 99. The city's historic downtown and the adjacent Lincoln Way and C Street corridors are Center and Corridor Communities in the MTP/SCS, as is part of the Twin Cities Road area. This area has capacity to add about 178 new housing units and 1,322 new jobs. Included in this capacity is the recently constructed Galt Place, an 80 unit mixed use senior living facility. The city recently adopted a new general plan. This plan includes new employment and residential growth outside of the city limits, with planned employment uses concentrating north of the city along Highway 99 and residential and neighborhood supporting employment uses to the east. The city recently received LAFCO approval for this new SOI boundary, which actually shrinks the footprint of the city's previous SOI area by removing much of the western area from the city's SOI. This area is a Developing Community in the MTP/SCS. Though there is no specific plan for the area, the general plan designated land uses include residential growth that would average five units per acre that could result in a total of 7,577 housing units and 24,040 employees at build out. Much of the new employment concentrated along Highway 99 is a targeted effort by the city to provide economic development opportunities in the city that will help improve the city's currently low jobs/housing ratio.

In total, the MTP/SCS forecast for Galt includes 2,905 new housing units and 3,041 new jobs by 2035. Of this, 1,841 new housing units and 2,078 new employees are in Established Communities; 178 new housing units and 827 new employees are in Center and Corridor Communities; and 886 new housing units and 136 new employees are in Galt SOI Developing Community. The MTP/SCS forecast assumes 28 percent of the 2035 housing and employment growth will occur by 2020.

Like many other jurisdictions throughout the region and in Sacramento County especially, future growth patterns in Galt could be influenced by the timing of implementation of the South Sacramento HCP, which includes Galt, and the ultimate resolution of redevelopment powers for local governments at the state level. Future transit connections both north to Elk Grove and Sacramento and south to Lodi and Stockton could also influence growth patterns in Galt.

### *Isleton*

The city of Isleton is located in the southern most portion of Sacramento County in the Sacramento River Delta. Almost 70 percent built out, the city is an Established Community in the MTP/SCS.

Capacity in Isleton is estimated at 158 new housing units and 56 new jobs. In total, the MTP/SCS forecast for the city includes 91 new housing units and 44 new jobs by 2035. The MTP/SCS forecast assumes about 29 percent of the 2035 housing and employment growth will occur by 2020.

Isleton growth patterns are strongly influenced by its location in the Delta, and the progress of implementing new state legislation affecting all aspects of the future of the Delta will be tracked for its potential influence on Isleton and other portions of the region.

### *Rancho Cordova*

Rancho Cordova emerged as a regional job center over the past twenty years, with a high ratio of jobs-to-housing units. During that time, housing development did not keep up with employment growth. The new city recently completed its first general plan, which places heavy emphasis on improving jobs-housing balance within the city. In support of this goal, several specific plans are adopted or under development with the aim of providing housing for the existing and projected workers in Rancho Cordova. These new adopted and proposed specific plans are characterized as Developing Communities in the MTP/SCS and include the following plan areas: Sunridge, Ranch at Sunridge, Suncreek, Arboretum, Rio Del Oro, and Westborough. The city has four light rail stops within the city limits. These station areas, along with the entire Folsom Blvd corridor, are part of the city's adopted Folsom Boulevard Specific Plan. This specific plan supports high density and mixed use development and redevelopment along the corridor. This area is a Center and Corridor Community in the MTP/SCS. The remaining city is characterized as an Established Community in the MTP/SCS.

Within these community types, the city has the capacity to add 79,687 new jobs and 49,065 new housing units by 2035. Established Communities have the capacity to add 28,872 new jobs and 1,743 new housing units. These new commercial, office, and industrial jobs are primarily located in the central portion of the city in the office park and industrial complexes that exist today. The housing capacity comes from building out newer subdivisions and more traditional infill. The Folsom Boulevard Specific Plan, due to its higher densities and office and commercial mixed use land designations, has the potential to add 23,740 new jobs and 9,668 new housing units. The remaining 34 percent of the new employment capacity and 77 percent of the new housing capacity is in the Developing Communities. Sunridge is the only Developing Community in the city that has an adopted specific plan and has started building. At build out this area will include 8,763 housing units and 3,547 jobs, although the final resolution of on-going litigation and subsequent decisions by the Army Corps of Engineers potentially affecting up to four of the sub-areas in that plan bordering Grant Line Road could ultimately change these estimates. This area includes new commercial and public uses and a range of new housing types, averaging eight units per acre. In the middle of the Sunridge Specific Plan area is another Developing Community, the Ranch at Sunridge. Though this plan is not yet adopted, it proposes to add 2,713 new homes and about 360 new jobs. This plan includes mostly residential uses, averaging 12 units per acre, with some supporting commercial and public uses. Directly south of Sunridge and the Ranch at Sunridge is Suncreek. This proposed specific plan has capacity to add up to 5,616 new homes and 1,404 new jobs. Similar to its surroundings, this plan is mostly residential, with an average density of 9 units per acre, and includes some neighborhood serving commercial employment uses as well. South of Suncreek, reaching the southernmost portion of the city is the proposed Arboretum development. This proposed plan, with an average density of 11 units per acre and supporting commercial uses, could add 4,992 new housing units and 3,861 new jobs. Heading back north, just above Douglas Road, is the proposed Rio Del Oro Specific Plan. This is the largest Developing Community in the city. Located adjacent to the eastern edge of the city's existing industrial complex areas, this plan is proposed to expand those employment uses and add significant housing. In total, this proposed plan would add 12,558 new jobs and 11,761 new housing units. The western portion of the plan includes all types of employment uses, primarily office and light industrial. New housing growth also includes a wide range of housing types, which have an average density of ten units per acre. Directly north is Westborough. This Developing Community is the least far along in the planning process. An initial proposed plan that could add 6,076 new housing units and 5,382 new jobs. Similar to Rio Del Oro, this plan would include a variety of employment uses, including office parks and industrial uses. Expected for higher density development, this plan would average 15 units per acre.

The MTP/SCS forecast includes 26,376 new jobs and 25,354 new housing units by 2035. While Rancho Cordova is expected to maintain its share of the region's employment, it will increase its share of the region's housing by 2035, bringing its high jobs-to-housing ratio toward balance- from 2.2 today to 1.6 in 2035. The majority of new housing growth, 74 percent, is in Developing Communities (about half of their total capacity). Because these Developing Communities are clustered together, in an urban area with a regional employment center, and are all planned for densities consistent with the small lot and attached products that are projected to be in high demand, the MTP/SCS assumes that all of these Developing Communities begin to build by 2035. These areas account for significantly less of the city's MTP/SCS employment forecast. About 27 percent of the new jobs in the city will be in Developing Communities. Because many of them are housing focused, it is likely that the housing units will begin building before the employment uses. Additionally, the city has existing employment centers that will capture much of the estimated employment growth. Established Communities make up 60 percent, or 15,744 of the new employment growth and 7 percent or 1,712 of the new housing units. As noted, most of this employment growth is projected to be in the existing employment centers near the center of the city, south of Highway 50, while the majority of the new housing growth will occur through infill and building out existing subdivision. The Center and Corridor Community makes up the remaining 3,446 new jobs and 4,824 new housing units in the city in the MTP/SCS. Infill and redevelopment along the Folsom Boulevard corridor is largely expected during the latter portion of the planning period. In this Center and Corridor Community, only 11 percent of the housing growth and 23 percent of the employment growth expected by 2035 is assumed to occur by 2020. Similarly, the Developing Communities also have the majority of their growth happening in the latter half of the planning period. Because many of these plans are not yet approved, but are currently in process, it is likely that not all of them will begin to build by 2020 and many of them will have just begun construction somewhere close to 2020. Because of the slower growth anticipated in the early years of the plan in these two community types, the city as a whole is expected to grow slower than the regional average during the first 12 years of the plan.

Issues to track through the regional monitoring program include how the final resolution of the South Sacramento HCP, the resolution of outstanding legal issues in some of the developing areas, and the state's attempt to restrict local government redevelopment patterns ultimately affect growth patterns in the city.

### *Sacramento*

The City of Sacramento is centrally located in Sacramento County and is the largest city in the SACOG region, currently having 30 percent of the region's jobs and 22 percent of the housing units. The city recently updated its general plan. The new plan aims to accommodate substantial population growth, largely through infill, reuse, and redevelopment strategies. The general plan identifies opportunity areas throughout the city for significant changes in land use and increased densities. New housing and jobs will be distributed among activity centers of various sizes (neighborhood, sub-regional, and regional), transportation corridors, and new growth areas. These areas generally correspond with the MTP/SCS community types. In the past decade, the majority of the city's employment and residential growth occurred in the North Natomas community and as a result, residential uses in this area are largely built today. For this reason, North Natomas is included with the communities of South Natomas, North Sacramento, Land Park, Pocket, South Sacramento, and Fruitridge/Broadway as having most of their land area in Established Communities in the MTP/SCS. The city has two new growth areas within the current city limits. These areas, marked by the approved Greenbriar Specific Plan and the Delta Shores Specific Plan, are Developing Communities in the MTP/SCS. However, because of the planned light rail extension, much of the Greenbriar Specific Plan is considered a Center and Corridor Community in the MTP/SCS. The city's general plan also identifies two other new growth areas outside the current city limits. One is located adjacent to the southwest corner of North Natomas and the other is located adjacent to the northeast corner of North Natomas. These two areas are not identified for growth in the current MTP/SCS planning period primarily due to their unincorporated status and potential flood and habitat issues. In addition, Sacramento City and County have a joint MOU that covers the North Natomas Vision Area, which runs north of the current North Natomas Community Plan to the County border with Sutter County. There are substantial development plans by the property owners in this area, but progress on them requires future actions by either the county and/or city, successful completion of levee upgrades, and resolution of substantial permit issues with federal resource agencies. Future growth patterns in the vision area may also be influenced by the timing of constructing the light rail line to the airport and the rate at which the large employment land area east of the expanded Sacramento International Airport expands. This area is not identified for development in the current MTP/SCS planning period.

While most jurisdictions in the region are described as having Established Communities and Developing Communities as their primary community types and growth areas, the City of Sacramento is unique in that Center and Corridor Communities cover much of the city and are the locations where most of their new growth is concentrated. Consistent with the city's infill focused general plan, over the past several years, the downtown area and surrounding neighborhoods have also seen significant revitalization in the form of infill and redevelopment, much of it in mixed-use format. South and east of downtown, infill development has also occurred, albeit on a smaller scale. The entire central city area along with areas covered by a half mile buffer around existing and proposed light rail stations generally make up the Center and Corridor Communities in Sacramento. For discussion purposes these Center and Corridor Communities are grouped into the following six subareas: (1) the central city, covering the area from Broadway to the American River and from the Sacramento River to Alhambra Boulevard., (2) the existing south-line light rail stations, (3) the proposed south-line light rail extension stations, (4) the folsom-line light rail stations, (5), the northeast line light rail stations, and (6) the proposed north airport-line light rail stations.

The central city Center and Corridor Community is the urban center of the region, encompassing downtown Sacramento, including the State Capitol. This area includes many of the city identified opportunity areas, including the central business district, R street, Broadway, and the 12th, 16th, 19th, and 21st Street corridors. As noted above, these areas have seen an influx of high density residential and mixed-use projects in recent years. This area also includes the city's largest redevelopment opportunity, the Railyards project, where a specific plan has been approved and site cleanup has begun. Located directly north of the Railyards is the Richards Boulevard area which is also planned for significant growth and re-vitalization that has begun with the completion of the new Greyhound Bus terminal and construction of Township 9, a new mixed-use development. The Docks Area Project is a new river-front mixed use plan located along the Sacramento River in the southwest corner of the Center and Corridor Community. Unlike anywhere else in the region, this area has capacity for and plans to build new office, residential and mixed-use building that are likely to exceed three and four stories. In the downtown area, it is possible that new mixed-use and high density housing project could range from four to 24 stories. Most new office building are also likely to build in that same range, however, there is no height limit on new office buildings in the downtown area. Collectively this Center and Corridor Community has the potential capacity to add more than 54,000 new jobs and 27,000 new homes. This would more than double the amount of existing housing units in the central city.

The existing south-line light rail stations span from Broadway to Meadowview and include portions of Florin Road just outside the half mile station area. The proposed south-line extension will begin at Meadowview and expand down to Consumnes River College. The Folsom-line includes station areas from 4th Street to College Greens within the city limits. The northeast-line includes stations from the American River to Watt Avenue in the city limits. The proposed airport-line will include a number of stations beginning near West El Camino Avenue and extending to Greenbriar in the city limits. Similar to the central city Center and Corridor Community, these communities overlap with a number of the city's opportunity areas. The city also has a number of approved plans for various areas within these Center and Corridor Communities. These include: Curtis Park Railyards, Florin Road Corridor Plan, 65th Street Transit Village, Northeast Line Area Plan, and Swanston Transit Village. The city's general plan and infill programs further support development in these areas. Together, these Center and Corridor Communities have the potential to add about 31,000 new employees and 29,000 new jobs.

In total, the MTP/SCS forecast includes 69,208 new housing units and 77,098 new employees by 2035 in the City of Sacramento. Approximately 52 percent of that employment growth and 62 percent of the housing growth is in Center and Corridor Communities, much of it in the central city area. Adding significant new housing to the central city area will provide a better jobs-housing ratio and will help in reducing regional VMT. About 46 percent of the city's MTP/SCS employment growth and 30 percent of the housing growth is in Established Communities. Much of this housing growth is the continued build out of North Natomas; however it does include some infill in other existing communities as well. Most of the employment growth is either neighborhood serving commercial and public uses, hospital and college expansions, as well as new industrial uses that are mostly concentrated in the existing industrial center in the southeast portion of the city. Delta Shores, Developing Community, is expected to almost build out the 5,106 new units planned for that area. The average density for this new residential growth is 16 units per acre. The plan has significant commercial lands planned that could provide 6,678 new employees. The MTP/SCS assumes the start of this construction, resulting in 2,123 new employees.

Sacramento is anticipated to maintain a large share of the population, housing, and employment in the SACOG region through 2035. The MTP/SCS forecast assumes the city experiences new housing and employment growth at a pace a little faster than the regional average of 28 percent of new 2035 jobs occurring by 2020 and 39 percent of new 2035 homes by 2020. This is primarily due to the time needed to pull out of the current recession and see some significant new job growth in our region. Most of new growth during the first half of the MTP planning period will occur through development in the city's Established Communities (particularly build-out of North Natomas), as well as a substantial amount of new housing and employment will also occur through infill in Center and Corridor Communities.

There are many issues to track through the regional monitoring program that may influence City of Sacramento growth rates. The future of redevelopment in the state, the success of the city's initiative to comprehensively update its zoning to help it implement its new general plan, the ability of the region and the commitment of the city to build major infrastructure projects (three new bridges, a streetcar system, extend light rail to the airport), and ultimately the amount of market demand for the urban housing projects envisioned by the general plan will also significantly influence future growth patterns in the city.

### *Sacramento (Unincorporated County)*

Unincorporated Sacramento County is the most urbanized of the unincorporated counties in the Sacramento region, with 25 and 20 percent of the region's existing housing and employment, respectively. The majority of its population resides within the Urban Policy Area (UPA), which lies within the Urban Services Boundary (USB), the ultimate boundary for urbanization in the unincorporated county. Sacramento County is nearing completion of an update to its general plan that would facilitate infill and revitalization in targeted commercial corridors within the existing UPA and employ a smart growth management framework in considering proposed UPA expansions.

Today, most of the communities within the UPA are identified in the MTP/SCS as Established Communities. Most of these are residential in character (e.g., Arden Arcade, Carmichael, Cordova, Fair Oaks, North Highlands, Orangevale, Rancho Murieta, and South Sacramento) and are projected to receive relatively small amounts of future growth, all consistent with existing plans in order to retain the character of the neighborhoods. Some are important and growing employment centers (e.g., Sacramento International Airport, Aerojet, McClellan, and Mather). These Established Communities contain 80 percent of the existing housing and 50 percent of jobs in the unincorporated county.

Running between and through these communities are miles of major roadways flanked primarily by commercial land uses. The county's general plan update identifies 13 commercial corridors for varying levels of additional commercial and residential development through reinvestment and redevelopment. Given the county's planning efforts underway to allow for additional growth in these corridors, they are identified in the MTP/SCS as Center and Corridor Communities. The corridors include Auburn Boulevard, Fair Oaks Boulevard in Arden Arcade, Fair Oaks Boulevard in Carmichael, Fair Oaks Boulevard in Fair Oaks, Greenback Lane in Orangevale, Watt Avenue and Fulton Avenue in Arden Arcade, North Watt Avenue and West of Watt in North Highlands, Florin Road and Stockton Boulevard in South Sacramento, and the unincorporated portions of Folsom Boulevard, where the four light rails stations offer significant opportunity for transit oriented and mixed-use development. The county has either completed or initiated planning processes for all of these corridors, with the goal of promoting economic revitalization within them, for the surrounding communities and for the county as a whole.

Outside of Established Communities and Center and Corridor Communities, new growth areas in unincorporated Sacramento County, identified as Developing Communities in the MTP/SCS, are mostly south of Highway 50 and west of Interstate 80. These include the Elverta Specific Plan in northern Sacramento County, the Florin Vineyards, North Vineyard Station, and South Mather Specific Plans in central Sacramento County, and the Glenborough/Easton Specific Plan in eastern Sacramento County. In addition to these Developing Communities, the western portion of the Jackson Road/State Route 16 corridor, surrounded by urban development on the north and west, and adjacent to the Vineyard community on the south, is identified as a Developing Community in the MTP/SCS. Under the county's draft general plan, the UPA may be expanded if proposed development projects are consistent with a new growth management framework, which is built upon the relationship between land use and transportation to achieve goals and requirements relative to air quality, transportation, land use, infrastructure, and GHG emissions. Outside the current UPA, the county's long-term vision includes additional new development in the Jackson Road/State Route 16 area, inclusive of the area south of Elder Creek Road, west of Excelsior Road and the area east of Excelsior Road, north of Florin Road, as well as new development east of Grantline Road, adjacent to the Rancho Cordova city limits. These areas are not identified for development in the MTP/SCS.

Outside of the USB, land uses are primarily agricultural or agricultural-residential. The latter of these land uses is clustered in the communities of Orangevale in the north county, and Alta Mesa, Clay, Franklin, Herald, Sloughhouse, and Wilton in the south county. These communities are identified in the MTP/SCS as Rural Residential Communities. The county's draft general plan contains policies to preserve these historic communities without encouraging excessive growth due to the high cost of providing services to these remote locations. However, the exception to this is in the northern portion of the county. Sacramento City and County have a joint MOU that covers the North Natomas Vision Area, which runs north of the current North Natomas Community Plan to the County border with Sutter County. There are substantial development plans by the property owners in this area, but progress on them requires future actions by either the county and/or city, successful completion of levee upgrades, and resolution of substantial permit issues with federal resource agencies. Future growth patterns in the vision area may also be influenced by the timing of constructing the light rail line to the airport and the rate at which the large employment land area east of the expanded Sacramento International Airport expands. This area and the remaining areas of the unincorporated county are not identified for development within the current MTP/SCS planning period.

In addition to the general plan update, the county is in the midst of preparing the South Sacramento Habitat Conservation Plan (SSHCP). The SSHCP will consolidate environmental efforts to protect and enhance wetlands (primarily vernal pools) and upland habitats to provide ecologically viable conservation areas. It will also minimize regulatory hurdles and streamline the permitting process for development projects. Sacramento County is partnering with the incorporated cities of Rancho Cordova, Galt, and Elk Grove as well as the Sacramento Regional County Sanitation District, Sacramento County Connector JPA, and Sacramento County Water Agency to further advance the regional planning goals of the SSHCP. The Study Area excludes the City of Sacramento, the City of Folsom and Folsom's Sphere of Influence, the Sacramento-San Joaquin Delta, and the Sacramento County community of Rancho Murieta. At this juncture it is not certain when this process is likely to conclude, though the county and other parties have placed a high priority on successfully completing it as soon as possible.

By 2035, the MTP/SCS forecasts that unincorporated Sacramento County will continue to be the most urbanized county in the region. The MTP/SCS forecasts 51,181 new housing units and 67,872 new employees by 2035 in areas of unincorporated Sacramento County that have potential build out capacity of 95,282 new housing units and 184,389 new employees. Within the existing urban core, new growth will occur through limited infill and redevelopment in Center and Corridor Communities. By 2035, the MTP/SCS forecasts 23,687 new housing units and 30,241 new employees within Center and Corridor Communities out of a potential build out capacity of 39,101 new housing units and 53,216 new employees. This new growth will take the form of medium- to high-density residential, commercial, office, and public uses. New housing will be predominantly medium-high and high density. Of this new development, only 24 percent of the housing growth, and 16 percent of the employment growth, is expected to occur by 2020; the majority of this new development is expected to occur after 2020.

The vast majority, 84 percent, of the housing growth in Centers and Corridors is projected for three general areas: light rail stops, west of the northern Watt Avenue area surrounding the McClellan employment center, and in transportation corridors (Stockton, Franklin, Florin) in southern Sacramento County. The remaining 16 percent of the forecasted housing (3852 units) is in relatively small amounts along seven other corridor segments throughout the county. In the county's Established Communities, the MTP/SCS forecasts 8,915 new housing units and 28,672 new employees by 2035, out of a total build out capacity of 13,973 new housing units and 100,183, new employees. Residential growth in Established Communities is expected to occur through small-scale infill of existing low density residential lots, in line with the county's existing zoning and general plan; employment growth in Established Communities is expected to occur through a combination of new construction and intensification of commercial, industrial, and public uses in existing employment areas, including the recent expansion of Sacramento International Airport and the adjacent proposed industrial park.

In the Developing Communities of the unincorporated county, the MTP/SCS forecasts 17,947 new housing units and 7,524 new employees by 2035 out of a total build out capacity of 41,543 housing units and 27,552 employees. The Elverta Specific Plan, is the only recently adopted specific plan in the north unincorporated county, immediately south of the Placer County line. This specific plan is forecast to build 1,432 housing units and 336 employees out of a total planned capacity of 4,904 housing units and 371 employees. This community is planned for an average residential density of 5 units per acre with neighborhood supporting commercial and public uses. The other Developing Communities identified in the MTP/SCS are south of Highway 50. Of these, three are located south of State Route 16 in the Vineyard Community, for which several specific plans were initiated and adopted within the last 15 years. The Vineyard Springs Comprehensive Plan is the oldest of these. The MTP/SCS forecasts 2,142 new dwelling units and 1,413 new employees by 2035, out of a total planned capacity of 4,657 housing units and 2,455 employees. The average residential density is 4 units per acre and the plan includes neighborhood serving commercial and public uses. North Vineyard Station, adopted in 1998, is projected to receive 3,144 new housing units and 350 new employees by 2035, out of a planned capacity of 6,010 new housing units and 747 new employees. Growth in this Developing Community is predominantly residential, at an average density of 7 units per acre, supported by neighborhood commercial and public uses. Florin Vineyard Community Plan, adopted in 2010, fills in the 'gap' between a number of specific plans in the Vineyard area. This area, planned for a capacity of 9,393 housing units and 5,281 employees, is expected to grow by 2,029 housing units and 566 employees during the MTP/SCS planning period. Uses in the Florin Vineyard Community Plan range from residential development at an average density of 6 units per acre to neighborhood serving commercial and public uses, to office and industrial uses. Just north of the Vineyard Developing Communities, the western Jackson Road/State Route 16 corridor, is identified in the MTP/SCS for conversion from its current aggregate mining operations to a mixed-use residential community. Although no plan has yet been entitled for this area, its adjacency to urban infrastructure on the west and north, the absence of sensitive natural resources and other natural constraints, and efforts by the landowner to begin converting the site, indicate that the area will see some amount of urban development by 2035. The MTP/SCS forecasts 4,899 new housing units and 2,224 new employees in the Jackson Developing Community, out of a potential total capacity of 10,803 new housing units and 12,150 employees. General uses in this Developing Community include residential uses at an average density of 11 units per acre, various commercial and office uses, and community-supporting public uses. East along the Jackson Corridor, the South Mather Specific Plan, located north of Jackson Highway and west of Sunrise Boulevard, is a proposed amendment to an adopted reuse plan for the former Mather Air Force Base. The county-initiated South Mather plan contemplates a mixed-use community that would accommodate a total capacity of 2,504 new housing units and 4,991 new employees. Of this, the MTP/SCS forecasts construction of 1,039 new housing units and 230 new employees by 2035. The plan is focused on attracting a university or large employer and thus includes office and light industrial uses in addition to commercial and supporting public uses. Residential densities average 16 units per acre. North and east of South Mather, the MTP/SCS also forecasts growth within the Glenborough Specific Plan. This Developing Community is a reuse of the eastern portion of the Aerojet campus along Highway 50, east of the city of Rancho Cordova and southwest of the city of Folsom. The portion of the project known as Easton covers the Hazel light rail station and lands within a half mile of that and are therefore identified in the MTP/SCS as part of the county's Center and Corridor Communities. Glenborough specific plan was adopted by the county as a mixed use residential community planned for a total of 3,272 new housing units and 1,557 new employees (excluding the Easton transit oriented development). Due to its prime location along Highway 50 and Folsom Boulevard, its proximity to several light rail stations, and its location between major employment centers in Rancho Cordova and Folsom (and Aerojet itself), Glenborough is forecasted in the MTP/SCS to build 3,262 new housing units and 1,556 new jobs – virtually all of its capacity – by 2035. Residential densities of this Developing Community average 8 units per acre; employment land uses include commercial, office and supporting public uses.

Rural Residential Communities in unincorporated Sacramento County are expected to experience low amounts of growth, approximately 632 new housing units and 2,284 new jobs by 2035. The MTP/SCS forecast assumes relatively small amounts of new rural residential homes to be constructed in the region by 2035. This is in part due to the current recession combined with changing demographics, which suggest a higher percent of the population will want and need to live on smaller lots or in attached homes near existing jobs, services, and with more transportation choices.

Sacramento County's draft general plan includes provisions that require projects in new developing communities outside of the UPA to meet criteria that are generally consistent with the principles of the Blueprint and this MTP/SCS. These criteria, which are expected to be included in the final document, will provide the county and the region additional flexibility as the MTP/SCS is updated and amended, since they will help to ensure that new growth included in the MTP/SCS performs well in terms of vehicle miles traveled, greenhouse gas and other air emissions, transit ridership, and bicycle and pedestrian trips. SACOG's regional monitoring program will pay particular attention to many outstanding growth issues in Sacramento County, including the rate at which development occurs in Centers and Corridors, Established Communities, and the many Developing Communities that already are entitled, the economic factors that will influence the rate of growth in these different community types, as well as how those growth rates may affect the economic condition of surrounding neighborhoods.

## SUTTER COUNTY

### *Live Oak*

Development in Live Oak is primarily suburban and rural-style housing development with small-scale employment and commercial uses along Highway 99. Consistent with most of the greater Sacramento area housing trend, Live Oak has grown substantially over the last ten years. The type of homes being built in the city continue to be predominantly traditional single-family homes in subdivisions. The city's recently updated general plan aims to maintain the small-town character of Live Oak, promote a balance of jobs, housing and services, and revitalize the existing downtown area. As a result, most of the city is characterized an Established Community in the MTP/SCS, the exception being the Highway 99 corridor which is a Center and Corridor Community. Within these two communities, the city has an estimated capacity for an additional 3,653 new employees and 2,287 new housing units. Additionally, the city's general plan includes a significant amount of new housing and employment capacity in the city's SOI area. Recently, the city annexed additional employment properties to help encourage economic development in the city. However, for a number of reasons, including the lower regional growth forecast, the SOI area is not identified for development within the current MTP/SCS planning period.

In total, the MTP/SCS forecast for Live Oak includes 848 new employees and 1,305 new housing units. Just over half of this new employment growth is in Established Communities. Most of this is in the form of new neighborhood supporting retail and commercial uses as well as new public uses. The majority of the housing growth, 97 percent, is in Established Communities and is largely building out many of the newer existing subdivision. The remaining housing and employment growth comes from Center and Corridor Communities. This Center and Corridor growth of 38 new housing units and 411 new employees is primarily medium density housing and commercial, office, and light industrial uses.

Issues to track through the regional monitoring program include whether regional market pressures for more housing in Live Oak return once the economy starts growing again and whether the planned improvements to the levee system are constructed, as expected, by 2015.

### *Yuba City*

As the county seat, Yuba City functions as the trading and service center for the surrounding agricultural area and maintains a solid balance of jobs and housing. Today the city is about 74 percent built out in its employment capacity and 78 percent built out in its housing capacity. As such, most of the city is an Established Community in the MTP/SCS. The exception is the city's downtown area and the commercial area centered on Highway 20 and Highway 99. This area is characterized as a Center and Corridor Community in the MTP/SCS. Most of the additional capacity in the existing city limits is the Established Community areas, where 11,806 new jobs and 5,587 new housing units could be accommodated. The majority of this employment capacity is in commercial and industrial uses, while the housing growth is largely building out newer existing subdivisions. The Center and Corridor Community area has capacity for an additional 416 new homes and 2,447 new jobs to be added to the city at build out. These jobs are also mainly commercial and industrial uses. The housing in this area is mostly medium-high density. Just outside the city limits, along the east side of Highway 99, some established low density residential development exists. This area is considered an Established Community in the MTP/SCS forecast for Yuba City as the area is supported by city services even though it has not been annexed into the city. Directly adjacent on the west side of Highway 99, just outside of the city limits, new housing and employment uses are planned. This area is a Developing Community in the MTP/SCS. Employment uses will include commercial, office, and industrial uses while the residential uses planned are low and medium density, averaging eight units per acre. At build out this area could include a total of 484 jobs and 1,019 housing units. The city's recently adopted general plan acknowledges and plans for future growth to occur primarily through village-style development in its sphere of influence. As part of general plan implementation, the city developed a new specific plan for the portion of the SOI located near the southwest corner of the existing city limits. This adopted specific plan, Lincoln East, is the second Developing Community in Yuba City including in the MTP/SCS. This plan is for a new mixed-use community which would include 4,866 housing units averaging 8 units per acre and new neighborhood serving commercial and public facilities. The remaining SOI area has an additional housing and employment capacity; however, these areas are not identified for development within this MTP/SCS planning period.

Moderate, balanced growth is anticipated for Yuba City through 2035. The city is expected to maintain its share of the regional housing and employment and it's well balanced jobs-housing ratio through 2035. The MTP/SCS forecast for Yuba City includes 9,178 new jobs and 6,816 new housing units. The majority of this growth, about 75 percent of the employment and 72 percent of the housing, is in Established Communities. As noted above, this employment growth is primarily commercial and industrial uses and the residential growth is primarily building out newer existing subdivisions. The Center and Corridor Community includes 1,972 new jobs and 394 new housing units in the MTP/SCS. Most of this is through infill; however, a small percentage of redevelopment is assumed in this area by 2035. The remaining growth comes from Developing Communities in the SOI area. The area around Highway 99 includes 662 new units and 360 new jobs in the MTP/SCS. Lincoln East includes 819 new housing units by 2035. Primarily due to market, infrastructure, and potential flood constraints, these Developing Communities are not likely to begin building until the later years of the plan, post 2020. The growth within the current city limits; however, is likely to get 44 percent of its 2035 housing growth and 25 percent of its employment growth by 2020. This housing growth rate in the early portion of the plan is higher than the regional average of 39 percent of new 2035 housing units by 2020, because much of this growth is in approved and currently building subdivisions. The 25 percent employment growth by 2020 is slower than the regional average in part due to high vacancy rates in commercial and industrial uses regionally.

Issues to track through the regional monitoring program include progress on planned levee improvements and whether the return of a strong regional economy leads to more market pressures for housing growth in the city, and how that dynamic may be affected by planned development in southern Sutter County.

### *Sutter (Unincorporated County)*

Development activity in unincorporated Sutter County has historically been focused in the spheres of influence of Live Oak and Yuba City and to a lesser extent in a number of smaller rural towns throughout the unincorporated area. These towns, Sutter, Meridian, Robbins, Tudor, Nicolas, East Nicolas, and Rio Oso make up the Established Communities in unincorporated Sutter County. The county has one large new growth area, located on the Sacramento-Sutter County line along Highway 99. This new growth area has an adopted specific plan, the Sutter Pointe Specific Plan. This is a Developing Community in the MTP/SCS. The county's recently adopted updated general plan directs most new growth to these areas and aims to preserve much of the county in agricultural uses. The county general plan does identify two new commercial/industrial employment areas in the county, one north of Yuba City and one south. These areas will be re-zoned for employment uses in the near future. These areas, and the remaining areas in the unincorporated county, are not identified for development in the MTP/SCS. However, agricultural related housing and employment is likely to occur in these areas and is supported by the MTP/SCS environmental sustainability policies.

The South Sutter Developing Community represents almost all of the employment and housing capacity in the county. At build out, this plan includes 17,503 housing units and 55,018 employees. The majority of these employment uses are industrial though the plan does also include commercial and public uses. The average residential density planned is eight units per acre. While the MTP/SCS forecast includes 95 percent of the county's new employment and 84 percent of the new housing to occur within this Developing Community by 2035, that growth represents only a small portion of the build out capacity in the specific plan. The MTP/SCS forecast includes 2,598 new employees and 4,157 new housing units in unincorporated Sutter County by 2035. Of this, 2,477 employees and 3,475 housing units are in South Sutter. The remaining 121 jobs and 682 housing units in the MTP/SCS forecast are located in Established Communities where continued low density development and neighborhood serving commercial and public uses are planned. Developing in the South Sutter area is most likely to occur in the latter portion of the planning period because there are some barriers to development occurring in the near term, primarily infrastructure issues related to water and sewer service that need to be addressed. Because the South Sutter Specific Plan area is not likely to begin building until later in the planning period and because the MTP/SCS does not forecast new agricultural employment, the MTP/SCS forecast includes only one percent of its 2035 employment growth and nine percent of the 2035 housing growth by 2020.

The regional monitoring program will track the extent to which infrastructure cost challenges are resolved for Sutter Pointe, as well as the timing of construction of other developments in the north part of the region that might compete with Sutter Pointe for market share. These issues could affect the pace of growth in Sutter Pointe, either increasing or decreasing it compared to projections in this MTP/SCS plan cycle.

## YOLO COUNTY

### *Davis*

As of 2008, the City of Davis is largely built out per the city's general plan, adopted in 2001. Most of the city is characterized as Established Community in the MTP/SCS, with the exception being the area within a half mile of the existing Amtrak station, which is a Center and Corridor Community. Covered in this Center and Corridor Community is also the downtown, for which the city has a Core Area Strategy and Specific Plan that promote economic development of the area, and a portion of the city's SOI, the 44 acre Nishi property, which is envisioned by the City Council as a potential mixed-use development with high density housing and light-industrial and office uses. However, as this site is designated with an agricultural land use in the current general plan, it does require voter approval to change the land use designation. Measure R requires voter approval for proposed changes to agricultural land use designations. In total, the city has capacity to add 6,459 new jobs and 4,601 new housing units by build out. In addition to the Nishi site noted above, the city has a sphere of influence that includes areas to the north and south of the existing city limits. To the north, the SOI includes two areas along Highway 113, one area between County Road 101A and County Road 102, one area northeast of County Roads 105/30 (which consists of the Yolo County landfill and the City of Davis sewage treatment plan), and a fourth area just south of County Road 30B on the Mace curve. These areas consist of residential development in unincorporated Yolo County (Royal Oak, Willowbank, and El Macero). To the south, the SOI area includes three areas south of Interstate 80 and the UC Davis campus area. With the exception of the UC Davis campus, the MTP/SCS does not identify development in these SOI areas by 2035.

By 2035, the MTP/SCS forecast for Davis includes 4,183 new employees and 3,646 new housing units. The majority of this growth, 82 percent of the employment and 64 percent of the housing, is in Established Communities. The majority of this employment growth is in commercial, office, and industrial uses, primarily located along Highway 80. The new housing growth, ranging low and high density, is a result of small-scale infill throughout the city and one remaining large infill opportunity in the city, located along East Covell Boulevard and F Street. The remaining 764 new employees and 1,323 new housing units in Davis in the MTP/SCS forecast are in the Center and Corridor Community.

Due to its declining share of regional housing and supporting the city's goal to add more jobs, the city's jobs-housing ratio improves slightly from today. However, these figures do not include the dynamic of planned growth at the adjacent UC Davis campus because that growth is in unincorporated Yolo County. Twenty three percent of Davis' employment growth and 36 percent of the housing growth is forecast to occur by 2020 in the MTP/SCS. This is slower than the regional average for a number of reasons. First, the city's two largest remaining infill opportunities do not yet have specific plans adopted by City Council. The city has a policy that caps the number of housing units that can be permitted per year. In addition, the city's general plan has an expired horizon year of 2010.

Issues to track through the regional monitoring program include the success of the city in developing its remaining infill sites, the progress of planning for development at the Nishi property, and the success of the University in pursuing recently announced ambitious expansion plans and how that might affect the housing market in the area.

### *West Sacramento*

West Sacramento's heavy employment base has in recent years, shifted toward a more balanced mix of employment and housing. With the exception of the riverfront area, much of the northern half of the city has been developed. This portion of the city is characterized as an Established Community in the MTP/SCS. The city's Southport community is the main source of the recent housing development. Beginning development in 2001, only a small portion of the development potential in this area exists today. This area includes a number of approved developments that can be characterized into three villages and an industrial park. These areas, the Southwest Village, Southeast Village, Northeast Village and Southport Industrial Park, are Developing Communities in the MTP/SCS. However, portions of the Southwest Village and the Northeast Village that began building in early last decade are characterized as Established Communities. The Southwest Village of Southport will include 6,568 homes and 1,356 jobs at build out. New housing in this area will average ten units per acre. The Southeast Village will average 12 units per acre and will include 3,420 new housing units and 120 new jobs at build out. The remaining Northeast Village will include an additional 1,937 housing units, with an average density of eight units per acre, at build out. New employment in all three villages is primarily neighborhood serving commercial and public uses. The Southport Industrial Park is the last Developing Community. This area has slowly begun developing commercial and industrial uses, which at build out would include 4,968 jobs and 1,106 high density housing units. The city's long term vision for development also includes the areas directly north and south of the existing city limits. These areas are not identified for development in the current MTP/SCS planning period.

The city's most recent focus for development has been in mixed-use, higher density projects, along the riverfront. This includes the recently adopted Bridge District plan, the proposed Stone Lock District, and revitalization of the Washington Specific Plan area. These areas are characterized as Center and Corridor Communities in the MTP/SCS. The city has, over the last few years, also made a concerted effort to begin redevelopment and revitalization of the historic West Capitol Avenue corridor. With recent streetscape improvements, construction of a transit hub and new civic center, and newly adopted design guidelines, this area is also identified as a Center and Corridor Community in the MTP/SCS. Together these areas, all planned for a mix of high density housing and new commercial, office, industrial, and public uses, have the capacity to add 65,728 new jobs and 18,465 new housing units to the city at build out.

The MTP/SCS forecast for West Sacramento includes 20,839 new employees and 17,790 new housing units by 2035. The majority of this development, 66 percent of the employment and 62 percent of the housing units, are in infill and redevelopment opportunities within the Center and Corridor Communities. Due to its location directly across the Sacramento River from downtown Sacramento, and the type of development planned, this area of West Sacramento will become part of the urban core of the region in the future. This results in a one percent increase in the city's share of the regional housing and employment by 2035. Significant infrastructure exists or is currently under construction for this area. Established Communities include 3,570 new employees and 3,827 new housing units. Many of these new employees are in existing commercial and industrial centers. Most of the new housing is filling in existing subdivisions with some small amounts of infill.

A lesser amount of the new growth is forecast in the Developing Communities. For the three residentially-focused villages, this is due to potential flood issues. The area is currently being mapped by FEMA and, once completed, most of the Southport area could be moved into flood zones. This will constrain residential building until levee improvements can be made. As a result, the Southwest Village includes 1,715 new housing units and 271 new employees in the MTP/SCS forecast. The Southeast Village includes 708 new housing units and 23 new jobs and the Northeast Village 227 new housing units. The Southport Industrial Park is expected to grow by 3,170 employees and 234 housing units. Though this is only 15 percent of the forecast for employment growth in the city, this is building out 80 percent of the capacity in this area. The city, as a whole, is expected to grow very close to the regional average, experiencing most of its growth in the latter portion of the planning period.

Issues to track through the regional monitoring program include the potential impacts that flood, redevelopment and delta protection issues on the ability of the city to realize its growth plans. Depending on the final resolution of these issues the land use forecast for West Sacramento in future MTP/SCSs could be affected.

### *Winters*

Winters is a small city, surrounded by agricultural uses. Though the city is has capacity to double the amount of housing and triple the amount of employment it has today, it has deep historic roots as a community and is therefore is primarily characterized in the MTP/SCS as an Established Community. This includes the city's gateway, which is the focus of current planning efforts in the city today. This Established Community has the potential capacity to add 3,934 new jobs and 2,310 new housing units at build out. The city's Downtown Plan is a form-based code approach to guiding infill and redevelopment opportunities in the city's historic downtown. This area is a Center and Corridor Community in the MTP/SCS. Because growth in this area is likely to happen primarily through redevelopment, it is difficult to estimate the capacity for new housing and jobs and also even with several redevelopment opportunities, the net gain of housing units and employees could be small. The estimated capacity for this area could add 39 new jobs and 29 new housing units. The city has a sphere of influence that is north of the existing city limits. Due to current economic conditions and the remaining capacity within the city today, this area is not identified for development in the MTP/SCS.

The MTP/SCS forecast includes 1,126 new employees and 1,017 new housing units in Winters by 2035. All of this housing is in Established Communities, likely in the northern portion of the city where the newer residential growth has been concentrating. New residential growth is primarily low density, however can range from very low density to high density. A small amount of development is assumed in the Center and Corridor Community, adding 18 new employees. The remaining employment growth is in Established Communities. Most of this new employment is commercial and industrial uses at the gateway and along East Grant and Grant Avenue. The MTP/SCS forecast assumes that Winters is likely to see most of this growth in the latter half of the planning period, likely growing slower than the regional average. During the early part of the last decade, Winters was experiencing a lot of development proposals, most of it for new housing. It will likely take some time to begin to build that back up.

Issues to track the regional monitoring program include whether the city's successful downtown revitalization at some point will result in a significantly higher growth rate for the city. Its position on the edge of the region and proximity to the Bay Area creates the potential for unique growth dynamics in this city.

### *Woodland*

Due to its role as the county seat, and its location along Interstate 5, Woodland has maintained a strong ratio of jobs-to-housing. With about 78 percent of its housing capacity built today, most of the city is characterized as an Established Community in the MTP/SCS. Most of the new housing being built is in the Spring Lake Specific Plan area. This development is a Developing Community in the MTP/SCS. Woodland also has two Center and Corridor Communities in the MTP/SCS. Woodland's adopted East Street Specific Plan and downtown redevelopment plan are intended to guide and encourage revitalization and development in the older parts of the city, which make up these Center and Corridor Communities. Over the last several years, the city has seen a number of new development projects in this area. Woodland voters also approved the creation of an urban limit line to help preserve agricultural lands on the city's urban fringe so these areas are not identified for development in the MTP/SCS.

By 2035, the MTP/SCS forecast includes 7,125 new jobs and 5,231 new housing units in Woodland. Established Communities include 5,971 of the new jobs and 982 of the new housing units. Because the city's residential lands in these areas are largely built out today, most of this housing growth is in scattered infill throughout the city, almost building out the 1,055 units of potential capacity. The city's Established Communities include several existing job centers where industrial and commercial uses are concentrated. These areas have the potential to add 30,127 new jobs at build out. While the MTP/SCS assumes only 20 percent of this capacity is likely to be built by 2035, it is a significant amount of employment, accounting for 84 percent of the city's total employment growth in the MTP/SCS. Center and Corridor Communities also come close to reaching their build out potential for new housing in the MTP/SCS. The MTP/SCS forecast includes 741 new housing units in this area, capacity being estimated for 750 new housing units. These Center and Corridor Communities also add a small amount of new jobs. The development in these areas in the MTP/SCS is primarily residential and commercial mixed-use with medium to high density housing. Consistent with the city's plans in this area and recent trends, the MTP/SCS includes some redevelopment in this area, which may contribute to the net employment gain being less than the housing growth for the area. Most of the new residential growth, 3,508 new housing units and 1,127 new employees are in Spring Lake. This area is currently building today and is expected to be built out by 2035. It includes new neighborhood serving commercial and public uses and a variety of new housing, with an average density of 8 units per acre. Woodland is expected to grow faster in the early years of the MTP/SCS than the regional average, with 44 percent of its 2035 housing and employment growth forecast by 2020. This is largely due to the expected continuation of commercial and industrial growth along Interstate 5 and the residential building in Spring Lake.

Issues to track through the regional monitoring program include the potential impacts of restricted redevelopment powers and commercial development on Interstate 5 on planned development rates in the downtown.

### *Yolo (Unincorporated County)*

Yolo County is the western edge of the Sacramento region, and an important part of the Interstate 80 corridor linking Sacramento to the Bay Area. The county, despite increased pressure for development, has remained largely an agricultural resource area with most growth occurring in its incorporated cities and unincorporated towns. This commitment to agriculture and preserving the county's rural character has been re-enforced with the city's recently updated general plan. The updated general plan follows the same principles as the previous plan and directs all residential growth to designated areas within the cities and within the growth boundaries of existing unincorporated communities (with the exception of farm dwellings). Yolo County also has a pass through agreement with its cities whereby urban development is directed to cities and the cities "pass through" a portion of the tax increment from their redevelopment districts to the county. Additionally, development pressures on the prime farmland between Davis and Woodland, have led to these two cities and the county entering an agreement to preserve this land for agriculture. This is further supported by the urban growth boundaries both cities have. Growth in unincorporated Yolo County is directed to the existing unincorporated towns of Capay, Clarksburg, Dunnigan, Esparto, Knights Landing, Madison, Monument Hills, Yolo, and Zamora. These communities are characterized as Established Communities in the MTP/SCS. The towns of Dunnigan, Esparto, Knights Landing, and Madison have the majority of the new housing potential. Dunnigan, specifically, is expected to have a new specific plan completed that could include 8,000 new housing units. This proposed specific plan is not yet adopted and is not identified for development in the current MTP/SCS planning period. The remaining agricultural and natural resource areas of the county area also not identified for development in the MTP/SCS. However, agricultural related housing and employment is likely to occur in these areas and is supported by the MTP/SCS environmental sustainability policies. UC Davis is located in the county, just south of Davis, and is characterized in the MTP/SCS as a Center and Corridor Community.

The MTP/SCS forecast for unincorporated Yolo County includes 5,368 new jobs and 2,890 new housing units. Of this growth, 2,939 new jobs and 1,751 new housing units are at UC Davis, building out the Long Range Development Plan (LRDP) for the University. The remaining 2,429 new jobs and 1,139 new homes are in Established Communities, building out 16 percent of the area employment growth capacity and 24 percent of the housing growth capacity. These new housing units are largely low density; however, a range of densities from very low to high density are planned. New jobs come primarily from new commercial, industrial and public uses. The MTP/SCS does not forecast new agricultural employment of farm dwellings, both of which are likely to continue to grow in Yolo County. By 2020, the MTP forecast includes 25 percent of the unincorporated county's 2035 employment growth and 75 percent of the 2035 housing growth to occur. Employment growth is expected to happen a little slower than the regional average of 28 percent of new 2035 employees by 2020. Conversely the housing growth is happening much faster than the regional average of 39 percent of 2035 housing growth by 2020. This is largely because the UC Davis LRDP expects build out of all new housing by 2020.

Issues to track through the regional monitoring program include UC Davis's growth plans and how the county and the city Davis may respond. The University is emerging as an even more major player in the region's economic development future.

## YUBA COUNTY

### *Marysville*

The City of Marysville has historically maintained a compact footprint due in large part to significant flood constraints. Today, Marysville is substantially built out within its existing city limits, with limited opportunities for growth through infill and redevelopment. Marysville adopted a Downtown Strategic Plan in 2004 to facilitate this type of development and has seen a number of development projects initiated in the downtown since plan adoption. This area of the city is characterized as a Center and Corridor Community while the remaining city is considered an Established Community.

The MTP/SCS 2035 growth forecast for Marysville projects that the city builds most of its housing and employment capacity. By 2035, the MTP/SCS forecast includes 1,016 new employees and 457 new housing units. Beyond this the general plan capacity could add an additional 39 employees and 64 housing units. The majority of this growth, 62 percent of the new employment and 77 percent of the new housing, is expected to occur in Established Communities through infill development. The remaining growth is expected to occur in the Center and Corridor Community area through infill and small amounts of redevelopment. The city is expected to grow significantly slower than the regional average during the first half of the planning period. This is primarily due to flood constraints and the general job market weakness in the region currently.

Issues that will be tracked through the regional monitoring program that may influence future land use projections for Marysville include the ultimate fate of local redevelopment authority as well as the amount of growth that occurs in unincorporated Yuba County immediately to the city's south. The construction of major transportation projects such as the planned improved bridge access to Yuba City and possibly some form of bypass around the City may also influence future growth in the city.

### *Wheatland*

Wheatland is a small city along Highway 65 that in the last decade has experienced accelerated housing growth as workers in Placer County have moved north along the Highway 65 corridor to find housing. The city recently completed an update of its general plan, which addresses the prospect of continued growth. The northern and eastern portion of the city, where most of the newer residential activity has happened in the last decade, is considered an Established Community in the MTP/SCS. The city's existing downtown area is characterized as a Center and Corridor Community. Within the existing city limits, there remain significant areas available for greenfield development and the city has recently annexed part of its sphere of influence for one of a number of approved residential subdivisions. These areas are Developing Communities in the MTP/SCS. Adjacent to the northeast portion of the city, in the city's SOI area is the recently adopted Nichols Grove Specific Plan area. This area is also considered a Developing Community in the MTP/SCS. The city has a large SOI area that includes a significant amount of additional housing and employment growth planned; however, these areas are not identified for development within the current MTP/SCS planning period.

The MTP/SCS forecast for Wheatland includes 927 new employees and 1,165 new housing units by 2035. Of this growth, 219 employees and 134 housing units are in Established Communities. This growth is primarily the continued build out of existing newer subdivisions and new neighborhood serving commercial and public uses. At build out, these Established Communities have the potential to add an additional 44 employees and 389 housing units. Most of the new growth, about 76 percent of the new employees and 88 percent of the new housing units are in Developing Communities. The approved Developing Communities in the existing city limits account for 465 new employees and 597 new housing units. These employees are primarily from commercial and employment uses. The housing growth is expected to continue the trend for low density units, averaging 6 units per acre. Building out capacity of these areas could add an additional 175 employees and 690 housing units beyond the MTP/SCS forecast. The Nichols Grove Specific Plan includes 1,612 new housing units and 243 new employees at build out. These housing units average eight units per acre and these employees are primarily from neighborhood commercial and public uses. The MTP/SCS assumes this development begins later in the planning period and therefore forecasts 430 new housing units and 243 new employees by 2035. About 45 percent of the city's 2035 housing growth is expected by 2020. This is due to the continued building of approved subdivisions. Conversely only 12 percent of the city's 2035 employment growth is anticipated by 2020. This is because much of the employment growth is new neighborhood serving commercial and public uses.

Issues to track through the regional monitoring program include the potential effect of flood protection issues in the city's northwest quadrant and the extent to which residential pressures from the Placer County employment center to the south return once the economic starts growing again.

### *Yuba (Unincorporated County)*

While historically a rural, agricultural county, unincorporated Yuba County approved several specific plans in the 1990s that began developing in earnest in the last ten years. The county recently adopted an updated general plan. This general plan categorizes the housing development in the county into two main categories, Valley Neighborhood and Rural Community. Rural Communities include the communities of Hallwood, Browns Valley, Loma Rica, Oregon House, Dobbins, Rackerby, Brownsville, Challenge, Log Cabin, Camptonville, Strawberry Valley, Smartsville, and Camp Far West. The general plan policies support the continued rural character of these communities and therefore they are characterized in the MTP/SCS as Rural Residential Communities. The Valley Neighborhood areas include the existing communities of Linda and Olivehurst as well as the newer growth areas of Plumas Lake, East Linda, and the North Arboga Study Area. Linda and Olivehurst are characterized as Established Communities in the MTP/SCS. Beale Air Force Base, the only active military base in the region and the largest employer in the Yuba-Sutter sub-region, is also an Established Community in the MTP/SCS. The three newer growth areas, where the majority of the housing development has occurred in the unincorporated county in recent years, Plumas Lake, North Arboga and East Linda are Developing Communities. The county's updated general plan also establishes a Valley Growth Boundary and places a focus on economic development opportunities within the boundary, demonstrating the county's commitment to trying to provide more job opportunities for residents who would otherwise likely be commuting to Placer or Sacramento for work. As such, the general plan identifies a new employment center along Highway 65. This area is also identified as a Developing Community in the MTP/SCS. The general plan identifies mixed-use corridors along North Beale Road and Olivehurst Avenue. These are areas where the county envisions infrastructure improvements to encourage development and redevelopment. Land uses would include commercial, public, and medium to high density housing, including mixed-use. These areas are identified in the MTP/SCS as Center and Corridor Communities. The remaining areas in the county are identified as planning reserve or natural resources in the general plan. These areas are not identified for development in the MTP/SCS planning period.

Developing Communities represent that largest amount of housing and employment capacity in the unincorporated county. In total the county has capacity for 27,735 new housing units and new 55,722 employees. Around 78 percent of that housing and 88 percent of that employment capacity is in Developing Communities. Plumas Lake, the Developing Community located along Highway 70 has started building in recent years and has the potential to add another 14,329 new homes and 19,664 new jobs at build out. This community includes a mix of housing and employment uses with housing densities averaging five units per acre and employment uses including commercial, office, light industrial and public. Adjacent to the northern border of Plumas Lake is the North Arboga plan area. This plan has capacity to add an additional 1,519 new housing units and 2,273 new jobs at build out. It includes commercial, industrial and public uses and an average residential density of four units per acre. Until very recently, these two Developing Communities were affected by flood issues from the Feather River. However, recently completed levee improvement and FEMA accredited 100-year protection now allows these areas to build with no elevation or flood insurance requirements. East Linda, located adjacent to the existing town of Linda, also began developing recently. This area, at build out, could add commercial, industrial and public uses generating an additional 3,681 employees and 4,261 new housing units, averaging six units per acre, to what exists today. The Highway 65 Employment Area has potential to add 23,550 new employees at build out. This area is planned for a wide variety of employment uses, including regional commercial, light and heavy industrial, agricultural processing, office, and public uses. Recently, the federal government approved an American Indian tribe's plan to build a casino in this area. Predominately an employment only Developing Community, the MTP/SCS does not forecast residential development in this area. However, the general plan does allow for up to 4,000 new housing units in this area, if such uses contribute to, or construct infrastructure needed to serve the primary employment-generating uses. Established Communities have capacity to add 5,388 new housing units and 3,292 employees at build out. Beale AFB has potential to add an unknown number of employees. Having recently been awarded a new mission, with other future potential missions, the MTP/SCS assumes this area could add 1,792 employees. Center and Corridor Communities have a build out potential that could add 137 new homes and 935 new jobs.

The MTP/SCS forecast for unincorporated Yuba County includes 9,914 new housing units and 10,737 new jobs by 2035. The majority of this new growth is expected to occur in Developing Communities with 4,577 new housing units and 2,999 new employees in Plumas Lake, 2,855 new housing units and 1,267 new employees in East Linda, 282 new housing units in North Arboga, and 2,507 new employees in the new Highway 65 employment area. The remaining 37 percent of employee growth and 22 percent of housing growth in the MTP/SCS is in Established Communities, Center and Corridor Communities, and Rural Residential Communities. Established Communities include 3,077 new employees and 1,983 new housing units. The majority of these new jobs are likely on Beale AFB while the remaining commercial, industrial, and employment uses are located in the Linda and Olivehurst area, primarily along Highway 65. The MTP/SCS assumes some mixed use development; including a very small number of redevelopment sites in Center and Corridor Communities. This development adds 352 new employees and 136 new housing units by 2035. Rural Residential Communities in unincorporated Yuba County are expected to experience low amounts of growth, approximately 101 new housing units and 535 new jobs by 2035. The MTP/SCS forecast assumes relatively small amounts of new rural residential homes to be constructed in the region by 2035. This is in part due to the current recession combined with changing demographics, which suggest a higher percent of the population will want and need to live on smaller lots or in attached homes near existing jobs, services, and with more transportation choices. This is also supportive of the county's new Valley Growth Boundary which aims to guide the majority of the counties long term growth into the Center and Corridor Communities, Established Communities, and Developing Communities.

By 2035, the county's share of regional employment growth increases from today and their share of the regional housing market remains constant. The county's share of regional employment is expected to increase from 1.5 percent today, to about 2 percent in 2035. However, because much of this employment growth is dependent on development of the Highway 65 Employment Area, which has significant infrastructure challenges to address, most of this employment is expected to occur later in the planning period. Only 20 percent of the new 2035 employment is forecast to occur by 2020. Conversely, 54 percent of the county's 2035 housing growth is forecast by 2020. This is significantly higher than the regional average due to the fact that Plumas Lake, North Arboga, and East Linda are entitled to develop and have a high number of vacant lots that are ready to build as soon as the market returns.

The regional monitoring program will track the level to which the county succeeds in its desire to have jobs rather than housing lead its future growth. The success of establishing the Highway 65 employment center, together with the future of Beale, will be the primary drivers of future employment growth and are top local priorities.

| 2020 and 2035 MTP/SCS Land Use Forecast by Community Type and Jurisdicition | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Existing Conditions 2008 | | MTP/SCS 2020 Total | | MTP/SCS 2035 Total | | MTP/SCS 2020 Growth | | MTP/SCS 2035 Growth | |
| Jurisdiction/Community Type | Total Employees | Total Housing Units | Total Employees | Total Housing Units | Total Employees | Total Housing Units | Employee Growth | Housing Unit Growth | Employee Growth | Housing Unit Growth |
| EL DORADO COUNTY | | | | | | | | | | |
| **Placerville** | | | | | | | | | | |
| Corridor/Center Communities | 4,027 | 99 | 4,111 | 119 | 4,247 | 176 | 84 | 20 | 220 | 77 |
| Established Communities | 6,561 | 4,191 | 6,807 | 4,605 | 7,165 | 5,221 | 246 | 414 | 604 | 1,030 |
| **Placerville Total** | **10,588** | **4,290** | **10,918** | **4,724** | **11,412** | **5,397** | **330** | **434** | **824** | **1,107** |
| **Unincorporated El Dorado County** | | | | | | | | | | |
| Corridor/Center Communities | 3,557 | 66 | 3,765 | 81 | 3,992 | 81 | 208 | 15 | 435 | 15 |
| Established Communities | 20,600 | 29,169 | 25,403 | 31,066 | 35,525 | 35,367 | 4,803 | 1,897 | 14,925 | 6,198 |
| Developing Communities | 5,089 | 4,938 | 5,283 | 7,245 | 5,780 | 10,045 | 194 | 2,307 | 691 | 5,107 |
| Rural Residential Communities | 4,930 | 23,327 | 5,002 | 23,633 | 5,700 | 23,722 | 72 | 306 | 770 | 395 |
| **Unincorporated El Dorado Total** | **34,176** | **57,500** | **39,453** | **62,025** | **50,997** | **69,215** | **5,277** | **4,525** | **16,821** | **11,715** |
| EL DORADO COUNTY TOTAL | 44,764 | 61,790 | 50,371 | 66,749 | 62,409 | 74,612 | 5,607 | 4,959 | 17,645 | 12,822 |
| | | | | | | | | | | |
| PLACER COUNTY | | | | | | | | | | |
| **Auburn** | | | | | | | | | | |
| Corridor/Center Communities | 2,735 | 511 | 2,818 | 548 | 2,943 | 798 | 83 | 37 | 208 | 287 |
| Established Communities | 6,247 | 5,855 | 6,406 | 6,024 | 6,883 | 6,215 | 159 | 169 | 636 | 360 |
| Developing Communities | 0 | 5 | 57 | 201 | 63 | 719 | 57 | 196 | 63 | 714 |
| **Auburn Total** | **8,982** | **6,371** | **9,281** | **6,773** | **9,889** | **7,732** | **299** | **402** | **907** | **1,361** |
| **Colfax** | | | | | | | | | | |
| Corridor/Center Communities | 684 | 140 | 753 | 140 | 1,280 | 226 | 69 | 0 | 596 | 86 |
| Established Communities | 303 | 674 | 356 | 744 | 366 | 768 | 53 | 70 | 63 | 94 |
| **Colfax Total** | **987** | **814** | **1,109** | **884** | **1,646** | **994** | **122** | **70** | **659** | **180** |
| **Lincoln** | | | | | | | | | | |
| Corridor/Center Communities | 1,133 | 49 | 1,187 | 50 | 1,208 | 115 | 54 | 1 | 75 | 66 |
| Established Communities | 6,853 | 17,632 | 8,160 | 20,321 | 11,607 | 21,559 | 1,307 | 2,689 | 4,754 | 3,927 |
| Developing Communities | 1,538 | 86 | 3,885 | 1,696 | 6,672 | 7,368 | 2,347 | 1,610 | 5,134 | 7,282 |
| **Lincoln Total** | **9,524** | **17,767** | **13,232** | **22,067** | **19,487** | **29,042** | **3,708** | **4,300** | **9,963** | **11,275** |
| **Loomis** | | | | | | | | | | |
| Corridor/Center Communities | 450 | 149 | 683 | 218 | 1,163 | 598 | 233 | 69 | 713 | 449 |
| Established Communities | 3,126 | 1,463 | 3,151 | 1,551 | 3,237 | 1,878 | 25 | 88 | 111 | 415 |
| Rural Residential Communities | 660 | 783 | 693 | 809 | 783 | 857 | 33 | 26 | 123 | 74 |
| **Loomis Total** | **4,236** | **2,395** | **4,527** | **2,578** | **5,183** | **3,333** | **291** | **183** | **947** | **938** |
| **Rocklin** | | | | | | | | | | |
| Corridor/Center Communities | 1,167 | 907 | 1,304 | 1,045 | 1,585 | 1,882 | 137 | 138 | 418 | 975 |
| Established Communities | 15,791 | 19,992 | 17,278 | 20,950 | 18,857 | 21,533 | 1,487 | 958 | 3,066 | 1,541 |
| Developing Communities | 353 | 1,031 | 2,677 | 4,437 | 5,997 | 4,873 | 2,324 | 3,406 | 5,644 | 3,842 |
| **Rocklin Total** | **17,311** | **21,930** | **21,259** | **26,432** | **26,439** | **28,288** | **3,948** | **4,502** | **9,128** | **6,358** |
| **Roseville** | | | | | | | | | | |
| Corridor/Center Communities | 6,924 | 2,191 | 7,749 | 2,530 | 9,102 | 2,887 | 825 | 339 | 2,178 | 696 |
| Established Communities | 62,078 | 43,320 | 69,659 | 44,847 | 80,585 | 46,499 | 7,581 | 1,527 | 18,507 | 3,179 |
| Developing Communities | 70 | 1,229 | 1,426 | 9,063 | 7,865 | 15,516 | 1,356 | 7,834 | 7,795 | 14,287 |
| **Roseville Total** | **69,072** | **46,740** | **78,834** | **56,440** | **97,552** | **64,902** | **9,762** | **9,700** | **28,480** | **18,162** |
| **Unincorporated Placer County** | | | | | | | | | | |
| Established Communities | 23,206 | 16,404 | 27,636 | 17,201 | 37,349 | 19,090 | 4,430 | 797 | 14,143 | 2,686 |
| Developing Communities | 93 | 164 | 949 | 3,966 | 3,579 | 13,187 | 856 | 3,802 | 3,486 | 13,023 |
| Rural Residential Communities | 8,251 | 24,053 | 8,406 | 24,818 | 8,593 | 26,143 | 155 | 765 | 342 | 2,090 |
| **Unincorporated Placer County Total** | **31,550** | **40,621** | **36,991** | **45,985** | **49,521** | **58,420** | **5,441** | **5,364** | **17,971** | **17,799** |
| PLACER COUNTY TOTAL | 141,662 | 136,638 | 165,233 | 161,159 | 209,717 | 192,711 | 23,571 | 24,521 | 68,055 | 56,073 |

| 2020 and 2035 MTP/SCS Land Use Forecast by Community Type and Jurisdicition | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Existing Conditions 2008 | | MTP/SCS 2020 Total | | MTP/SCS 2035 Total | | MTP/SCS 2020 Growth | | MTP/SCS 2035 Growth | |
| Jurisdiction/Community Type | Total Employees | Total Housing Units | Total Employees | Total Housing Units | Total Employees | Total Housing Units | Employee Growth | Housing Unit Growth | Employee Growth | Housing Unit Growth |
| SACRAMENTO COUNTY | | | | | | | | | | |
| **Citrus Heights** | | | | | | | | | | |
| Corridor/Center Communities | 7,674 | 1,616 | 8,243 | 1,661 | 10,330 | 2,886 | 569 | 45 | 2,656 | 1,270 |
| Established Communities | 11,557 | 34,522 | 11,863 | 35,274 | 13,440 | 37,012 | 306 | 752 | 1,883 | 2,490 |
| **Citrus Heights Total** | **19,231** | **36,138** | **20,106** | **36,935** | **23,770** | **39,898** | **875** | **797** | **4,539** | **3,760** |
| **Elk Grove** | | | | | | | | | | |
| Corridor/Center Communities | 939 | 69 | 939 | 69 | 939 | 69 | 0 | 0 | 0 | 0 |
| Established Communities | 25,056 | 44,428 | 26,570 | 45,061 | 34,055 | 46,860 | 1,514 | 633 | 8,999 | 2,432 |
| Developing Communities | 849 | 774 | 4,642 | 7,723 | 11,039 | 13,325 | 3,793 | 6,949 | 10,190 | 12,551 |
| Rural Residential Communities | 1,586 | 3,747 | 1,586 | 4,512 | 1,586 | 5,756 | 0 | 765 | 0 | 2,009 |
| **Elk Grove Total** | **28,430** | **49,018** | **33,737** | **57,365** | **47,619** | **66,010** | **5,307** | **8,347** | **19,189** | **16,992** |
| **Folsom** | | | | | | | | | | |
| Corridor/Center Communities | 9,084 | 1,421 | 10,159 | 2,014 | 10,833 | 2,186 | 1,075 | 593 | 1,749 | 765 |
| Established Communities | 25,732 | 24,435 | 29,297 | 26,838 | 35,996 | 27,230 | 3,565 | 2,403 | 10,264 | 2,795 |
| Developing Communities | 0 | 1 | 47 | 2,313 | 1,291 | 6,688 | 47 | 2,312 | 1,291 | 6,687 |
| **Folsom Total** | **34,816** | **25,857** | **39,503** | **31,165** | **48,120** | **36,104** | **4,687** | **5,308** | **13,304** | **10,247** |
| **Galt** | | | | | | | | | | |
| Corridor/Center Communities | 1,977 | 303 | 2,583 | 392 | 2,804 | 481 | 606 | 89 | 827 | 178 |
| Established Communities | 2,882 | 7,481 | 3,136 | 8,204 | 4,960 | 9,322 | 254 | 723 | 2,078 | 1,841 |
| Developing Communities | 249 | 205 | 249 | 205 | 385 | 1,091 | 0 | 0 | 136 | 886 |
| **Galt Total** | **5,108** | **7,989** | **5,968** | **8,801** | **8,149** | **10,894** | **860** | **812** | **3,041** | **2,905** |
| **Isleton** | | | | | | | | | | |
| Established Communities | 115 | 352 | 128 | 378 | 159 | 443 | 13 | 26 | 44 | 91 |
| **Isleton Total** | **115** | **352** | **128** | **378** | **159** | **443** | **13** | **26** | **44** | **91** |
| **Rancho Cordova** | | | | | | | | | | |
| Corridor/Center Communities | 17,023 | 6,132 | 17,824 | 6,649 | 20,469 | 10,956 | 801 | 517 | 3,446 | 4,824 |
| Established Communities | 37,926 | 16,470 | 43,048 | 17,748 | 53,670 | 18,182 | 5,122 | 1,278 | 15,744 | 1,712 |
| Developing Communities | 146 | 2,267 | 1,235 | 8,423 | 7,332 | 21,085 | 1,089 | 6,156 | 7,186 | 18,818 |
| **Rancho Cordova Total** | **55,095** | **24,869** | **62,107** | **32,820** | **81,471** | **50,223** | **7,012** | **7,951** | **26,376** | **25,354** |
| **City of Sacramento** | | | | | | | | | | |
| Corridor/Center Communities | 170,884 | 59,202 | 182,501 | 73,508 | 210,637 | 102,301 | 11,617 | 14,306 | 39,753 | 43,099 |
| Established Communities | 115,093 | 132,297 | 126,861 | 143,983 | 150,315 | 153,329 | 11,768 | 11,686 | 35,222 | 21,032 |
| Developing Communities | 0 | 0 | 241 | 1,626 | 2,123 | 5,077 | 241 | 1,626 | 2,123 | 5,077 |
| **Sacramento Total** | **285,977** | **191,499** | **309,603** | **219,117** | **363,075** | **260,707** | **23,626** | **27,618** | **77,098** | **69,208** |
| **Unincorporated Sacramento County** | | | | | | | | | | |
| Corridor/Center Communities | 84,045 | 23,483 | 88,770 | 29,186 | 114,286 | 47,170 | 4,725 | 5,703 | 30,241 | 23,687 |
| Established Communities | 95,579 | 173,794 | 103,610 | 177,707 | 124,251 | 182,709 | 8,031 | 3,913 | 28,672 | 8,915 |
| Developing Communities | 4,842 | 7,846 | 6,802 | 13,856 | 11,517 | 25,793 | 1,960 | 6,010 | 6,675 | 17,947 |
| Rural Residential Communities | 9,298 | 13,440 | 9,476 | 13,652 | 11,582 | 14,072 | 178 | 212 | 2,284 | 632 |
| **Unincorporated Sacramento Total** | **193,764** | **218,563** | **208,658** | **234,401** | **261,636** | **269,744** | **14,894** | **15,838** | **67,872** | **51,181** |
| **SACRAMENTO COUNTY TOTAL** | **622,536** | **554,285** | **679,810** | **620,982** | **833,999** | **734,023** | **57,274** | **66,697** | **211,463** | **179,738** |
| | | | | | | | | | | |
| SUTTER COUNTY | | | | | | | | | | |
| **Live Oak** | | | | | | | | | | |
| Corridor/Center Communities | 467 | 47 | 601 | 57 | 878 | 85 | 134 | 10 | 411 | 38 |
| Established Communities | 592 | 2,454 | 690 | 2,959 | 1,029 | 3,721 | 98 | 505 | 437 | 1,267 |
| **Live Oak Total** | **1,059** | **2,501** | **1,291** | **3,016** | **1,907** | **3,806** | **232** | **515** | **848** | **1,305** |
| **Yuba City*** | | | | | | | | | | |
| Corridor/Center Communities | 8,064 | 1,518 | 8,571 | 1,699 | 10,036 | 1,912 | 507 | 181 | 1,972 | 394 |
| Established Communities | 17,156 | 22,509 | 18,955 | 25,302 | 24,002 | 27,450 | 1,799 | 2,793 | 6,846 | 4,941 |
| Developing Communities | 397 | 268 | 397 | 268 | 757 | 1,749 | 0 | 0 | 360 | 1,481 |
| **Yuba City Total** | **25,617** | **24,295** | **27,923** | **27,269** | **34,795** | **31,111** | **2,306** | **2,974** | **9,178** | **6,816** |
| **Unincorporated Sutter County*** | | | | | | | | | | |
| Established Communities | 4,265 | 6,898 | 4,280 | 7,284 | 4,386 | 7,580 | 15 | 386 | 121 | 682 |
| Developing Communities | 810 | 14 | 810 | 14 | 3,287 | 3,489 | 0 | 0 | 2,477 | 3,475 |
| **Unincorporated Sutter County Total** | **5,075** | **6,912** | **5,090** | **7,298** | **7,673** | **11,069** | **15** | **386** | **2,598** | **4,157** |
| **SUTTER COUNTY TOTAL** | **31,751** | **33,708** | **34,304** | **37,583** | **44,375** | **45,986** | **2,553** | **3,875** | **12,624** | **12,278** |

*In 2008, unincorporated Sutter County has an additional 924 jobs and 1,744 housing units today that are in the portion of the existing Yuba City SOI areathat is assumed to be annexed within the planning period. For this reason, the existing jobs and homes are being shown in the Yuba City total.

**2020 and 2035 MTP/SCS Land Use Forecast by Community Type and Jurisdicition**

| | Existing Conditions 2008 | | MTP/SCS 2020 Total | | MTP/SCS 2035 Total | | MTP/SCS 2020 Growth | | MTP/SCS 2035 Growth | |
|---|---|---|---|---|---|---|---|---|---|---|
| Jurisdiction/Community Type | Total Employees | Total Housing Units | Total Employees | Total Housing Units | Total Employees | Total Housing Units | Employee Growth | Housing Unit Growth | Employee Growth | Housing Unit Growth |
| YOLO COUNTY | | | | | | | | | | |
| **Davis** | | | | | | | | | | |
| Corridor/Center Communities | 6,039 | 1,392 | 6,134 | 1,525 | 6,803 | 2,715 | 95 | 133 | 764 | 1,323 |
| Established Communities | 10,218 | 24,227 | 11,074 | 25,421 | 13,637 | 26,550 | 856 | 1,194 | 3,419 | 2,323 |
| **Davis Total** | **16,257** | **25,619** | **17,208** | **26,946** | **20,440** | **29,265** | **951** | **1,327** | **4,183** | **3,646** |
| **West Sacramento** | | | | | | | | | | |
| Corridor/Center Communities | 3,875 | 1,483 | 7,078 | 5,086 | 17,680 | 12,562 | 3,203 | 3,603 | 13,805 | 11,079 |
| Established Communities | 27,848 | 14,806 | 28,688 | 16,001 | 31,418 | 18,633 | 840 | 1,195 | 3,570 | 3,827 |
| Developing Communities | 1,035 | 1,532 | 2,309 | 3,581 | 4,499 | 4,416 | 1,274 | 2,049 | 3,464 | 2,884 |
| **West Sacramento Total** | **32,758** | **17,821** | **38,075** | **24,668** | **53,597** | **35,611** | **5,317** | **6,847** | **20,839** | **17,790** |
| **Winters** | | | | | | | | | | |
| Corridor/Center Communities | 158 | 3 | 158 | 3 | 176 | 3 | 0 | 0 | 18 | 0 |
| Established Communities | 1,832 | 2,046 | 2,081 | 2,412 | 2,940 | 3,063 | 249 | 366 | 1,108 | 1,017 |
| **Winters Total** | **1,990** | **2,049** | **2,239** | **2,415** | **3,116** | **3,066** | **249** | **366** | **1,126** | **1,017** |
| **Woodland** | | | | | | | | | | |
| Corridor/Center Communities | 3,443 | 781 | 3,453 | 781 | 3,470 | 1,522 | 10 | 0 | 27 | 741 |
| Established Communities | 22,400 | 17,964 | 24,589 | 18,048 | 28,371 | 18,946 | 2,189 | 84 | 5,971 | 982 |
| Developing Communities | 400 | 541 | 1,357 | 2,736 | 1,527 | 4,049 | 957 | 2,195 | 1,127 | 3,508 |
| **Woodland Total** | **26,243** | **19,286** | **29,399** | **21,565** | **33,368** | **24,517** | **3,156** | **2,279** | **7,125** | **5,231** |
| **Unincorporated Yolo County** | | | | | | | | | | |
| Corridor/Center Communities | 17,763 | 895 | 18,673 | 2,646 | 20,702 | 2,646 | 910 | 1,751 | 2,939 | 1,751 |
| Established Communities | 7,368 | 6,502 | 7,789 | 6,917 | 9,797 | 7,641 | 421 | 415 | 2,429 | 1,139 |
| **Unincoporated Yolo County Total** | **25,131** | **7,397** | **26,462** | **9,563** | **30,499** | **10,287** | **1,331** | **2,166** | **5,368** | **2,890** |
| YOLO COUNTY TOTAL | 102,379 | 72,172 | 113,383 | 85,157 | 141,020 | 102,746 | 11,004 | 12,985 | 38,641 | 30,574 |
| YUBA COUNTY | | | | | | | | | | |
| **Marysville** | | | | | | | | | | |
| Corridor/Center Communities | 2,531 | 280 | 2,606 | 323 | 2,913 | 386 | 75 | 43 | 382 | 106 |
| Established Communities | 5,753 | 4,983 | 5,915 | 5,025 | 6,387 | 5,334 | 162 | 42 | 634 | 351 |
| **Marysville Total** | **8,284** | **5,263** | **8,521** | **5,348** | **9,300** | **5,720** | **237** | **85** | **1,016** | **457** |
| **Wheatland** | | | | | | | | | | |
| Corridor/Center Communities | 55 | 105 | 55 | 109 | 55 | 109 | 0 | 4 | 0 | 4 |
| Established Communities | 682 | 1,185 | 791 | 1,319 | 901 | 1,319 | 109 | 134 | 219 | 134 |
| Developing Communities | 0 | 21 | 0 | 403 | 708 | 1,048 | 0 | 382 | 708 | 1,027 |
| **Wheatland Total** | **737** | **1,311** | **846** | **1,831** | **1,664** | **2,476** | **109** | **520** | **927** | **1,165** |
| **Unincorporated Yuba County** | | | | | | | | | | |
| Corridor/Center Communities | 1,131 | 367 | 1,193 | 448 | 1,483 | 503 | 62 | 81 | 352 | 136 |
| Established Communities | 3,275 | 7,891 | 3,373 | 8,923 | 4,560 | 9,854 | 98 | 1,032 | 1,285 | 1,963 |
| Beale AFB | 4,652 | 185 | 5,673 | 185 | 6,444 | 185 | 1,021 | 0 | 1,792 | 0 |
| Developing Communities | 643 | 4,795 | 1,569 | 8,996 | 7,416 | 12,509 | 926 | 4,201 | 6,773 | 7,714 |
| Rural Residential Communities | 4,501 | 6,320 | 4,562 | 6,364 | 5,036 | 6,421 | 61 | 44 | 535 | 101 |
| **Unincorporated Yuba County Total** | **14,202** | **19,558** | **16,370** | **24,916** | **24,939** | **29,472** | **2,168** | **5,358** | **10,737** | **9,914** |
| YUBA COUNTY TOTAL | 23,223 | 26,132 | 25,737 | 32,095 | 35,903 | 37,668 | 2,514 | 5,963 | 12,680 | 11,536 |
| Regional Totals | | | | | | | | | | |
| Corridor/Center Communities | 355,829 | 103,209 | 381,911 | 130,887 | 460,014 | 195,255 | 26,082 | 27,678 | 104,185 | 92,046 |
| Established Communities | 564,746 | 684,129 | 623,267 | 722,298 | 752,292 | 763,493 | 58,521 | 38,169 | 187,546 | 79,364 |
| Developing Communities | 16,514 | 25,717 | 33,935 | 76,752 | 81,837 | 152,027 | 17,421 | 51,035 | 65,323 | 126,310 |
| Rural Residential Communities | 29,226 | 71,670 | 29,725 | 73,788 | 33,280 | 76,971 | 499 | 2,118 | 4,054 | 5,301 |
| **Regional Total** | **966,315** | **884,725** | **1,068,838** | **1,003,725** | **1,327,423** | **1,187,746** | **102,523** | **119,000** | **361,108** | **303,021** |

# APPENDIX J

# City of Folsom Russell Ranch Project
# Folsom Plan Area Specific Plan Mitigation Analysis

## December 2014

The Folsom South of U.S. Highway 50 Specific Plan Project EIR/EIS provided a Mitigation Monitoring and Reporting Program, as required by the California Environmental Quality Act (CEQA), in order to monitor the mitigation measures required to avoid significant environmental impacts with the implementation of the Folsom Plan Area Specific Plan (FPASP). The monitoring program ensures that mitigation measures imposed by the City are completed at the appropriate time in the development process.

The Russell Ranch Project (proposed project) is located within the eastern Hillside District of the FPASP and is subject to the FPASP and associated EIR/EIS. The mitigation measures identified in the EIR/EIS for the FPASP are listed below along with the determination of applicability to the development of the proposed project.

## FPASP MITIGATION ANALYSIS
## Russell Ranch Project

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
|---|---|---|---|
| **3A.1-Aesthetics - Land** | | | |
| **3A.1-1: Construct and Maintain a Landscape Corridor Adjacent to U.S. 50.** The project applicant(s) for any particular discretionary development application adjacent to U.S. 50 shall fund, construct, and maintain a landscaped corridor within the SPA, south of U.S. 50. This corridor shall be 50 feet wide, except that the landscaped corridor width shall be reduced to 25 feet adjacent to the proposed regional mall. Landscaping plans and specifications shall be approved by Caltrans and the City of Folsom, and constructed by the project applicant(s) before the start of earthmoving activities associated with residential or commercial units. Landscaped areas would not be required within the preserved oak woodlands. As practicable, landscaping shall primarily contain native and/or drought tolerant plants.<br><br>Landscaped corridors shall be maintained in perpetuity to the satisfaction of the City of Folsom. | | | **Yes – Included on Project's Vesting Tentative Map.** |
| **3A.1-4: Screen Construction Staging Areas.** The project applicant(s) for any particular discretionary development application shall locate staging and material storage areas as far away from sensitive biological resources and sensitive land uses (e.g., residential areas, schools, parks) as feasible. Staging and material storage areas shall be approved by the appropriate agency (identified below) before the approval of grading plans for all project phases and shall be screened from adjacent occupied land uses in earlier development phases to the maximum extent practicable. Screens may include, but are not limited to, the use of such visual barriers such as berms or fences. The screen design shall be approved by the appropriate agency to further reduce visual effects to the extent possible.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries shall be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, and Caltrans) to reduce to the extent feasible the visual effects of construction activities on adjacent project land uses that have already been developed. | | **Yes – See Aesthetics Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.1-5: Establish and Require Conformance to Lighting Standards and Prepare and Implement a Lighting Plan.** To reduce impacts associated with light and glare, the City shall:<br>• Establish standards for on-site outdoor lighting to reduce high-intensity nighttime lighting and glare as part of the Folsom Specific Plan design guidelines/standards. Consideration shall be given to design features, namely directional shielding for street lighting, parking lot lighting, and other substantial light sources, that would reduce effects of nighttime lighting. In addition, consideration shall be given to the use of automatic shutoffs or motion sensors for lighting features to further reduce excess nighttime light.<br>• Use shielded or screened public lighting fixtures to prevent the light from shining off of the surface intended to be illuminated.<br><br>To reduce impacts associated with light and glare, the project applicant(s) of all project phases shall:<br><br>• Shield or screen lighting fixtures to direct the light downward and prevent light spill on adjacent properties.<br>• Flood and area lighting needed for construction activities, nighttime sporting activities, and/or security shall be screened or aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side) when the source is visible from any off-site residential property or public roadway.<br>• For public lighting in residential neighborhoods, prohibit the use of light fixtures that are of unusually high intensity or brightness (e.g., harsh mercury vapor, low-pressure sodium, or fluorescent bulbs) or that blink or flash.<br>• Use appropriate building materials (such as low-glare glass, low-glare building glaze or finish, neutral, earth-toned colored paint and roofing materials), shielded or screened lighting, and appropriate signage in the office/commercial areas to prevent light and glare from adversely affecting motorists on nearby roadways.<br>• Design exterior on-site lighting as an integral part of the building and landscape design in the Folsom Specific Plan area. Lighting fixtures shall be | | **Yes – See Aesthetics Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| architecturally consistent with the overall site design.<br>• Lighting of off-site facilities within the City of Folsom shall be consistent with the City's General Plan standards.<br>• Lighting of the off-site detention basin shall be consistent with Sacramento County General Plan standards.<br>• Lighting of the two local roadway connections from Folsom Heights off-site into El Dorado Hills shall be consistent with El Dorado County General Plan standards.<br><br>A lighting plan for all on- and off-site elements within the each agency's jurisdictional boundaries (specified below) shall be submitted to the relevant jurisdictional agency for review and approval, which shall include the above elements. The lighting plan may be submitted concurrently with other improvement plans, and shall be submitted before the installation of any lighting or the approval of building permits for each phase. The project applicant(s) for any particular discretionary development application shall implement the approved lighting plan.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties). | | | |
| **3A.2-Air Quality - Land** | | | |
| **3A.2-1a: Implement Measures to Control Air Pollutant Emissions Generated by Construction of On-Site Elements.** To reduce short-term construction emissions, the project applicant(s) for any particular discretionary development application shall require their contractors to implement SMAQMD's list of Basic Construction Emission Control Practices, Enhanced Fugitive PM Dust Control Practices, and Enhanced Exhaust Control Practices (list below) in effect at the time individual portions of the site undergo construction. In addition to SMAQMD-recommended measures, construction operations shall comply with all applicable SMAQMD rules and regulations.<br><br>**Basic Construction Emission Control Practices** | | **Yes – See Air Quality and Climate Change Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| • Water all exposed surfaces two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.<br>• Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.<br>• Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.<br>• Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).<br>• All roadways, driveways, sidewalks, parking lots to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.<br>• Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes (as required by the state airborne toxics control measure [Title 13, Section 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.<br>• Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determine to be running in proper condition before it is operated.<br><br>**Enhanced Fugitive PM Dust Control Practices – Soil Disturbance Areas**<br><br>• Water exposed soil with adequate frequency for continued moist soil. However, do not overwater to the extent that sediment flows off the site.<br>• Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 mph.<br>• Plant vegetative ground cover (fast-germinating native grass seed) in disturbed areas as soon as possible. Water appropriately until vegetation is established. | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **Enhanced Fugitive PM Dust Control Practices – Unpaved Roads**<br><br>• Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.<br>• Treat site accesses to a distance of 100 feet from the paved road with a 6 to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto public roads.<br>• Post a publicly visible sign with the telephone number and person to contact at the construction site regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of SMAQMD and the City contact person shall also be posted to ensure compliance.<br><br>**Enhanced Exhaust Control Practices**<br><br>• The project shall provide a plan, for approval by the City of Folsom Community Development Department and SMAQMD, demonstrating that the heavy-duty (50 horsepower [hp] or more) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project wide fleet-average 20% $NO_X$ reduction and 45% particulate reduction compared to the most current California Air Resources Board (ARB) fleet average that exists at the time of construction. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. The project applicant(s) of each project phase or its representative shall submit to the City of Folsom Community Development Department and SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 hp, that would be used an aggregate of 40 or more hours during any portion of the construction project. The inventory shall include the horsepower rating, engine production year, and projected hours of use for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of heavy-duty off-road equipment, the project representative shall provide SMAQMD with | | | |

# FPASP MITIGATION ANALYSIS
## Russell Ranch Project

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
|---|---|---|---|
| the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman. SMAQMD's Construction Mitigation Calculator can be used to identify an equipment fleet that achieves this reduction (SMAQMD 2007a). The project shall ensure that emissions from all off-road diesel powered equipment used on the SPA do not exceed 40% opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately, and the City and SMAQMD shall be notified within 48 hours of identification of non- compliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the project, except that the monthly summary shall not be required for any 30- day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. SMAQMD staff and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this mitigation measure shall supersede other SMAQMD or state rules or regulations.<br>• If at the time of construction, SMAQMD has adopted a regulation or new guidance applicable to construction emissions, compliance with the regulation or new guidance may completely or partially replace this mitigation if it is equal to or more effective than the mitigation contained herein, and if SMAQMD so permits. | | | |
| **3A.2-1b: Pay Off-site Mitigation Fee to SMAQMD to Off-Set $NO_x$ Emissions Generated by Construction of On- Site Elements.** Implementation of the Proposed Project or the other four other action alternatives would result in construction-generated $NO_X$ emissions that exceed the SMAQMD threshold of significance, even after implementation of the SMAQMD Enhanced Exhaust Control Practices (listed in Mitigation Measure 3A.2-1a). Additionally, Mitigation Measure 3A.4-1 (Implement Additional Measures to Control Construction-Generated GHG Emissions, pages 3A.4-14 to 15) has the potential to both reduce and increase $NO_X$ emissions, depending on the types of alternative fuels and engine types employed.<br><br>Therefore, the project applicant(s) shall pay SMAQMD an off-site mitigation | | **Yes – See Air Quality and Climate Change Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| fee for implementation of any of the five action alternatives for the purpose of reducing $NO_X$ emissions to a less-than-significant level (i.e., less than 85 lb/day). All $NO_X$ emission reductions and increases associated with GHG mitigation shall be added to or subtracted from the amount above the construction threshold to determine off-site mitigation fees, when possible. The specific fee amounts shall be calculated when the daily construction emissions can be more accurately determined: that is, if the City/USACE select and certify the EIR/EIS and approves the Proposed Project or one of the other four other action alternatives, the City and the applicants must establish the phasing by which development would occur, and the applicants must develop a detailed construction schedule. Calculation of fees associated with each project development phase shall be conducted by the project applicant(s) in consultation with SMAQMD staff before the approval of grading plans by the City. The project applicant(s) for any particular discretionary development application shall pay into SMAQMD's off-site construction mitigation fund to further mitigate construction- generated emissions of $NO_X$ that exceed SMAQMD's daily emission threshold of 85 lb/day. The calculation of daily $NO_X$ emissions shall be based on the cost rate established by SMAQMD at the time the calculation and payment are made. At the time of writing this EIR/EIS the cost rate is $16,000 to reduce 1 ton of $NO_X$ plus a 5% administrative fee (SMAQMD 2008c). The determination of the final mitigation fee shall be conducted in coordination with SMAQMD before any ground disturbance occurs for any project phase. Based on information available at the time of writing this EIR/EIS, and assuming that construction would be performed at a consistent rate over a 19-year period (and averaging of 22 work days per month), it is estimated that the off-site construction mitigation fees would range from $517,410 to $824,149, depending on which alternative is selected. Because the fee is based on the mass quantity of emissions that exceed SMAQMD's daily threshold of significance of 85 lb/day, total fees would be substantially greater if construction activity is more intense during some phases and less intense during other phases of the 19-year build out period, and in any event, based on the actual cost rate applied by SMAQMD. (This fee is used by SMAQMD to purchase off-site emissions reductions. Such purchases are made through SMAQMD's Heavy Duty Incentive Program, through which | | | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
|---|---|---|---|
| select owners of heavy-duty equipment in Sacramento County can repower or retrofit their old engines with cleaner engines or technologies.) | | | |
| **3A.2-1c: Analyze and Disclose Projected $PM_{10}$ Emission Concentrations at Nearby Sensitive Receptors Resulting from Construction of On-Site Elements.** Prior to construction of each discretionary development entitlement of on-site land uses, the project applicant shall perform a project-level CEQA analysis (e.g., supporting documentation for an exemption, negative declaration, or project-specific EIR) that includes detailed dispersion modeling of construction-generated $PM_{10}$ to disclose what $PM1_{10}$ concentrations would be at nearby sensitive receptors. The dispersion modeling shall be performed in accordance with applicable SMAQMD guidance that is in place at the time the analysis is performed. At the time of writing this EIR/EIS, SMAQMD's most current and most detailed guidance for addressing construction-generated PM10 emissions is found in its Guide to Air Quality Assessment in Sacramento County (SMAQMD 2009a). The project-level analysis shall incorporate detailed parameters of the construction equipment and activities, including the year during which construction would be performed, as well as the proximity of potentially affected receptors, including receptors proposed by the project that exist at the time the construction activity would occur. | | | **Yes – See Air Quality and Climate Change Chapter.** |
| **3A.2-1d: Implement SMAQMD's Basic Construction Emission Control Practices during Construction of all Off- site Elements located in Sacramento County.** The applicants responsible for the construction of each off-site element in Sacramento County shall require their contractors to implement SMAQMD's Basic Construction Emission Control Practices during construction. A list of SMAQMD's Basic Construction Emission Control Practices is provided under Mitigation Measure 3A.2-1a.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Sacramento County or Caltrans) to implement SMAQMD's Basic Construction Emission Control Practices or comparable feasible measures. | | **Yes – See Air Quality and Climate Change Chapter.** | |

<table>
<tr><th colspan="4">FPASP MITIGATION ANALYSIS<br>Russell Ranch Project</th></tr>
<tr><th>FPASP Mitigation Measure</th><th>Not Applicable to the Project</th><th>Applicable to the Project and Included as Mitigation</th><th>Project has Completed</th></tr>
<tr><td>3A.2-1e: Implement EDCAQMD-Recommended Measures for Controlling Fugitive $PM_{10}$ dust During Construction of the Two Roadway Connections in El Dorado County. Prior to construction of each roadway extension in El Dorado County, the applicants or its contractors shall develop a fugitive dust control plan that is approved by EDCAQMD and the applicants shall require their contractors to implement the dust control measures identified in the EDCAQMD-approved fugitive dust control plan. The fugitive dust control plan shall contain measures that are recommended by EDCAQMD at the time the plan is developed, which may include, but is not limited to, the current list of EDCAQMD-recommended dust control measures provided in Table 3A.2-5 below.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., El Dorado County).<br><br>
<table>
<tr><th colspan="2">Table 3A.2-5<br>EDCAQMD-Recommend Fugitive Dust Control Measures</th></tr>
<tr><th>Source</th><th>Mitigation Measure</th></tr>
<tr><td rowspan="2">Soil Piles</td><td>Enclose, cover, or water twice daily all soil piles</td></tr>
<tr><td>Automatic sprinkler system installed on soil piles</td></tr>
<tr><td rowspan="2">Exposed Surface Grading</td><td>Water all exposed soil twice daily</td></tr>
<tr><td>Water exposed soil with adequate frequency to keep soil moist at all times</td></tr>
<tr><td rowspan="2">Truck Hauling Road</td><td>Water all haul roads twice daily</td></tr>
<tr><td>Pave all haul roads</td></tr>
<tr><td rowspan="2">Truck Hauling Load</td><td>Maintain at least two feet of freeboard</td></tr>
<tr><td>Cover load of all haul/dump trucks securely</td></tr>
<tr><td colspan="2">Source: Table 4.12 of EDCAQMD's Guide to Air Quality Assessment (EDCAQMD 2002).</td></tr>
</table>
</td><td>N/A – The Russell Ranch Project does not include the Two Roadway Connections in El Dorado County.</td><td></td><td></td></tr>
<tr><td>3A.2-1f: Implement SMAQMD's Enhanced Exhaust Control Practices during Construction of all Off-site Elements. Implement SMAQMD's Enhanced Exhaust Control Practices, which are listed in Mitigation Measure 3A.2-1a, in order to control $NO_X$ emissions generated by construction of all off-site elements (in Sacramento and El Dorado Counties, or Caltrans right-of-way).</td><td></td><td>Yes – See Air Quality and Climate Change Chapter.</td><td></td></tr>
</table>

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.2-1g: Pay Off-site Mitigation Fee to SMAQMD to Off-Set $NO_X$ Emissions Generated by Construction of Off- site Elements.** The off-site elements could result in construction-generated $NO_X$ emissions that exceed the SMAQMD threshold of significance, even after implementation of the SMAQMD Enhanced Exhaust Control Practices (listed in Mitigation Measure 3A.2-1a).<br><br>Therefore, the responsible project applicant(s) for each off-site element in Sacramento County shall pay SMAQMD an off-site mitigation fee for implementation of each off-site element in Sacramento County for the purpose of reducing $NO_X$ emissions to a less-than-significant level (i.e., less than 85 lb/day). The specific fee amounts shall be calculated when the daily construction emissions can be more accurately determined. This calculation shall occur if the City/USACE certify the EIR/EIS and select and approves the Proposed Project or one of the other four other action alternatives, the City, Sacramento County, and the applicants establish the phasing by which construction of the off- site elements would occur, and the applicants develop a detailed construction schedule. Calculation of fees associated with each off-site element shall be conducted by the project applicant(s) in consultation with SMAQMD staff before 'the approval of respective grading plans by Sacramento County. The project applicant(s) responsible for each off-site element in Sacramento County shall pay into SMAQMD's off- site construction mitigation fund to further mitigate construction-generated emissions of $NO_X$ that exceed SMAQMD's daily emission threshold of 85 lb/day. The calculation of daily $NO_X$ emissions shall be based on the cost rate established by SMAQMD at the time the calculation and payment are made. At the time of writing this EIR/EIS the cost rate is $16,000 to reduce 1 ton of $NO_X$ plus a 5% administrative fee (SMAQMD 2008c). The determination of the final mitigation fee shall be conducted in coordination with SMAQMD before any ground disturbance occurs for any project phase. Because the fee is based on the mass quantity of emissions that exceed SMAQMD's daily threshold of significance of 85 lb/day, total fees for construction of the off-site elements would vary according to the timing and potential overlap of construction schedules for off-site elements. This measure applies only to those off-site elements located in SMAQMD's jurisdiction (i.e., in Sacramento County) because EDCAQMD does not offer a similar off-set fee program for construction- | | **Yes – See Air Quality and Climate Change Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| generated $NO_X$ emissions in its jurisdiction. (This fee is used by SMAQMD to purchase off-site emissions reductions. Such purchases are made through SMAQMD's Heavy Duty Incentive Program, through which select owners of heavy-duty equipment in Sacramento County can repower or retrofit their old engines with cleaner engines or technologies.)<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., Sacramento County or Caltrans). | | | |
| **3A.2-1h: Analyze and Disclose Projected $PM_{10}$ Emission Concentrations at Nearby Sensitive Receptors Resulting from Construction of Off-site Elements.** Prior to construction of each off-site element located in Sacramento County that would involve site grading or earth disturbance activity that would exceed 15 acres in one day, the responsible agency or its selected consultant shall conduct detailed dispersion modeling of construction-generated $PM_{10}$ emissions pursuant to SMAQMD guidance that is in place at the time the analysis is performed. At the time of writing this EIR/EIS, SMAQMD's most current and most detailed guidance for addressing construction-generated $PM_{10}$ emissions is found in its Guide to Air Quality Assessment in Sacramento County SMAQMD 2009a).<br><br>SMAQMD emphasizes that $PM_{10}$ emission concentrations at nearby sensitive receptors be disclosed in project-level CEQA analysis. Each project-level analysis shall incorporate detailed parameters of the construction equipment and activities, including the year during which construction would be performed, as well as the proximity of potentially affected receptors, including receptors proposed by the project that exist at the time the construction activity would occur. If the modeling analysis determines that construction activity would result in an exceedance or substantial contribution to the CAAQS and NAAQS at a nearby receptor, then the project applicant(s) shall require their respective contractors to implement additional measures for controlling construction-generated $PM_{10}$ exhaust emission and fugitive $PM_{10}$ dust emissions in accordance with SMAQMD guidance, requirements, and/or rules that apply at the | | **Yes – See Air Quality and Climate Change Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
|---|---|---|---|
| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| time the project-level analysis is performed. It is likely that these measures would be the same or similar to those listed as Enhanced Fugitive PM Dust Control Practices for Soil Disturbance Areas and Unpaved Roads and Enhanced Exhaust Control Practices included in Mitigation Measure 3A.2-1a. Dispersion modeling is not required for the two El Dorado County roadway connections because the total amount of disturbed acreage is expected to be less than the EDCAQMD screening level of 12 acres.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., Sacramento County or Caltrans). | | | |
| **3A.2-2: Implement All Measures Prescribed by the Air Quality Mitigation Plan to Reduce Operational Air Pollutant Emissions.** To reduce operational emissions, the project applicant(s) for any particular discretionary development application shall implement all measures prescribed in the SMAQMD-approved *Folsom Plan Area Specific Plan Air Quality Mitigation Plan* (AQMP) (Torrence Planning 2008), a copy of which is included in Appendix C2. The AQMP is intended to improve mobility, reduce vehicle miles traveled, and improve air quality as required by AB 32 and SB 375. The AQMP includes, among others, measures designed to provide bicycle parking at commercial land uses, an integrated pedestrian/bicycle path network, transit stops with shelters, a prohibition against the use the wood-burning fireplaces, energy star roofing materials, electric lawnmowers provided to homeowners at no charge, and on-site transportation alternatives to passenger vehicles (including light rail) that provide connectivity with other local and regional alternative transportation networks. | | **Yes – See Air Quality and Climate Change Chapter.** | |
| **3A.2-4a: Develop and Implement a Plan to Reduce Exposure of Sensitive Receptors to Construction-Generated Toxic Air Contaminant Emissions.** The project applicant(s) for any particular discretionary development application shall develop a plan to reduce the exposure of sensitive receptors to TACs generated by project construction activity associated with buildout of the selected alternative. Each plan shall be developed by the project applicant(s) in consultation with SMAQMD. The plan shall be submitted to the City for review and approval before the approval of any grading plans. | **N/A – Project Specific Analysis Determined the Plan is not needed. See Air Quality and Climate Change Chapter.** | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| The plan may include such measures as scheduling activities when the residences are the least likely to be occupied, requiring equipment to be shut off when not in use, and prohibiting heavy trucks from idling. Applicable measures shall be included in all project plans and specifications for all project phases.<br><br>The implementation and enforcement of all measures identified in each plan shall be funded by the project applicant(s) for the respective phase of development. | | | |
| **3A.2-4b: Implement Measures to Reduce Exposure of Sensitive Receptors to Operational Emissions of Toxic Air Contaminants.** The following measures shall be implemented to reduce exposure of sensitive receptors to Toxic Air Contaminants.<br><br>• Proposed commercial and industrial land uses that have the potential to emit TACs or host TAC-generating activity (e.g., loading docks) shall be located away from existing and proposed on-site sensitive receptors such that they do not expose sensitive receptors to TAC emissions that exceed an incremental increase of 10 in 1 million for the cancer risk and/or a noncarcinogenic Hazard Index of 1.0.<br>• The multi-family residences planned across from the off-site corporation yard near the southwest corner of the SPA shall be set back as far as possible from the boundary of the corporation yard and/or relocated to another area.<br>• Where necessary to reduce exposure of sensitive receptors to an incremental increase of 10 in 1 million for the cancer risk and/or a noncarcinogenic Hazard Index of 1.0, proposed commercial and industrial land uses that would host diesel trucks shall incorporate idle reduction strategies that reduce the main propulsion engine idling time through alternative technologies such as, IdleAire, electrification of truck parking, and alternative energy sources for TRUs, to allow diesel engines to be completely turned off.<br>• Signs shall be posted in at all loading docks and truck loading areas which indicate that diesel-powered delivery trucks must be shut off when not in use for longer than 5 minutes on the premises in order to reduce idling emissions. This measure is consistent with the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which was approved by the California Office of Administrative Law in January 2005. | **N/A – Project Specific Analysis Determined the Plan is not needed. See Air Quality and Climate Change Chapter.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| • Implement the following additional guidelines, which are recommended in ARB's *Land Use Handbook: A Community Health Perspective* (ARB 2005) and are considered to be advisory and not regulatory:<br>i. Sensitive receptors, such as residential units and daycare centers, shall not be located in the same building as dry-cleaning operations that use perchloroethylene. Dry-cleaning operations that use perchloroethylene shall not be located within 300 feet of any sensitive receptor. A setback of 500 feet shall be provided for operations with two or more machines.<br>ii. Large gasoline stations (defined as facilities with a throughput of 3.6 million gallons per year or greater) and sensitive land uses shall not be sited within 300 feet of each other. Small gasoline-dispensing facilities (less than 3.6 million gallons of throughput per year) and sensitive land uses shall not be sited within 50 feet of each other. | | | |
| **3A.2-5: Implement A Site Investigation to Determine the Presence of NOA and, if necessary, Prepare and Implement an Asbestos Dust Control Plan.** A site investigation shall be performed to determine whether and where NOA is present in the soil and rock on the SPA. The site investigation shall include the collection of soil and rock samples by a qualified geologist. If the site investigation determines that NOA is present on the SPA then the project applicant shall prepare an Asbestos Dust Control Plan for approval by SMAQMD as required in Title 17, Section 93105 of the California Code of Regulations, "Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations." The Asbestos Dust Control Plan shall specify measures, such as periodic watering to reduce airborne dust and ceasing construction during high winds. Measures in the Asbestos Dust Control Plan may include but shall not be limited to dust control measures required by Mitigation Measure 3A.2-1a. The project applicant shall submit the plan to the Folsom Community Development Department for review and SMAQMD for review and approval before construction of the first project phase. SMAQMD approval of the plan must be received before any asbestos-containing rock (serpentinite) can be disturbed. Upon approval of the Asbestos Dust Control Plan by SMAQMD, the applicant shall ensure that construction contractors implement the terms of the plan throughout the construction period. | | **Yes – See Air Quality and Climate Change Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.2-6: Implement Measures to Control Exposure of Sensitive Receptors to Operational Odorous Emissions.** The project applicant(s) for any particular discretionary development application shall implement the following measures:<br><br>• The odor-producing potential of land uses shall be considered when the exact type of facility that would occupy areas zoned for commercial, industrial, or mixed-use land uses is determined. Facilities that have the potential to emit objectionable odors shall be located as far away as feasible from existing and proposed sensitive receptors.<br>• The multi-family residences planned across from the off-site corporation yard near the southwest corner of the SPA shall be set back as far as possible from the boundary of the corporation yard and/or relocated to another area. (This measure is also required by Mitigation Measure 3A.2-4b to limit exposure to TAC emissions.)<br>• Before the approval of building permits, odor control devices shall be identified to mitigate the exposure of receptors to objectionable odors if a potential odor-producing source is to occupy an area zoned for commercial, industrial, or mixed-use land uses. The identified odor control devices shall be installed before the issuance of certificates of occupancy for the potentially odor-producing use. The odor- producing potential of a source and control devices shall be determined in coordination with SMAQMD and based on the number of complaints associated with existing sources of the same nature.<br>• The deeds to all properties located within the plan area that are within one mile of an on- or off-site area zoned or used for agricultural use (including livestock grazing) shall be accompanied by a written disclosure from the transferor, in a form approved by the City of Folsom, advising any transferee of the potential adverse odor impacts from surrounding agricultural operations, which disclosure shall direct the transferee to contact the County of Sacramento concerning any such property within the County zoned for agricultural uses within one mile of the subject property being transferred.<br>• Truck loading docks and delivery areas shall be located as far away as feasible from existing and proposed sensitive receptors.<br>• Signs shall be posted at all loading docks and truck loading areas which indicate that diesel-powered delivery trucks must be shut off when not in use | **N/A – Project Specific Analysis Concluded *Less than Significant.*** | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| for longer than 5 minutes on the premises in order to reduce idling emissions. This measure is consistent with the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which was approved by California's Office of Administrative Law in January 2005. (This measure is also required by Mitigation Measure 3A.2-4b to limit TAC emissions.)<br>• Proposed commercial and industrial land uses that have the potential to host diesel trucks shall incorporate idle reduction strategies that reduce the main propulsion engine idling time through alternative technologies such as, IdleAire, electrification of truck parking, and alternative energy sources for TRUs, to allow diesel engines to be completely turned off. (This measure is also required by Mitigation Measure 3A.2-4b to limit TAC emissions.) | | | |
| **3A.3 Biological Resources - Land** | | | |
| **3A.3-1a: Design Stormwater Drainage Plans and Erosion and Sediment Control Plans to Avoid and Minimize Erosion and Runoff to All Wetlands and Other Waters That Are to Remain on the SPA and Use Low Impact Development Features.** To minimize indirect effects on water quality and wetland hydrology, the project applicant(s) for any particular discretionary development application shall include stormwater drainage plans and erosion and sediment control plans in their improvement plans and shall submit these plans to the City Public Works Department for review and approval. For off-site elements within Sacramento County or El Dorado County jurisdiction (e.g., off-site detention basin and off-site roadway connections to El Dorado Hills), plans shall be submitted to the appropriate county planning department. Before approval of these improvement plans, the project applicant(s) for any particular discretionary development application shall obtain a NPDES MS4 Municipal Stormwater Permit and Grading Permit, comply with the City's Grading Ordinance and County drainage and stormwater quality standards, and commit to implementing all measures in their drainage plans and erosion and sediment control plans to avoid and minimize erosion and runoff into Alder Creek and all wetlands and other waters that would remain on-site. Detailed information about stormwater runoff standards and relevant City and County regulation is provided in Chapter 3A.9, "Hydrology and Water Quality."<br><br>The project applicant(s) for any particular discretionary development entitlement | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |

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| shall implement stormwater quality treatment controls consistent with the Stormwater Quality Design Manual for Sacramento and South Placer Regions in effect at the time the application is submitted. Appropriate runoff controls such as berms, storm gates, off-stream detention basins, overflow collection areas, filtration systems, and sediment traps shall be implemented to control siltation and the potential discharge of pollutants. Development plans shall incorporate Low Impact Development (LID) features, such as pervious strips, permeable pavements, bioretention ponds, vegetated swales, disconnected rain gutter downspouts, and rain gardens, where appropriate. Use of LID features is recommended by the EPA to minimize impacts on water quality, hydrology, and stream geomorphology and is specified as a method for protecting water quality in the proposed specific plan. In addition, free spanning bridge systems shall be used for all roadway crossings over wetlands and other waters that are retained in the on-site open space. These bridge systems would maintain the natural and restored channels of creeks, including the associated wetlands, and would be designed with sufficient span width and depth to provide for wildlife movement along the creek corridors even during high-flow or flood events, as specified in the 404 permit.<br><br>In addition to compliance with City ordinances, the project applicant(s) for any particular discretionary development application shall prepare a Stormwater Pollution Prevention Plan (SWPPP), and implement Best Management Practices (BMPs) that comply with the General Construction Stormwater Permit from the Central Valley RWQCB, to reduce water quality effects during construction. Detailed information about the SWPPP and BMPs are provided in Chapter 3A.9, "Hydrology and Water Quality."<br><br>Each project development shall result in no net change to peak flows into Alder Creek and associated tributaries, or to Buffalo Creek, Carson Creek, and Coyote Creek. The project applicant(s) shall establish a baseline of conditions for drainage on-site. The baseline-flow conditions shall be established for 2-, 5-, and 100-year storm events. These baseline conditions shall be used to develop monitoring standards for the stormwater system on the SPA. The baseline conditions, monitoring standards, and a monitoring program shall be submitted to USACE and the City for their approval. Water quality and detention basins shall be | | | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| designed and constructed to ensure that the performance standards, which are described in Chapter 3A.9, "Hydrology and Water Quality," are met and shall be designed as off-stream detention basins.<br><br>Discharge sites into Alder Creek and associated tributaries, as well as tributaries to Carson Creek, Coyote Creek, and Buffalo Creek, shall be monitored to ensure that preproject conditions are being met. Corrective measures shall be implemented as necessary. The mitigation measures will be satisfied when the monitoring standards are met for 5 consecutive years without undertaking corrective measures to meet the performance standard.<br><br>See FEIR/FEIS Appendix S showing that the detention basin in the northeast corner of the SPA has been moved off stream.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., El Dorado County for the roadway connections, Sacramento County for the detention basin west of Prairie City Road, and Caltrans for the U.S. 50 interchange improvements) such that the performance standards described in Chapter 3A.9, "Hydrology and Water Quality," are met. | | | |
| **3A.3-1b: Secure Clean Water Act Section 404 Permit and Implement All Permit Conditions; Ensure No Net Loss of Functions and Values of Wetlands, Other Waters of the U.S., and Waters of the State.** Before the approval of grading and improvement plans and before any groundbreaking activity associated with each distinct discretionary development entitlement, the project applicant(s) for any particular discretionary development application requiring fill of wetlands or other waters of the U.S. or waters of the state shall obtain all necessary permits under Sections 401 and 404 of the CWA or the state's Porter-Cologne Act for the respective phase. For each respective discretionary development entitlement, all permits, regulatory approvals, and permit conditions for effects on wetland habitats shall be secured before implementation of any grading activities within 250 feet of waters of the U.S. or wetland habitats or lesser distance deemed sufficiently protective by a qualified biologist with approval from USFWS, including waters of the state, that potentially support | | **Yes – See Biological Resources Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Federally listed species. The project applicant(s) shall commit to replace, restore, or enhance on a "no net loss" basis (in accordance with USACE and the Central Valley RWQCB) the acreage of all wetlands and other waters of the U.S. that would be removed, lost, and/or degraded with implementation of project plans for that development increment. Wetland habitat shall be restored, enhanced, and/or replaced at an acreage and location and by methods agreeable to USACE, the Central Valley RWQCB, and the City, as appropriate, depending on agency jurisdiction, and as determined during the Section 401 and Section 404 permitting processes.<br><br>As part of the Section 404 permitting process, a draft wetland mitigation and monitoring plan (MMP) shall be developed for the project on behalf of the project applicant(s). Before any ground-disturbing activities in an area that would adversely affect wetlands and before engaging in mitigation activities associated with each discretionary development entitlement, the project applicant(s) shall submit the draft wetland MMP to USACE, the Central Valley RWQCB, Sacramento County, El Dorado County, and the City for review and approval of those portions of the plan over which they have jurisdiction. The MMP would have to be finalized prior to impacting any wetlands. Once the final MMP is approved and implemented, mitigation monitoring shall continue for a minimum of 5 years from completion of mitigation, or human intervention (including recontouring and grading), or until the performance standards identified in the approved MMP have been met, whichever is longer.<br><br>As part of the MMP, the project applicant(s) shall prepare and submit plans for the creation of aquatic habitat in order to adequately offset and replace the aquatic functions and services that would be lost at the SPA, account for the temporal loss of habitat, and contain an adequate margin of safety to reflect anticipated success. Restoration of previously altered and degraded wetlands shall be a priority of the MMP for offsetting losses of aquatic functions on the SPA because it is typically easier to achieve functional success in restored wetlands than in those created from uplands. The MMP must demonstrate how the aquatic functions and values that would be lost through project implementation will be replaced.<br><br>The habitat MMP for jurisdictional wetland features shall be consistent with | | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| USACE's and EPA's April 10, 2008 Final Rule for Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332 and 40 CFR Part 230) and USACE's October 26, 2010 *Memorandum Re: Minimum Level of Documentation Required for Permit Decisions*. According to the Final Rule, mitigation banks should be given preference over other types of mitigation because a lot of the risk and uncertainty regarding mitigation success is alleviated by the fact that mitigation bank wetlands must be established and demonstrating functionality before credits can be sold. The use of mitigation credits also alleviates temporal losses of wetland function while compensatory wetlands are being established. Mitigation banks also tend to be on larger, more ecologically valuable parcels and are subjected to more rigorous scientific study and planning and implementation procedures than typical permittee-responsible mitigation sites (USACE and EPA, 2008). Permittee-responsible on-site mitigation areas can be exposed to long-term negative effects of surrounding development since they tend to be smaller and less buffered than mitigation banks. The Final Rule also establishes a preference for a "watershed approach" in selecting locations for compensatory mitigation project locations, that mitigation selection must be "appropriate and practicable" and that mitigation banks must address watershed needs based on criteria set forth in the Final Rule. The watershed approach accomplishes this objective by expanding the informational and analytic basis of mitigation project site selection decisions and ensuring that both authorized impacts and mitigation are considered on a watershed scale rather than only project by project. This requires a degree of flexibility so that district engineers can authorize mitigation projects that most effectively address the case-specific circumstances and needs of the watershed, while remaining practicable for the permittee. The SPA includes portions of the Alder Creek, Buffalo Creek, Coyote Creek, and Carson Creek Watersheds. The majority of the SPA is within the Alder Creek Watershed. Alder Creek and Buffalo Creek are part of the Lower American River Watershed. Carson Creek and Coyote Creek are part of the Cosumnes River Watershed. Mitigation credits may be available within the Cosumnes Watershed, but not within the American River Watershed and not within the sub-watersheds of the SPA. Therefore aquatic habitats may need to be restored or created on the SPA and adjacent off-site lands, preferably within the affected watersheds, in order to successfully replace lost functions at the appropriate watershed scale where loss of function would occur. It is not likely | | | |

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| feasible to provide compensatory mitigation for all aquatic resource impacts on site. Therefore, a combination of on-site and off-site permittee-responsible mitigation and mitigation banking would likely be necessary to achieve the no-net-loss standard.<br><br>The SPA is located within the service areas of several approved mitigation banks (e.g., Bryte Ranch, Clay Station, Fitzgerald Ranch, and Twin City Mitigation Bank). The majority of compensatory mitigation for wetland impacts is proposed to be accomplished at an agency- approved mitigation bank or banks authorized to sell credits to offset impacts in the SPA. The applicants' biological consultant, ECORP, has identified availability of approximately 31 vernal pool credits and 228 seasonal wetland credits at mitigation banks whose service area includes the SPA. Additional credits may also be available from pending, but not yet approved, mitigation banks. However, availability is subject to change and, as noted above, a combination of mitigation bank credits and permittee-responsible on and off-site mitigation may be necessary to fully offset project impacts on wetlands and other waters of the U.S. If USACE determines that the use of mitigation bank credits is not sufficient mitigation to offset impacts within the SPA, the October 26, 2010 Memorandum Re: Minimum Level of Documentation Required for Permit Decisions requires USACE to specifically demonstrate why the use of bank credits is not acceptable to USACE in accordance with Section 33 CFR 332.3(a)(1).<br><br>Compensatory mitigation for losses of stream and intermittent drainage channels shall follow the Final Rule Guidelines , which specify that compensatory mitigation should be achieved through in-kind preservation, restoration, or enhancementwithin the same watershed, subject to practicability considerations. The wetland MMP shall address how to mitigate impacts on vernal pool, seasonal swale, seasonal wetland, seep, marsh, pond, and intermittent and perennial stream habitat, and shall describe specific method(s) to be implemented to avoid and/or mitigate any off-site project-related impacts. The wetland compensation section of the habitat MMP shall include the following:<br><br>• Compensatory mitigation sites and criteria for selecting these mitigation sites. In General, compensatory mitigation sites should meet the following criteria, | | | |

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| based on the Final Rule;<br>i. located within the same watershed as the wetland or other waters that would be lost, as appropriate and practicable;<br>ii. located in the most likely position to successfully replace wetland functions lost on the impact site considering watershed-scale features such as aquatic habitat diversity, habitat connectivity, available water sources and hydrologic relationships, land use trends, ecological benefits, and compatibility with adjacent land uses, and the likelihood for success and sustainability;<br>• A complete assessment of the existing biological resources in both the on-site preservation areas and off-site compensatory mitigation areas, including wetland functional assessment using the California Rapid Assessment Method (CRAM) (Collins et al. 2008), or other appropriate wetland assessment protocol as determined through consultation with USACE and the USFWS, to establish baseline conditions;<br>• Specific creation and restoration plans for each mitigation site;<br>• Use of CRAM to compare compensatory wetlands to the baseline CRAM scores from wetlands in the SPA. The compensatory wetland CRAM scores shall be compared against the highest quality wetland of each type from the SPA;<br>• CRAM scores, or other wetland assessment protocol scores, from the compensatory wetlands shall be compared against the highest quality wetland scores for each wetland type to document success of compensatory wetlands in replacing the functions of the affected wetlands to be replaced;<br>• Monitoring protocol, including schedule and annual report requirements, and the following elements:<br>i. ecological performance standards, based on the best available science, that can be assessed in a practicable manner (e.g., performance standards proposed by Barbour et al. 2007). Performance standards must be based on attributes that are objective and verifiable;<br>ii. assessments conducted annually for 5 years after construction or restoration of compensatory wetlands to determine whether these areas are acquiring wetland functions and to plot the performance | | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| trajectory of preserved, restored, or created wetlands over time. Assessments results for compensatory wetlands shall also be compared against scores for reference wetlands assessed in the same year;<br>iii. assessments analysis conducted annually for 5 years after any construction adjacent to wetlands preserved on the SPA to determine whether these areas are retaining functions and values. Assessments results for wetlands preserved on site shall also be compared against scores for reference wetlands assessed in the same year;<br>iv. analysis of assessments data, including assessment of potential stressors, to determine whether any remedial activities may be necessary;<br>v. corrective measures if performance standards are not met;<br>vi. monitoring of plant communities as performance criteria (annual measure of success, during monitoring period) and success criteria (indicative of achievement of mitigation habitat requirement at end of monitoring period) for hydrologic function have become established and the creation site "matures" over time;<br>vii. GIS analysis of compensatory wetlands to demonstrate actual acreage of functioning wetland habitat;<br>viii. adaptive management measures to be applied if performance standards and acreage requirements are not being met;<br>ix. responsible parties for monitoring and preparing reports; and<br>x. responsible parties for receiving and reviewing reports and for verifying success or prescribing implementation or corrective actions.<br><br>A final operations and management plan (OMP) for all on- and off-site permittee-sponsored wetland preservation and mitigation areas shall be prepared and submitted to USACE and USFWS for review, comment and preliminary approval prior to the issuance of any permits under Section 404 of the CWA. The plan shall include detailed information on the habitats present within the preservation and mitigation areas, the long-term management and monitoring of these habitats, legal protection for the preservation and mitigation areas (e.g., conservation | | | |

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| easement, declaration of restrictions), and funding mechanism information (e.g., endowment). A final OMP for each discretionary development entitlement affecting wetlands must be approved prior to construction.<br><br>USACE has determined that the project will require an individual permit. In its final stage and once approved by USACE, the MMP for the project is expected to detail proposed wetland restoration, enhancement, and/or replacement activities that would ensure no net loss of aquatic functions in the project vicinity. Approval and implementation of the wetland MMP shall aim to fully mitigate all unavoidable impacts on jurisdictional waters of the U.S., including jurisdictional wetlands. In addition to USACE approval, approval by the City, Sacramento County, El Dorado County, and the Central Valley RWQCB, as appropriate depending on agency jurisdiction, and as determined during the Section 401 and Section 404 permitting processes, will also be required. Approvals from Sacramento County and El Dorado County shall be required for impacts resulting from off-site project elements occurring in these counties, such as the off-site detention basin in Sacramento County and the roadway connections into El Dorado County. To satisfy the requirements of the City and the Central Valley RWQCB, mitigation of impacts on the nonjurisdictional wetlands beyond the jurisdiction of USACE shall be included in the same MMP. All mitigation requirements determined through this process shall be implemented before grading plans are approved. The MMP shall be submitted to USACE and approved prior to the issuance of any permits under Section 404 of the CWA.<br><br>Water quality certification pursuant to Section 401 of the CWA will be required before issuance of a Section 404 permit. Before construction in any areas containing wetland features, the project applicant(s) shall obtain water quality certification for the project. Any measures required as part of the issuance of water quality certification shall be implemented.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., Caltrans, El Dorado and/or Sacramento Counties). | | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.3-2a: Avoid Direct Loss of Swainson's Hawk and Other Raptor Nests.** To mitigate impacts on Swainson's hawk and other raptors (including burrowing owl), the project applicant(s) of all project phases shall retain a qualified biologist to conduct preconstruction surveys and to identify active nests on and within 0.5 mile of the SPA and active burrows on the SPA. The surveys shall be conducted before the approval of grading and/or improvement plans (as applicable) and no less than 14 days and no more than 30 days before the beginning of construction for all project phases. To the extent feasible, guidelines provided in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in the Central Valley (Swainson's Hawk Technical Advisory Committee 2000) shall be followed for surveys for Swainson's hawk. If no nests are found, no further mitigation is required.<br><br>If active nests are found, impacts on nesting Swainson's hawks and other raptors shall be avoided by establishing appropriate buffers around the nests. No project activity shall commence within the buffer area until the young have fledged, the nest is no longer active, or until a qualified biologist has determined in consultation with DFG that reducing the buffer would not result in nest abandonment. DFG guidelines recommend implementation of 0.25- or 0.5-mile-wide buffers, but the size of the buffer may be adjusted if a qualified biologist and the City, in consultation with DFG, determine that such an adjustment would not be likely to adversely affect the nest. Monitoring of the nest by a qualified biologist during and after construction activities will be required if the activity has potential to adversely affect the nest.<br><br>If active burrows are found, a mitigation plan shall be submitted to the City for review and approval before any ground-disturbing activities. The City shall consult with DFG. The mitigation plan may consist of installation of one-way doors on all burrows to allow owls to exit, but not reenter, and construction of artificial burrows within the project vicinity, as needed; however, burrow owl exclusions may only be used if a qualified biologist verifies that the burrow does not contain eggs or dependent young. If active burrows contain eggs and/or young, no construction shall occur within 50 feet of the burrow until young have fledged. Once it is confirmed that there are no owls inside burrows, these burrows may be collapsed. | | **Yes – See Biological Resources Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, or Caltrans), such that the performance criteria set forth in DFG's guidelines are determined to be met. | | | |
| **3A.3-2b: Prepare and Implement a Swainson's Hawk Mitigation Plan.** To mitigate for the loss of Swainson's hawk foraging habitat, the project applicant(s) of all project phases shall prepare and implement a Swainson's hawk mitigation plan including, but not limited to the requirements described below.<br><br>Before the approval of grading and improvement plans or before any ground-disturbing activities, whichever occurs first, the project applicant(s) shall preserve, to the satisfaction of the City or Sacramento County, as appropriate depending on agency jurisdiction, suitable Swainson's hawk foraging habitat to ensure 1:1 mitigation of habitat value for Swainson's hawk foraging habitat lost as a result of the project, as determined by the City, or Sacramento County, after consultation with DFG and a qualified biologist.<br><br>The 1:1 habitat value shall be based on Swainson's hawk nesting distribution and an assessment of habitat quality, availability, and use within the City's planning area, or Sacramento County jurisdiction. The mitigation ratio shall be consistent with the 1994 DFG *Swainson's Hawk Guidelines included in the Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California*, which call for the following mitigation ratios for loss of foraging habitat in these categories: 1:1 if within 1 mile of an active nest site, 0.75:1 if over 1 mile but less than 5 miles, and 0.5:1 if over 5 miles but less than 10 miles from an active nest site. Such mitigation shall be accomplished through credit purchase from an established mitigation bank approved to sell Swainson's hawk foraging habitat credits to mitigate losses in the SPA, if available, or through the transfer of fee title or perpetual conservation easement. The mitigation land shall be located within the known foraging area and within Sacramento County. The City, or Sacramento County if outside City jurisdiction, after consultation with DFG, will determine the appropriateness of the mitigation land. | | **Yes – See Biological Resources Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Before approval of such proposed mitigation, the City, or Sacramento County for the off-site detention basin, shall consult with DFG regarding the appropriateness of the mitigation. If mitigation is accomplished through conservation easement, then such an easement shall ensure the continued management of the land to maintain Swainson's hawk foraging values, including but not limited to ongoing agricultural uses and the maintenance of all existing water rights associated with the land. The conservation easement shall be recordable and shall prohibit any activity that substantially impairs or diminishes the land's capacity as suitable Swainson's hawk habitat.<br><br>The project applicant(s) shall transfer said Swainson's hawk mitigation land, through either conservation easement or fee title, to a third- party, nonprofit conservation organization (Conservation Operator), with the City and DFG named as third-party beneficiaries. The Conservation Operator shall be a qualified conservation easement land manager that manages land as its primary function. Additionally, the Conservation Operator shall be a tax-exempt nonprofit conservation organization that meets the criteria of Civil Code Section 815.3(a) and shall be selected or approved by the City or County, after consultation with DFG. The City, or County, after consultation with DFG and the Conservation Operator, shall approve the content and form of the conservation easement. The City, or County, DFG, and the Conservation Operator shall each have the power to enforce the terms of the conservation easement. The Conservation Operator shall monitor the easement in perpetuity to assure compliance with the terms of the easement.<br><br>The project applicant(s), after consultation with the City, or County of jurisdiction, DFG, and the Conservation Operator, shall establish an endowment or some other financial mechanism that is sufficient to fund in perpetuity the operation, maintenance, management, and enforcement of the conservation easement. If an endowment is used, either the endowment funds shall be submitted to the City for impacts on lands within the City's jurisdiction or Sacramento County for the off-site detention basin to be distributed to an appropriate third-party nonprofit conservation agency, or they shall be submitted directly to the third-party nonprofit conservation agency in exchange for an agreement to manage and maintain the | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| lands in perpetuity. The Conservation Operator shall not sell, lease, or transfer any interest of any conservation easement or mitigation land it acquires without prior written approval of the City and DFG. Mitigation lands established or acquired for impacts incurred at the off-site detention basin shall require approval from Sacramento County prior to sale or transfer of mitigation lands or conservation easement.<br><br>If the Conservation Operator ceases to exist, the duty to hold, administer, manage, maintain, and enforce the interest shall be transferred to another entity acceptable to the City and DFG, or Sacramento County and DFG depending on jurisdiction of the affected habitat. The City Planning Department shall ensure that mitigation habitat established for impacts on habitat within the City's planning area is properly established and is functioning as habitat by reviewing regular monitoring reports prepared by the Conservation Operator of the mitigation site(s). Monitoring of the mitigation site(s) shall continue for the first 10 years after establishment of the easement and shall be funded through the endowment, or other appropriate funding mechanism, established by the project applicant(s). Sacramento County shall review the monitoring reports for impacts on habitat at the off-site detention basin.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Sacramento County and Caltrans). | | | |
| **3A.3-2c: Avoid and Minimize Impacts to Tricolored Blackbird Nesting Colonies.** To avoid and minimize impacts to tricolored blackbird, the project applicant(s) of all project phases shall conduct a preconstruction survey for any project activity that would occur during the tricolored blackbird's nesting season (March 1–August 31). The preconstruction survey shall be conducted by a qualified biologist before any activity occurring within 500 feet of suitable nesting habitat, including freshwater marsh and areas of riparian scrub vegetation. The survey shall be conducted within 14 days before project activity begins.<br><br>If no tricolored blackbird colony is present, no further mitigation is required. If a | | **Yes – See Biological Resources Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| colony is found, the qualified biologist shall establish a buffer around the nesting colony. No project activity shall commence within the buffer area until a qualified biologist confirms that the colony is no longer active. The size of the buffer shall be determined in consultation with DFG. Buffer size is anticipated to range from 100 to 500 feet, depending on the nature of the project activity, the extent of existing disturbance in the area, and other relevant circumstances.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries (i.e., U.S. 50 interchange improvements) must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., Caltrans) and must be sufficient to achieve the performance criteria described above. | | | |
| **3A.3-2d: Avoid and Minimize Impacts to Special-Status Bat Roosts.** The project applicant of all project phases containing potential bat roosting habitat shall retain a qualified biologist to conduct surveys for roosting bats. Surveys shall be conducted in the fall to determine if the mine shaft is used as a hibernaculum and in spring and/or summer to determine if it is used as a maternity or day roost. Surveys shall consist of evening emergence surveys to note the presence or absence of bats and could consist of visual surveys at the time of emergence. If evidence of bat use is observed, the number and species of bats using the roost shall be determined. Bat detectors may be used to supplement survey efforts. If no bat roosts are found, then no further study shall be required.<br><br>If roosts of pallid bat or Townsend's big-eared bats are determined to be present and must be removed, the bats shall be excluded from the roosting site before the mine shaft is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures shall be developed in consultation with DFG before implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave but not reenter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). The loss of each roost (if any) will be replaced in consultation with DFG and may include construction and installation of bat boxes suitable to the bat species and colony size excluded from the original roosting site. Roost replacement will be implemented before bats are | **N/A – Project Specific Analysis Concluded *Less than Significant.*** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| excluded from the original roost sites. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost site, the mine shaft may be removed. | | | |
| **3A.3-2e: Obtain an Incidental Take Permit under Section 10(a) of ESA; Develop and Implement a Habitat Conservation Plan to Compensate for the Loss of Vernal Pool Habitat.** The project applicant(s) for all project phases shall obtain an incidental take permit under Section 10(a) of ESA. No project construction shall proceed in areas supporting potential habitat for Federally listed vernal pool invertebrates, or within adequate buffer areas (250 feet or lesser distance deemed sufficiently protective by a qualified biologist with approval from USFWS), until a BO has been issued by USFWS and the project applicant(s) have abided by conditions in the BO (including all conservation and minimization measures). Conservation and minimization measures are likely to include preparation of supporting documentation describing methods to protect existing vernal pools during and after project construction.<br><br>Under the No Federal Action Alternative, interagency consultation under Section 7 of ESA would not occur; therefore, the project applicant(s) would be required to develop a habitat conservation plan to mitigate impacts on Federally listed vernal pool invertebrates. The project applicant(s) shall complete and implement, or participate in, a habitat conservation plan that shall compensate for the loss of acreage, function, and value of affected vernal pool habitat. The habitat conservation plan shall be consistent with the goals of the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005) and must be approved by USFWS.<br><br>The project applicant(s) for all project phases shall ensure that there is sufficient upland habitat within the target areas for creation and restoration of vernal pools and vernal pool complexes to provide ecosystem health. The land used to satisfy this mitigation measure shall be protected through a fee title or conservation easement acceptable to the City and USFWS.<br><br>The project applicant(s) for all project phases shall identify the extent of indirectly affected vernal pool and seasonal wetland habitat, either by identifying all such habitat within 250 feet of project construction activities or by providing an | | **Yes – See Biological Resources Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| alternative technical evaluation in support of a lesser indirect impact distance. If a lesser distance is pursued, this distance shall be approved by USFWS. The project applicant(s) shall preserve 2 wetted acres of vernal pool habitat for each wetted acre of any indirectly affected vernal pool habitat. This mitigation shall occur before the approval of any grading or improvement plans for any project phase that would allow work within 250 feet of such habitat, and before any ground-disturbing activity within 250 feet of the habitat. The project applicant(s) will not be required to complete this mitigation measure for direct or indirect impacts that have already been mitigated to the satisfaction of USFWS through another BO or mitigation plan.<br><br>A standard set of BMPs shall be applied to construction occurring in areas within 250 feet of off-site vernal pool habitat, or within any lesser distance deemed adequate by a qualified biologist (with approval from USFWS) to constitute a sufficient buffer from such habitat. Refer to Section 3A.9, “Hydrology and Water Quality - Land” for the details of BMPs to be implemented.<br><br>Mitigation for the off-site elements outside of the City of Folsom’s jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties or Caltrans). | | | |
| **3A.3-2f: Obtain an Incidental Take Permit under Section 10(a) of ESA; Develop and Implement a Habitat Conservation Plan to Compensate for the Loss of VELB Habitat.** As long as valley elderberry longhorn beetle remains a species protected under ESA, the project applicant(s) of all project phases containing elderberry shrubs shall obtain an incidental take permit under Section 10(a) of ESA for valley elderberry longhorn beetle. No project construction shall proceed in areas potentially containing valley elderberry longhorn beetle until a BO has been issued by USFWS, and the project applicant(s) for all project phases have abided by all pertinent conditions in the take permit relating to the proposed construction, including all conservation and minimization measures.<br><br>Conservation and minimization measures are likely to include preparation of supporting documentation that describes methods for relocation of existing shrubs and maintaining existing shrubs and other vegetation in a conservation area. | **N/A – Project Specific Analysis Concluded *Less than Significant.*** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Under the No Federal Action Alternative, interagency consultation under Section 7 of ESA would not occur; therefore, the project applicant(s) would be required to develop a habitat conservation plan to mitigate impacts on valley elderberry longhorn beetle. The project applicant(s) shall complete and implement a habitat conservation plan that will compensate for the loss of valley elderberry longhorn beetle. Relocation of existing elderberry shrubs and planting of new elderberry seedlings shall be implemented on a no-net-loss basis. Detailed information on monitoring success of relocated and planted shrubs and measures to compensate (should success criteria not be met) would also likely be required in the BO. Ratios for mitigation of valley elderberry longhorn beetle habitat will ultimately be determined through the ESA Section 10(a) consultation process with USFWS, but shall be a minimum of "no net loss."<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries (i.e., U.S. 50 interchange improvements) must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Caltrans). | | | |
| **3A.3-2g: Secure Take Authorization for Federally Listed Vernal Pool Invertebrates and Implement All Permit Conditions.** No project construction shall proceed in areas supporting potential habitat for Federally listed vernal pool invertebrates, or within adequate buffer areas (250 feet or lesser distance deemed sufficiently protective by a qualified biologist with approval from USFWS), until a biological opinion (BO) or Not Likely to Adversely Affect (NLAA) letter has been issued by USFWS and the project applicant(s) for any particular discretionary development entitlements affecting such areas have abided by conditions in the BO (including conservation and minimization measures) intended to be completed before on-site construction. Conservation and minimization measures shall include preparation of supporting documentation describing methods to protect existing vernal pools during and after project construction, a detailed monitoring plan, and reporting requirements.<br><br>As described under Mitigation Measure 3A.3-1a, an MMP shall be developed that describes details how loss of vernal pool and other wetland habitats shall be offset, including details on creation of habitat, account for the temporal loss of habitat, | | **Yes – See Biological Resources Chapter.** | |

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## Russell Ranch Project

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| contain performance standards to ensure success, and outline remedial actions if performance standards are not met.<br><br>The project applicant(s) for any particular discretionary development application potentially affecting vernal pool habitat shall complete and implement a habitat MMP that will result in no net loss of acreage, function, and value of affected vernal pool habitat. The final habitat MMP shall be consistent with guidance provided in *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans within the Jurisdiction of the Sacramento Field Office, California* (USFWS 1996) or shall provide an alternative approach that is acceptable to the City, USACE, and USFWS and accomplishes no net loss of habitat acreage, function, and value.<br><br>The project applicant(s) for any particular discretionary development application "potentially affecting vernal pool habitat" shall ensure that there is sufficient upland habitat within the target areas for creation and restoration of vernal pools and vernal pool complexes to provide ecosystem health. This standard shall be accomplished by requiring the project applicant(s) for any discretionary development application affecting vernal pool or seasonal wetland habitat to identify the extent of indirectly affected vernal pool and seasonal wetland habitat, either by identifying all such habitat within 250 feet of project construction activities or by providing an alternative technical evaluation. If a lesser distance is pursued, this distance shall be approved by USFWS. The project applicant(s) shall preserve acreage of vernal pool habitat for each wetted acre of any indirectly affected vernal pool habitat at a ratio approved by USFWS at the conclusion of the Section 7 consultation. This mitigation shall occur before the approval of any grading or improvement plans for any project phase that would allow work within 250 feet of such habitat or lesser distance deemed sufficiently protective by a qualified biologist with approval from USFWS, and before any ground- disturbing activity within 250 feet of the habitat or lesser distance deemed sufficiently protective by a qualified biologist with approval from USFWS. The project applicant(s) will not be required to complete this mitigation measure for direct or indirect impacts that have already been mitigated to the satisfaction of USFWS through another BO or mitigation plan (i.e., if impacts on | | | |

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| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| specific habitat acreage are mitigated by one project phase or element, the project applicant(s) will not be required to mitigate for it again in another phase of the project).<br><br>A standard set of BMPs shall be applied to construction occurring in areas within 250 feet of off-site vernal pool habitat, or within any lesser distance deemed adequate by a qualified biologist (with approval from USFWS) to constitute a sufficient buffer from such habitat. Refer to Section 3A.9, "Hydrology and Water Quality - Land" for the details of BMPs to be implemented.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, or Caltrans). | | | |
| **3A.3-2h: Obtain Incidental Take Permit for Impacts on Valley Elderberry Longhorn Beetle and Implement All Permit Conditions.** Before each phase of the project, the project applicant(s) shall have a qualified biologist identify any elderberry shrubs within 100 feet of the project footprint and conduct a survey for valley elderberry longhorn beetle exit holes in stems greater than 1 inch in diameter. If no project activity, including grading or use of herbicides, would occur within 100 feet of an elderberry shrub, then no further mitigation shall be required for valley elderberry longhorn beetle in those areas.<br><br>If project activities would occur within 100 feet of any elderberry shrubs, consultation with USFWS under Section 7 will be required. No project construction shall proceed in areas potentially containing valley elderberry longhorn beetle until a BO has been issued by USFWS, and the project applicant(s) of all project phases have abided by all pertinent conditions in the BO relating to the proposed construction, including conservation and minimization measures, intended to be completed before on-site construction. Conservation and minimization measures are likely to include preparation of supporting documentation that describes methods for relocation of existing shrubs and maintaining existing shrubs and other vegetation in a conservation area.<br><br>Relocation of existing elderberry shrubs and planting of new elderberry seedlings | **N/A – Project Specific Analysis Concluded *Less than Significant.*** | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| shall be implemented consistent with the mitigation ratios described in the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999). The 1999 conservation guidelines mitigation ratios are based on whether the affected shrub is located in riparian or non-riparian habitat, the size of stems affected, and the presence of beetle exit holes. Compensatory mitigation for elderberry shrubs that would be removed from their current locations would be developed in consultation with USFWS during the Section 7 consultation process. Compensatory mitigation may include planting replacement elderberry seedlings or cuttings and associated native plants within the open space areas of the SPA, planting replacement elderberry seedlings or cuttings and associated native plants at a suitable off-site location, purchasing credits at an approved mitigation bank, or a combination thereof. Relocated and replacement shrubs and associated native plantings shall be placed in conservation areas providing a minimum of 1,800 square feet per transplanted shrub. These conservation areas shall be preserved in perpetuity as habitat for valley elderberry longhorn beetle. The number of elderberry shrubs that would be affected by implementing the project is expected to be low because there are currently a total of less than 10 shrubs known to be present on the SPA. Ratios for mitigation of valley elderberry longhorn beetle habitat will ultimately be determined through the ESA Section 7 consultation process with USFWS, but shall be a minimum of “no net loss.” USFWS uses stem count data, presence or absence of exit holes, and whether the affected elderberry shrubs are located in riparian habitat to determine the number of elderberry seedlings or cuttings and associated riparian vegetation that would need to be planted as compensatory mitigation for affected elderberry longhorn beetle habitat. The final VELB mitigation plan, including transplanting procedures, long-term protection, management of the mitigation areas, and monitoring procedures shall be consistent with the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999).<br><br>The population of valley elderberry longhorn beetles, the general condition of the conservation area, and the condition of the elderberry and associated native plantings in the conservation area must be monitored over a period of either ten consecutive years or for seven years over a 15-year period. A minimum survival rate of at least 60% of the elderberry plants and 60% of the associated native plants must be maintained throughout the monitoring period. Within one year of | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| discovering that survival has dropped below 60%, the project applicant(s) shall replace failed plantings to bring survival above this level. Detailed information on monitoring success of relocated and planted shrubs and measures to compensate (should success criteria not be met) would be required in the BO.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries (i.e., U.S. 50 interchange improvements) must be developed by the project applicant(s) of each applicable project phase in consultation with the affected oversight agency(ies) (i.e., Caltrans) and must be sufficient to achieve the performance criteria described above. | | | |
| **3A.3-3: Conduct Special-Status Plant Surveys; Implement Avoidance and Mitigation Measures or Compensatory Mitigation.** To mitigate for the potential loss or degradation of special-status plant species and habitat, the project applicant(s) for any particular discretionary development application shall adhere to the requirements described below.<br><br>• The project applicant(s) for any particular discretionary development application, including the proposed off-site elements, shall retain a qualified botanist to conduct protocol level preconstruction special-status plant surveys for all potentially occurring species. Preconstruction special-status plant surveys shall not be required for those portions of the SPA that have already been surveyed according to DFG and USFWS guidelines. If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter report to USFWS, DFG, the City of Folsom, Caltrans (for interchange improvements to U.S. 50), El Dorado County (for roadway connections in El Dorado County), and Sacramento County (for the off-site detention basin) and no further mitigation shall be required.<br>• If special-status plant populations are found, the project applicant(s) of affected developments shall consult with DFG and USFWS, as appropriate depending on species status, to determine the appropriate mitigation measures for direct and indirect impacts on any special- status plant population that could occur as a result of project implementation. Mitigation measures may include preserving and enhancing existing populations, creation of off-site populations on project mitigation sites through seed collection or | | **Yes – See Biological Resources Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| transplantation, and/or restoring or creating suitable habitat in sufficient quantities to achieve no net loss of occupied habitat or individuals.<br>• If potential impacts on special-status plant species are likely, a mitigation and monitoring plan shall be developed before the approval of grading plans or any ground-breaking activity within 250 feet of a special-status plant population. The mitigation plan shall be submitted to Caltrans (for interchange improvements to U.S. 50), El Dorado County (for impacts in roadway connections in El Dorado County), Sacramento County (for impacts in the off-site detention basin footprint), or the City of Folsom (for on-site impacts and all other off-site elements), for review and approval. It shall be submitted concurrently to DFG or USFWS, as appropriate depending on species status, for review and comment. The plan shall require maintaining viable plant populations on-site and shall identify avoidance measures for any existing population(s) to be retained and compensatory measures for any populations directly affected. Possible avoidance measures include fencing populations before construction and exclusion of project activities from the fenced-off areas, and construction monitoring by a qualified botanist to keep construction crews away from the population. The mitigation plan shall also include monitoring and reporting requirements for populations to be preserved on site or protected or enhanced off site.<br>• If relocation efforts are part of the mitigation plan, the plan shall include details on the methods to be used, including collection, storage, propagation, receptor site preparation, installation, long-term protection and management, monitoring and reporting requirements, and remedial action responsibilities should the initial effort fail to meet long-term monitoring requirements.<br>• If off-site mitigation includes dedication of conservation easements, purchase of mitigation credits or other off-site conservation measures, the details of these measures shall be included in the mitigation plan, including information on responsible parties for long- term management, conservation easement holders, long-term management requirements, and other details, as appropriate to target the preservation on long term viable populations.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| project phase with the affected oversight agency(ies) (i.e., Caltrans, El Dorado and/or Sacramento Counties). | | | |
| **3A.3-4a: Secure and Implement Section 1602 Streambed Alteration Agreement.** The project applicant(s) for any particular discretionary development application shall obtain a Section 1602 streambed alteration agreement from DFG for all construction activities that would occur in the bed and bank of Alder Creek and other drainage channels and ponds on the SPA. As a condition of issuance of the streambed alteration agreement, the project applicant(s) for any particular discretionary development application affecting riparian habitat shall hire a qualified restoration ecologist to prepare a riparian habitat MMP. The draft MMP shall describe specific method(s) to be implemented to avoid and/or compensate for impacts on the stream channel of Alder Creek and other drainage channels within DFG jurisdiction, and the bed and banks of the on-site ponds. Mitigation measures may include establishment or restoration of riparian habitat within the project's open space areas along preserved stream corridors, riparian habitat restoration off-site, or preservation and enhancement of existing riparian habitat either on or off the SPA. The compensation habitat shall be similar in composition and structure to the habitat to be removed and shall be at ratios adequate to offset the loss of riparian habitat functions and services at the SPA. The riparian habitat compensation section of the habitat MMP shall include the following:<br><br>• compensatory mitigation sites and criteria for selecting these mitigation sites;<br>• complete assessment of the existing biological resources in both the on-site and off-site preservation and restoration areas;<br>• site-specific management procedures to benefit establishment and maintenance of native riparian plant species, including black willow, arroyo willow, white alder, and Fremont cottonwood;<br>• a planting and irrigation program if needed for establishment of native riparian trees and shrubs at strategic locations within each mitigation site (planting and irrigation may not be necessary if preservation of functioning riparian habitat is chosen as mitigation or if restoration can be accomplished without irrigation or planting);<br>• in kind reference habitats for comparison with compensatory riparian habitats | | **Yes – See Biological Resources Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| (using performance and success criteria) to document success;<br>• monitoring protocol, including schedule and annual report requirements (compensatory riparian habitats shall be monitored for a minimum period of five years);<br>• ecological performance standards, based on the best available science and including specifications for native riparian plant densities, species composition, amount of dead woody vegetation gaps and bare ground, and survivorship; at a minimum, compensatory mitigation planting sites must achieve 80% survival of planted riparian trees and shrubs by the end of the five-year maintenance and monitoring period or dead and dying trees shall be replaced and monitoring continued until 80% survivorship is achieved;<br>• corrective measures if performance standards are not met;<br>• responsible parties for monitoring and preparing reports; and<br>• responsible parties for receiving and reviewing reports and for verifying success or prescribing implementation or corrective actions.<br><br>Any conditions of issuance of the Streambed Alteration Agreement shall be implemented as part of project construction activities that adversely affect the bed and bank and riparian habitat associated with Alder Creek and other drainage channels and ponds that are within the project area that is subject to DFG jurisdiction. The agreement shall be executed by the project applicant(s) and DFG before the approval of any grading or improvement plans or any construction activities in any project phase that could potentially affect the bed and bank of Alder Creek and other on-site or off-site drainage channels under DFG jurisdiction and their associated freshwater marsh and riparian habitat.<br><br>Mitigation for the U.S. 50 interchange improvements must be coordinated by the project applicant(s) of each applicable project phase with the Caltrans. | | | |
| **3A.3-4b: Conduct Surveys to Identify and Map Valley Needlegrass Grassland; Implement Avoidance and Minimization Measures or Compensatory Mitigation.** The project applicant(s) of all project phases shall retain a qualified botanist to conduct preconstruction surveys to determine if valley needlegrass grassland is present on the SPA. This could be done concurrently with any special-status plant surveys conducted on site as special- | | **Yes – See Biological Resources Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| status plant surveys are floristic in nature, i.e. require that all species encountered be identified, and require preparation of a plant community map. If valley needlegrass grassland is not found on the SPA, the botanist shall document the findings in a letter report to the City of Folsom, and no further mitigation shall be required. Valley needlegrass grassland was not found in any of the off-site project elements.<br><br>If valley needlegrass grassland is found on the SPA, the location and extent of the community shall be mapped and the acreage of this community type, if any, that would be removed by project implementation shall be calculated. The project applicant(s) for any particular discretionary development application affecting valley needlegrass grassland shall consult with DFG and the City of Folsom to determine appropriate mitigation for removal of valley needlegrass grassland resulting from project implementation. Mitigation measures shall include one or more of the following components sufficient to achieve no net loss of valley needlegrass grassland acreage: establishment of valley needlegrass grassland within project's open space areas currently characterized by annual grassland, establishment of valley needlegrass grassland off-site, or preservation and enhancement of existing valley needlegrass grassland either on or off the SPA. The applicant(s) shall compensate for any loss of valley needlegrass grassland resulting from project implementation at a minimum 1:1 replacement ratio. | | | |
| **3A.3-5: Conduct Tree Survey, Prepare and Implement an Oak Woodland Mitigation Plan, Replace Native Oak Trees Removed, and Implement Measures to Avoid and Minimize Indirect Impacts on Oak Trees Retained On Site.** The project applicant(s) shall prepare an oak woodland mitigation and monitoring plan. The project applicant(s) of all on- and off-site project phases containing oak woodland habitat or individual trees shall adhere to the requirements described below, which are consistent with those outlined in California Public Resources Code 21083.4.<br><br>Pursuant to Sacramento County General Plan policy, the acreage of oak woodland habitat for determining impacts and mitigation requirements was calculated as the oak tree canopy area within stands of oak trees having greater than 10% cover plus a 30-foot-radius buffer measured from the outer edge of the tree canopy. Oak trees located in areas greater than 30 feet from stands meeting the greater | **N/A – Oak woodland is not located on-site and only one black willow that is not protected, is proposed for removal.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| than 10% tree canopy cover criterion were considered isolated trees and not part of the blue oak woodland community. Mitigation for impacts on isolated oak trees is discussed separately below.<br><br>• Preserve approximately 399 acres of existing oak woodland habitat in the SPA (this acreage is based on the extent of oak woodland habitat as determined from aerial photograph interpretation; however, following completion of ground verification by a qualified arborist, the actual amount of oak woodland present within impact areas could be slightly greater or lesser than the amount calculated from aerial photograph and, therefore, the amount preserved could also be slightly greater or lesser than 399 acres).<br>• Create 243 acres of oak woodland habitat in the SPA by planting a combination of blue oak acorns, seedlings, and trees in the following SPA locations:<br>i. Non-wooded areas that are adjacent to or contiguous with the existing oak woodland habitat.<br>ii. Preserve and passive open space zones throughout the SPA.<br>iii. Open space areas that are adjacent to existing oak woodlands that will be impacted by project grading (i.e. catch slopes).<br>iv. Other practical locations within the SPA in or adjacent to open space.<br><br>**Oak Woodlands Mitigation Planting Criteria**<br><br>The following oak woodland mitigation planting criteria shall be used to create oak woodland habitat:<br>i. A minimum of 55 planting sites per acre (with a total of 70 units, as defined below) will mitigate for one acre of oak woodland impacts. A combination of acorns, seedlings, and various sizes of container trees (#1 container, #5 container, #15 container) or transplanted trees shall be incorporated into the planting design. Mitigation acreage that is planted solely with larger oak trees (no acorns) shall have a minimum of 35 planting sites per acre. The units are defined as follows:<br>- One established acorn equals one unit (acorns will be over planted to maximize potential germination).<br>- One oak seedling equals one unit. | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| - One #1 container oak tree equals two units.<br>- One #5 container oak tree equals three units.<br>- One #15 container oak tree equals four units.<br>- One 24-inch boxed oak tree equals six units.<br>- One transplanted oak tree equals four units per trunk diameter inch (dbh).<br>- Native non oak species characteristic of oak woodlands shall be included in the mitigation planting plan to augment overall habitat values. Each non oak tree species shall represent unit values described above for oak trees, but non oak species shall comprise no more than 10% of the mitigation plantings.<br>• Preserve and protect existing off-site oak woodland habitat. Existing, unprotected oak woodland habitat within Sacramento and El Dorado Counties may be secured and placed under conservation easement in lieu of onsite mitigation measures if necessary. The off-site locations would be managed as oak woodland habitat in perpetuity.<br>• Create oak woodlands off site. Plant a combination of blue oak acorns, seedlings, and trees at off-site location(s), if needed to achieve the creation goal of 243 acres of new blue oak woodland habitat. This measure would only be needed if 243 acres of blue oak woodland could not be created in the SPA. Off-site creation shall follow the same guidelines as outlined in the Mitigation Planting Criteria for on-site creation. Off-site tree planting shall occur at sites within Sacramento County that should naturally support blue oak woodland and shall be used to restore former blue oak woodland habitat that has been degraded or removed through human activities. Restoration shall be designed to result in species composition and densities similar to those in the SPA prior to project development. Planted areas shall be placed under conservation easement and managed as oak woodland habitat in perpetuity.<br>• The oak woodland mitigation plan prepared by the project applicant(s) shall include a maintenance and monitoring program for any replacement trees. The program shall include monitoring and reporting requirements, schedule, and success criteria. Replacement oak trees shall be maintained and | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| monitored for a minimum of eight years from the date of planting and irrigation shall be provided to planted trees for the first five years after planting. Any replacement trees that die during the monitoring period shall be replaced in sufficient numbers to achieve 80% survival rate for planted trees by the end of the eight-year maintenance and monitoring period. Dead and dying trees shall be replaced and monitoring continued until 80% survivorship is achieved. Security acceptable to the City and sufficient to cover maintenance and monitoring costs for eight years shall be provided to the City Planning Department. The security will be forfeited if the project applicant or designated responsible party fails to provide maintenance and monitoring and meet the success criteria.<br><br>**Isolated Oak Tree Mitigation**<br><br>The project applicant(s) of all on-site project phases containing oak woodland habitat or isolated trees and the off-site Prairie City Road and Oak Avenue interchange improvements to U.S. 50; Rowberry Drive Overcrossing; and the underground sewer force main shall develop a map depicting the tree canopy of all oak trees in the survey area and identifying the acreage of tree canopy that would be preserved and the acreage that would be removed. A tree permit for removal of isolated oak trees (those not located within the delineated boundary of oak woodland habitat) shall be obtained from the City Planning Director. As a condition of the tree removal permit, project applicant(s) shall be required to develop a Planting and Maintenance Agreement. The City's Tree Preservation Code requires compensatory mitigation and the City and the project applicants have developed a plan, as set forth Section 10 of the Folsom Plan Area Specific Plan (attached to this EIR/EIS as Appendix N) specifically to avoid and minimize adverse effects on isolated oak trees from project development and to provide compensatory mitigation for removal of protected trees in the SPA. In addition to the language contained in the Folsom Plan Area Specific Plan, the following elements shall be included in a protected tree mitigation plan to be developed by the project applicants and agreed upon by the City:<br><br>• Project applicant(s) of projects containing isolated oak trees shall retain a certified arborist or registered professional forester to perform a determinate | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| survey of tree species, size (dbh), condition, and location for all areas of the project site proposed for tree removal and encroachment of development. The condition of individual trees shall be assessed according to the American Society of Consulting Arborists rating system with the following added explanations:<br>5) Excellent; No problems – tree has no structural problems, branches are properly spaced and tree characteristics are nearly perfect for the species.<br>4) Good; No apparent problems – tree is in good condition and no apparent problems from visual inspection. If potential structural or health problems are tended at this stage, future hazard can be reduced and more serious health problems can be averted.<br>3) Fair; Minor problems – There are some minor structural or health problems that pose no immediate danger. When the recommended actions in an arborist report are completed correctly the defect(s) can be minimized or eliminated.<br>2) Poor; Major problems – the tree is in poor condition, but the condition could be improved with correct arboricultural work including, but not limited to: pruning, cabling, bracing, bolting, guying, spraying, mistletoe removal, vertical mulching, and fertilization. If the recommended actions are completed correctly, hazard can be reduced and the rating can be elevated to a 3. If no action is taken the tree is considered a liability and should be removed.<br>1) Hazardous or non correctable condition – the tree is in extremely poor condition and in non-reversible decline. This rating is assigned to a tree that has structural and/or health problems that no amount of tree care work or effort can change. The issues may or may not be considered a dangerous situation. The tree may also be infested with a disease or pest(s) that is non-controllable at this time and is causing an unacceptable risk of spreading the disease or pests(s) to other trees.<br>0) Dead – the tree has no significant signs of life (dead or very close to being dead).<br><br>**Isolated Oak Tree Mitigation Planting Criteria** | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| • The determination for whether an isolated tree shall be preserved, removed without compensation, or removed with compensatory mitigation shall be based on the condition and size of the tree as follows:<br>i. Trees rated 0 or 1 may be removed with no mitigation.<br>ii. Trees rated 2 may be removed at 50% of the normal Folsom Municipal Code mitigation.<br>iii. Trees rated 3, 4, and/or 5 may be removed at the normal Folsom Municipal Code mitigation.<br>iv. Native isolated oaks measuring 24 inches or greater dbh for a single trunk or 40 inches or more for a multi-trunked tree and rated a 3 to5 shall be retained, unless retaining wall(s) higher than 4 feet tall (from bottom of footing to the top of the wall) would be required to protect the tree(s) from mass grading of the SPA properties.<br>v. Native oaks measuring between 12 and 24 inches dbh and rated a 4 or 5 shall not be removed or mitigated unless wall(s) higher than 4 feet tall (from bottom of footing to the top of the wall) would be required to protect the tree(s) from mass grading of the SPA properties. Trees in this size class but rated 2 or 3 shall not be removed unless unreasonable costs to save the tree(s) (greater than the cost of implementing the isolated oak tree mitigation planting criteria described here) would result.<br>vi. Native oaks measuring 5 inches or greater dbh but less than 12 inches dbh shall not be removed unless unreasonable costs to save the tree(s) (greater than the cost of implementing the isolated oak tree mitigation planting criteria described here) would result.<br>vii. Native oak trees measuring 1 inch or greater dbh but less than 5 inches dbh may be preserved to receive a Small Tree Preservation Credit (STPC). Any tree that is to be considered for preservation credit shall be evaluated, included in the arborist report, and shall have been found to be rated a 3, 4, or a 5. Credits shall only be accepted if the tree protection zone (TPZ) (i.e., the outer edge of the tree canopy drip line) is protected with fencing in the exact manner that 5 inches dbh and greater trees are protected on a construction site, and the spacing is equal to the proper tree spacing dictated by the Folsom Master Tree List. STPC shall not count if they the tree is in a poor growing space | | | |

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| due to its position within the TPZ of another protected tree to be preserved. The City shall accept the preservation of native oak trees in this size class as credit towards the total removed inches based on the following STPC criteria: | | | |

| Caliper of Tree Preserved | Mitigation Tree Credit Equivalent |
|---|---|
| 1 inch or greater, but less than 2 inches | One #15 container tree or two #5 |
| 2 inches or greater, but less than 3 | Two #15 container trees |
| 3 inches or greater, but less than 4 | Three #15 container trees |
| 4 inches or greater, but less than 5 | Four #15 container trees |

- Folsom Municipal Code requires one of the following be planted as compensation for each diameter inch of protected tree removed:
  i. half of a 24-inch box tree;
  ii. one #15 container tree;
  iii. two #5 container trees; or
  iv. $150 in-lieu payment or other fee set by City Council Resolution.
- The Planting and Maintenance Agreement shall include a planting plan, planting and irrigation design details, and a weaning schedule for the establishment period. The plan shall include a 5-year establishment period for trees and 8 years for planted acorns with an annual monitoring report that includes corrections needed with proposed work plan, and notice of compliance within 90-days of annual monitoring report. Security in an form acceptable to the City and sufficient to cover maintenance and monitoring costs for eight years shall be provided to the City Planning Department. The security will be forfeited if the project applicant or designated responsible party fails to fulfill the Planting and Maintenance Agreement.
- To avoid and minimize indirect impacts on protected trees to remain on the SPA, the project applicant(s) of all affected project phases shall install high visibility fencing outside the outer edge of the drip lines of all trees to be retained on the SPA during project construction. The fencing may be installed around groups or stands of trees or whole wooded areas bust must be installed so that the drip lines of all trees are protected. Grading, trenching, equipment or materials storage, parking, paving, irrigation, and landscaping

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| shall be prohibited within the fenced areas (i.e. drip lines of protected trees). If the activities listed cannot be avoided within the drip line of a particular tree, that tree shall be counted as an affected tree and compensatory mitigation shall be provided, or the tree in question shall be monitored for a period of five years and replaced only if the tree appears to be dead or dying within five years of project implementation.<br><br>Through a combination of the mitigation options presented above along with the proposed on-site preservation of blue oak woodland habitat in the open space areas, the project applicant(s) can satisfy the mitigation requirements for removal of trees protected under the Folsom Municipal Code while also mitigating the impacts on oak woodland habitat, as determined through consultation with the Sacramento County Planning Department (for County off-site impacts only) and/or the City of Folsom.<br><br>Mitigation for the U.S. 50 interchange improvements must be coordinated by the project applicant(s) of each applicable project phase with Caltrans. | | | |
| **3A.4 Climate Change - Land** | | | |
| **3A.4-1: Implement Additional Measures to Control Construction-Generated GHG Emissions.** To further reduce construction-generated GHG emissions, the project applicant(s) any particular discretionary development application shall implement all feasible measures for reducing GHG emissions associated with construction that are recommended by SMAQMD at the time individual portions of the site undergo construction. Such measures may reduce GHG exhaust emissions from the use of on-site equipment, worker commute trips, and truck trips carrying materials and equipment to and from the SPA, as well as GHG emissions embodied in the materials selected for construction (e.g., concrete). Other measures may pertain to the materials used in construction. Prior to releasing each request for bid to contractors for the construction of each discretionary development entitlement, the project applicant(s) shall obtain the most current list of GHG reduction measures that are recommended by SMAQMD and stipulate that these measures be implemented in the respective request for bid as well as the subsequent construction contract with the selected primary contractor. The project applicant(s) for any particular discretionary development application may submit to the City and SMAQMD a report that | **N/A – Project Specific Analysis Concluded *Less than Significant.*** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| substantiates why specific measures are considered infeasible for construction of that particular development phase and/or at that point in time. The report, including the substantiation for not implementing particular GHG reduction measures, shall be approved by the City, in consultation with SMAQMD prior to the release of a request for bid by the project applicant(s) for seeking a primary contractor to manage the construction of each development project. By requiring that the list of feasible measures be established prior to the selection of a primary contractor, this measure requires that the ability of a contractor to effectively implement the selected GHG reduction measures be inherent to the selection process.<br><br>SMAQMD's recommended measures for reducing construction-related GHG emissions at the time of writing this EIR/EIS are listed below and the project applicant(s) shall, at a minimum, be required to implement the following:<br><br>• Improve fuel efficiency from construction equipment:<br>i. reduce unnecessary idling (modify work practices, install auxiliary power for driver comfort);<br>ii. perform equipment maintenance (inspections, detect failures early, corrections);<br>iii. train equipment operators in proper use of equipment;<br>iv. use the proper size of equipment for the job; and<br>v. use equipment with new technologies (repowered engines, electric drive trains).<br>• Use alternative fuels for electricity generators and welders at construction sites such as propane or solar, or use electrical power.<br>• Use an ARB-approved low-carbon fuel, such as biodiesel or renewable diesel for construction equipment. (Emissions of oxides of nitrogen [$NO_X$] emissions from the use of low carbon fuel must be reviewed and increases mitigated.) Additional information about low- carbon fuels is available from ARB's Low Carbon Fuel Standard Program (ARB 2009b).<br>• Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.<br>• Reduce electricity use in the construction office by using compact fluorescent | | | |

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| bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.<br>• Recycle or salvage non-hazardous construction and demolition debris (goal of at least 75% by weight).<br>• Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials).<br>• Minimize the amount of concrete used for paved surfaces or use a low carbon concrete option.<br>• Produce concrete on-site if determined to be less emissive than transporting ready mix.<br>• Use EPA-certified SmartWay trucks for deliveries and equipment transport. Additional information about the SmartWay Transport Partnership Program is available from ARB's Heavy-Duty Vehicle Greenhouse Gas Measure (ARB 2009c) and EPA (EPA 2009).<br>• Develop a plan in consultation with SMAQMD to efficiently use water for adequate dust control. This may consist of the use of non- potable water from a local source.<br><br>In addition to SMAQMD-recommended measures, construction activity shall comply with all applicable rules and regulations established by SMAQMD and ARB. | | | |
| **3A.4-2a: Implement Additional Measures to Reduce Operational GHG Emissions.** Each increment of new development within the project site requiring a discretionary approval (e.g., proposed tentative subdivision map, conditional use permit), shall be subject to a project-specific environmental review (which could support an applicable exemption, negative or mitigated negative declaration or project-specific EIR) and will require that GHG emissions from operation of each phase of development, including supporting roadway and infrastructure improvements that are part of the selected action alternative, will be reduced by an amount sufficient to achieve the 2020-based threshold of significance of 4.36 $CO_2e$/SP/year for development that would become operational on or before the year 2020, and the 2030-based threshold of significance of 2.86 $CO_2e$/SP/year for development that would become operational on or before the year 2030. | **N/A – Project Specific Analysis Concluded *Less than Significant.*** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| The above-stated thresholds of significance may be subject to change if SMAQMD approves its own GHG significance thresholds, in which case, SMAQMD-adopted thresholds will be used. The amount of GHG reduction required to achieve the applicable significance thresholds will furthermore depend on existing and future regulatory measures including those developed under AB 32).<br><br>For each increment of new discretionary development, the City shall submit to the project applicant(s) a list of potentially feasible GHG reduction measures to be considered in the development design. The City's list of potentially feasible GHG reduction measures shall reflect the current state of the regulatory environment, available incentives, and thresholds of significance that may be developed by SMAQMD, which will evolve under the mandate of AB 32 and Executive Order S-3-05. If the project applicant(s) asserts it cannot meet the 2020-based goal, then the report shall also demonstrate why measures not selected are considered infeasible. The City shall review and ensure inclusion of the design features in the proposed project before applicant(s) can receive the City's discretionary approval for the any increment of development. In determining what measures should appropriately be imposed by the City under the circumstances, the City shall consider the following factors:<br><br>• the extent to which rates of GHG emissions generated by motor vehicles traveling to, from, and within the SPA are projected to decrease over time as a result of regulations, policies, and/or plans that have already been adopted or may be adopted in the future by ARB or other public agency pursuant to AB 32, or by EPA;<br>• the extent to which mobile-source GHG emissions, which at the time of writing this EIR/EIS comprise a substantial portion of the state's GHG inventory, can also be reduced through design measures that result in trip reductions and reductions in trip length;<br>• the extent to which GHG emissions emitted by the mix of power generation operated by SMUD, the electrical utility that will serve the SPA, are projected to decrease pursuant to the Renewables Portfolio Standard required | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| by SB 1078 and SB 107, as well as any future regulations, policies, and/or plans adopted by the federal and state governments that reduce GHG emissions from power generation;<br>• the extent to which any stationary sources of GHG emissions that would be operated on a proposed land use (e.g., industrial) are already subject to regulations, policies, and/or plans that reduce GHG emissions, particularly any future regulations that will be developed as part of ARB's implementation of AB 32, or other pertinent regulations on stationary sources that have the indirect effect of reducing GHG emissions;<br>• the extent to which other mitigation measures imposed on the project to reduce other air pollutant emissions may also reduce GHG emissions;<br>• the extent to which the feasibility of existing GHG reduction technologies may change in the future, and to which innovation in GHG reduction technologies will continue, effecting cost-benefit analyses that determine economic feasibility; and<br>• whether the total costs of proposed mitigation for GHG emissions, together with other mitigation measures required for the proposed development, are so great that a reasonably prudent property owner would not proceed with the project in the face of such costs.<br><br>In considering how much, and what kind of, mitigation is necessary in light of these factors, the City shall consider the following list of options, though the list is not intended to be exhaustive, as GHG emission reduction strategies and their respective feasibility are likely to evolve over time. These measures are derived from multiple sources including the Mitigation Measure Summary in Appendix B of the California Air Pollution Control Officer's Association (CAPCOA) white paper, CEQA & Climate Change (CAPCOA 2009a); CAPCOA's Model Policies for Greenhouse Gases in General Plans (CAPCOA 2009b); and the California Attorney General's Office publication, The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level (California Attorney General's Office 2008).<br><br>**Energy Efficiency** | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| Include clean alternative energy features to promote energy self-sufficiency (e.g., photovoltaic cells, solar thermal electricity systems, small wind turbines).<br><br>• Design buildings to meet CEC Tier II requirements (e.g., exceeding the requirements of the Title 24 [as of 2007] by 35%).<br>• Site buildings to take advantage of shade and prevailing winds and design landscaping and sun screens to reduce energy use.<br>• Install efficient lighting in all buildings (including residential). Also install lighting control systems, where practical. Use daylight as an integral part of lighting systems in all buildings.<br>• Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes.<br><br>**Water Conservation and Efficiency**<br><br>• With the exception of ornamental shade trees, use water-efficient landscapes with native, drought-resistant species in all public area and commercial landscaping. Use water-efficient turf in parks and other turf-dependant spaces.<br>• Install the infrastructure to use reclaimed water for landscape irrigation and/or washing cars.<br>• Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.<br>• Design buildings and lots to be water-efficient. Only install water-efficient fixtures and appliances.<br>• Restrict watering methods (e.g., prohibit systems that apply water to nonvegetated surfaces) and control runoff. Prohibit businesses from using pressure washers for cleaning driveways, parking lots, sidewalks, and street surfaces. These restrictions should be included in the Covenants, Conditions, and Restrictions of the community.<br>• Provide education about water conservation and available programs and incentives.<br>• To reduce stormwater runoff, which typically bogs down wastewater treatment systems and increases their energy consumption, construct driveways to single-family detached residences and parking lots and | | | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| driveways of multifamily residential uses with pervious surfaces. Possible designs include Hollywood drives (two concrete strips with vegetation or aggregate in between) and/or the use of porous concrete, porous asphalt, turf blocks, or pervious pavers.<br><br>**Solid Waste Measures**<br><br>• Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).<br>• Provide interior and exterior storage areas for recyclables and green waste at all buildings.<br>• Provide adequate recycling containers in public areas, including parks, school grounds, golf courses, and pedestrian zones in areas of mixed-use development.<br>• Provide education and publicity about reducing waste and available recycling services.<br><br>**Transportation and Motor Vehicles**<br><br>• Promote ride-sharing programs and employment centers (e.g., by designating a certain percentage of parking spaces for ride-sharing vehicles, designating adequate passenger loading and unloading zones and waiting areas for ride-share vehicles, and providing a Web site or message board for coordinating ride-sharing).<br>• Provide the necessary facilities and infrastructure in all land use types to encourage the use of low- or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).<br>• At industrial and commercial land uses, all forklifts, “yard trucks,” or vehicles that are predominately used on-site at non-residential land uses shall be electric-powered or powered by biofuels (such as biodiesel [B100]) that are produced from waste products, or shall use other technologies that do not rely on direct fossil fuel consumption. | | | |
| **3A.4-2b: Participate in and Implement an Urban and Community Forestry Program and/or Off-Site Tree Program to Off-Set Loss of On-Site Trees.** The | **N/A – Oak woodland is not located on-site and** | | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| trees on the project site contain sequestered carbon and would continue to provide future carbon sequestration during their growing life. For all harvestable trees that are subject to removal, the project applicant(s) for any particular discretionary development application shall participate in and provide necessary funding for urban and community forestry program (such as the UrbanWood program managed by the Urban Forest Ecosystems Institute [Urban Forest Ecosystems Institute 2009]) to ensure that wood with an equivalent carbon sequestration value to that of all harvestable removed trees is harvested for an end-use that would retain its carbon sequestration (e.g., furniture building, cabinet making). For all non-harvestable trees that are subject to removal, the project applicant(s) shall develop and fund an off-site tree program that includes a level of tree planting that, at a minimum, increases carbon sequestration by an amount equivalent to what would have been sequestered by the blue oak woodland during its lifetime. This program shall be funded by the project applicant(s) of each development phase and reviewed for comment by an independent Certified Arborist unaffiliated with the project applicant(s) and shall be coordinated with the requirements of Mitigation Measure 3.3-5, as stated in Section 3A.3, “Biological Resources - Land.” Final approval of the program shall be provided by the City. Components of the program may include, but not be limited to, providing urban tree canopy in the City of Folsom, or reforestation in suitable areas outside the City. Reforestation in natural habitat areas outside the City of Folsom would simultaneously mitigate the loss of oak woodland habitat while planting trees within the urban forest canopy would not. The California Urban Forestry Greenhouse Gas Reporting Protocol shall be used to assess this mitigation program (CCAR 2008). All unused vegetation and tree material shall be mulched for use in landscaping on the project site, shipped to the nearest composting facility, or shipped to a landfill that is equipped with a methane collection system, or combusted in a biomass power plant. Tree and vegetative material should not be burned on- or off-site unless used as fuel in a biomass power plant. | **only one black willow that is not protected, is proposed for removal.** | | |
| **3A.5 Cultural Resources - Land** | | | |
| **3A.5-1a: Comply with the Programmatic Agreement.** The PA for the proposed project is incorporated by reference. The PA provides a management framework | | **Yes – See Cultural Resources Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| for identifying historic properties, determining adverse effects, and resolving those adverse effects as required under Section 106 of the NHPA. This document is incorporated by reference. The PA is available for public inspection and review at the California Office of Historic Preservation 1725 23rd Street Sacramento, CA 95816. | | | |
| **3A.5-1b: Perform an Inventory and Evaluation of Cultural Resources for the California Register of Historic Places, Minimize or Avoid Damage or Destruction, and Perform Treatment Where Damage or Destruction Cannot be Avoided.** Management of cultural resources eligible for or listed on the CRHR under CEQA mirrors management steps required under Section 106. These steps may be combined with deliverables and management steps performed for Section 106 provided that management documents prepared for the PA also clearly reference the CRHR listing criteria and significance thresholds that apply under CEQA. Prior to ground- disturbing work for each individual development phase or off-site element, the applicable oversight agency (City of Folsom, El Dorado County, Sacramento County, or Caltrans), or the project applicant(s) of all project phases, with applicable agency oversight, shall perform the following actions:<br><br>• Retain the services of a qualified archaeologist to perform an inventory of cultural resources within each individual development phase or off-site element subject to approval under CEQA. Identified resources shall be evaluated for listing on the CRHR. The inventory report shall also identify locations that are sensitive for undiscovered cultural resources based upon the location of known resources, geomorphology, and topography. The inventory report shall specify the location of monitoring of ground-disturbing work in these areas by a qualified archaeologist, and monitoring in the vicinity of identified resources that may be damaged by construction, if appropriate. The identification of sensitive locations subject to monitoring during construction of each individual development phase shall be performed in concert with monitoring activities performed under the PA to minimize the potential for conflicting requirements.<br>• For each resource that is determined eligible for the CRHR, the applicable agency or the project applicant(s) for any particular discretionary development (under the agency's direction) shall obtain the services of a | | | **Yes – Discussed in the Cultural Resources Chapter.** |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| qualified archaeologist who shall determine if implementation of the individual project development would result in damage or destruction of "significant" (under CEQA) cultural resources. These findings shall be reviewed by the applicable agency for consistency with the significance thresholds and treatment measures provided in this EIR/EIS.<br>• Where possible, the project shall be configured or redesigned to avoid impacts on eligible or listed resources. Alternatively, these resources may be preserved in place if possible, as suggested under California Public Resources Code Section 21083.2. Avoidance of historic properties is required under certain circumstances under the Public Resource Code and 36 CFR Part 800.<br>• Where impacts cannot be avoided, the applicable agency or the project applicant(s) of all project phases (under the applicable agency's direction) shall prepare and implement treatment measures that are determined to be necessary by a qualified archaeologist. These measures may consist of data recovery excavations for resources that are eligible for listing because of the data they contain (which may contribute to research). Alternatively, for historical architectural, engineered, or landscape features, treatment measures may consist of a preparation of interpretive, narrative, or photographic documentation. These measures shall be reviewed by the applicable oversight agency for consistency with the significance thresholds and standards provided in this EIR/EIS.<br>• To support the evaluation and treatment required under this mitigation measure, the archaeologist retained by either the applicable oversight agency or the project applicant(s) of all project phases shall prepare an appropriate prehistoric and historic context that identifies relevant prehistoric, ethnographic, and historic themes and research questions against which to determine the significance of identified resources and appropriate treatment.<br>• These steps and documents may be combined with the phasing of management and documents prepared pursuant to the PA to minimize the potential for inconsistency and duplicative management efforts.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| Sacramento Counties, or Caltrans). | | | |
| **3A.5-2: Conduct Construction Personnel Education, Conduct On-Site Monitoring if Required, Stop Work if Cultural Resources are Discovered, Assess the Significance of the Find, and Perform Treatment or Avoidance as Required.** To reduce potential impacts to previously undiscovered cultural resources, the project applicant(s) of all project phases shall do the following:<br><br>• Before the start of ground-disturbing activities, the project applicant(s) of all project phases shall retain a qualified archaeologist to conduct training for construction workers as necessary based upon the sensitivity of the project APE, to educate them about the possibility of encountering buried cultural resources, and inform them of the proper procedures should cultural resources be encountered.<br>• As a result of the work conducted for Mitigation Measures 3A.5-1a and 3A.5-1b, if the archaeologist determines that any portion of the SPA or the off-site elements should be monitored for potential discovery of as-yet-unknown cultural resources, the project applicant(s) of all project phases shall implement such monitoring in the locations specified by the archaeologist. USACE should review and approve any recommendations by archaeologists with respect to monitoring.<br>• Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, or architectural remains be encountered during any construction activities, work shall be suspended in the vicinity of the find and the appropriate oversight agency(ies) (identified below) shall be notified immediately. The appropriate oversight agency(ies) shall retain a qualified archaeologist who shall conduct a field investigation of the specific site and shall assess the significance of the find by evaluating the resource for eligibility for listing on the CRHR and the NRHP. If the resource is eligible for listing on the CRHR or NRHP and it would be subject to disturbance or destruction, the actions required in Mitigation Measures 3A.5-1a and 3A.5-1b shall be implemented. The oversight agency shall be responsible for approval of recommended mitigation if it is determined to be feasible in light of the approved land uses, and shall implement the approved mitigation before resuming construction activities at the archaeological site. | | **Yes – See Cultural Resources Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, or Caltrans). | | | |
| **3A.5-3: Suspend Ground-Disturbing Activities if Human Remains are Encountered and Comply with California Health and Safety Code Procedures.** In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, including those associated with off-site elements, the project applicant(s) of all project phases shall immediately halt all ground-disturbing activities in the area of the find and notify the applicable county coroner and a professional archaeologist skilled in osteological analysis to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or public lands (California Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (California Health and Safety Code Section 7050[c]).<br><br>After the coroner's findings are complete, the project applicant(s), an archaeologist, and the NAHC-designated MLD shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting on notification of a discovery of Native American human remains are identified in Section 5097.9 of the California Public Resources Code.<br><br>Upon the discovery of Native American remains, the procedures above regarding involvement of the applicable county coroner, notification of the NAHC, and identification of an MLD shall be followed. The project applicant(s) of all project phases shall ensure that the immediate vicinity (according to generally accepted cultural or archaeological standards and practices) is not damaged or disturbed by further development activity until consultation with the MLD has taken place. The MLD shall have at least 48 hours after being granted access to the site to inspect the site and make recommendations. A range of possible treatments for the remains may be discussed: nondestructive removal and analysis, preservation in | | **Yes – See Cultural Resources Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| place, relinquishment of the remains and associated items to the descendants, or other culturally appropriate treatment. As suggested by Assembly Bill (AB) 2641 (Chapter 863, Statutes of 2006), the concerned parties may extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. AB 2641(e) includes a list of site protection measures and states that the project applicant(s) shall comply with one or more of the following requirements:<br><br>• record the site with the NAHC or the appropriate Information Center,<br>• use an open-space or conservation zoning designation or easement, or<br>• record a document with the county in which the property is located.<br><br>The project applicant(s) or its authorized representative of all project phases shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if the NAHC is unable to identify an MLD or if the MLD fails to make a recommendation within 48 hours after being granted access to the site. The project applicant(s) or its authorized representative may also reinter the remains in a location not subject to further disturbance if it rejects the recommendation of the MLD and mediation by the NAHC fails to provide measures acceptable to the landowner. Ground disturbance in the zone of suspended activity shall not recommence without authorization from the archaeologist.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, or Caltrans). | | | |
| **3A.7 Geology, Soils, Minerals, and Paleontological Resources - Land** | | | |
| **3A.7-1a: Prepare Site-Specific Geotechnical Report per CBC Requirements and Implement Appropriate Recommendations.** Before building permits are issued and construction activities begin any project development phase, the project applicant(s) of each project phase shall hire a licensed geotechnical engineer to prepare a final geotechnical subsurface investigation report for the on- and off-site facilities, which shall be submitted for review and approval to the appropriate City or county department (identified below). The final geotechnical engineering | | | **Yes – Discussed in the Introduction to Analysis Chapter.** |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| report shall address and make recommendations on the following:<br><br>• site preparation;<br>• soil bearing capacity;<br>• appropriate sources and types of fill;<br>• potential need for soil amendments;<br>• road, pavement, and parking areas;<br>• structural foundations, including retaining-wall design;<br>• grading practices;<br>• soil corrosion of concrete and steel;<br>• erosion/winterization;<br>• seismic ground shaking;<br>• liquefaction; and<br>• expansive/unstable soils.<br><br>In addition to the recommendations for the conditions listed above, the geotechnical investigation shall include subsurface testing of soil and groundwater conditions, and shall determine appropriate foundation designs that are consistent with the version of the CBC that is applicable at the time building and grading permits are applied for. All recommendations contained in the final geotechnical engineering report shall be implemented by the project applicant(s) of each project phase. Special recommendations contained in the geotechnical engineering report shall be noted on the grading plans and implemented as appropriate before construction begins. Design and construction of all new project development shall be in accordance with the CBC. The project applicant(s) shall provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the geotechnical report. | | | |
| **3A.7-1b: Monitor Earthwork during Earthmoving Activities.** All earthwork shall be monitored by a qualified geotechnical or soils engineer retained by the project applicant(s) of each project phase. The geotechnical or soils engineer shall provide oversight during all excavation, placement of fill, and disposal of materials removed from and deposited on both on- and off-site construction areas. | | **Yes – See Executive Summary Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, or Caltrans). | | | |
| **3A.7-3: Prepare and Implement the Appropriate Grading and Erosion Control Plan.** Before grading permits are issued, the project applicant(s) of each project phase that would be located within the City of Folsom shall retain a California Registered Civil Engineer to prepare a grading and erosion control plan. The grading and erosion control plan shall be submitted to the City Public Works Department before issuance of grading permits for all new development. The plan shall be consistent with the City's Grading Ordinance, the City's Hillside Development Guidelines, and the state's NPDES permit, and shall include the site-specific grading associated with development for all project phases.<br><br>For the two off-site roadways into El Dorado Hills, the project applicant(s) of that phase shall retain a California Registered Civil Engineer to prepare a grading and erosion control plan. The grading and erosion control plan shall be submitted to the El Dorado County Public Works Department and the El Dorado Hills Community Service District before issuance of grading permits for roadway construction in El Dorado Hills. The plan shall be consistent with El Dorado County's Grading, Erosion, and Sediment Control Ordinance and the state's NPDES permit, and shall include the site-specific grading associated with roadway development.<br><br>For the off-site detention basin west of Prairie City Road, the project applicant(s) of that phase shall retain a California Registered Civil Engineer to prepare a grading and erosion control plan. The grading and erosion control plan shall be submitted to the Sacramento County Public Works Department before issuance of a grading permit. The plan shall be consistent with Sacramento County's Grading, Erosion, and Sediment Control Ordinance and the state's NPDES permit, and shall include the site-specific grading associated with construction of the detention basin.<br><br>The plans referenced above shall include the location, implementation schedule, | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| and maintenance schedule of all erosion and sediment control measures, a description of measures designed to control dust and stabilize the construction-site road and entrance, and a description of the location and methods of storage and disposal of construction materials. Erosion and sediment control measures could include the use of detention basins, berms, swales, wattles, and silt fencing, and covering or watering of stockpiled soils to reduce wind erosion. Stabilization on steep slopes could include construction of retaining walls and reseeding with vegetation after construction. Stabilization of construction entrances to minimize trackout (control dust) is commonly achieved by installing filter fabric and crushed rock to a depth of approximately 1 foot. The project applicant(s) shall ensure that the construction contractor is responsible for securing a source of transportation and deposition of excavated materials.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties).<br><br>Implementation of Mitigation Measure 3A.9-1 (discussed in Section 3A.9, "Hydrology and Water Quality – Land") would also help reduce erosion-related impacts. | | | |
| **3A.7-4: Prepare a Seismic Refraction Survey and Obtain Appropriate Permits for all On-Site and Off-site Elements East of Old Placerville Road.** Before the start of all construction activities east of Old Placerville Road, the project applicant(s) for any discretionary development application shall retain a licensed geotechnical engineer to perform a seismic refraction survey. Project-related excavation activities shall be carried out as recommend by the geotechnical engineer. Excavation may include the use of heavy-duty equipment such as large bulldozers or large excavators, and may include blasting. Appropriate permits for blasting operations shall be obtained from the relevant City or county jurisdiction prior to the start of any blasting activities.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional | | **Yes - See Introduction to Analysis Chapter.** | |

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| boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties). | | | |
| **3A.7-5: Divert Seasonal Water Flows Away from Building Foundations.** The project applicant(s) of all project phases shall either install subdrains (which typically consist of perforated pipe and gravel, surrounded by nonwoven geotextile fabric), or take such other actions as recommended by the geotechnical or civil engineer for the project that would serve to divert seasonal flows caused by surface infiltration, water seepage, and perched water during the winter months away from building foundations. | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |
| **3A.7-9: Conduct Soil Sampling in Areas of the SPA Designated as MRZ-3 for Kaolin Clay and if Found, Delineate its Location and Notify Lead Agency and the California Division of Mines and Geology.** The project applicant(s) of all applicable project phases shall retain a licensed geotechnical or soils engineer to analyze soil core samples that shall be extracted from that portion of the SPA zoned MRZ-3 for kaolin clay, as shown on Exhibit 3A.7-3. In the event that kaolin clay is discovered, the City of Folsom, Sacramento County, and CDMG shall be notified. In addition, the approximate horizontal and vertical extent of available kaolin clay shall be delineated by the geotechnical or soils engineer. | **N/A – The project site is not identified as a site containing locally important mineral resources.** | | |
| **3A.7-10: Conduct Construction Personnel Education, Stop Work if Paleontological Resources are Discovered, Assess the Significance of the Find, and Prepare and Implement a Recovery Plan as Required.** To minimize potential adverse impacts on previously unknown potentially unique, scientifically important paleontological resources, the project applicant(s) of all project phases where construction would occur in the Ione and Mehrten Formations shall do the following:<br><br>• Before the start of any earthmoving activities for any project phase in the Ione or Mehrten Formations, the project applicant(s) shall retain a qualified paleontologist or archaeologist to train all construction personnel involved | | **Yes – See Cultural Resources Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| with earthmoving activities, including the site superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and proper notification procedures should fossils be encountered.<br>• If paleontological resources are discovered during earthmoving activities, the construction crew shall immediately cease work in the vicinity of the find and notify the appropriate lead agency (identified below). The project applicant(s) shall retain a qualified paleontologist to evaluate the resource and prepare a recovery plan in accordance with Society of Vertebrate Paleontology guidelines (1996). The recovery plan may include, but is not limited to, a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by the lead agency to be necessary and feasible shall be implemented before construction activities can resume at the site where the paleontological resources were discovered.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Sacramento County). | | | |
| **3B.7-1b: Incorporate Pipeline Failure Contingency Measures Into Final Pipeline Design.** Isolation valves or similar devices shall be incorporated into all pipeline facilities to prevent substantial losses of surface water in the event of pipeline rupture, as recommended by a licensed geotechnical or civil engineer. The specifications of the isolation valves shall conform to the CBC and American Water Works Association standards. | | **Yes - See Introduction to Analysis Chapter.** | |
| **3B.7-4: Implement Corrosion Protection Measures.** As determined appropriate by a licensed geotechnical or civil engineer, the City shall ensure that all underground metallic fittings, appurtenances, and piping include a cathodic | | **Yes - See Introduction to Analysis Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| protection system to protect these facilities from corrosion. | | | |
| **3B.7-5: Conduct Construction Personnel Education, Stop Work if Paleontological Resources are Discovered, Assess the Significance of the Find, and Prepare and Implement a Recovery Plan as Required.** To minimize potential adverse impacts on previously unknown potentially unique, scientifically important paleontological resources, the City shall implement appropriate measures during construction of the Offsite Water Facility improvements. These measures shall be required for construction activities at the following locations: (1) Grant Line Road, south of SR 16; (2) Florin road, east of Excelsior Road; (3) Gerber Road, east of Excelsior Road; (4) White Rock Road, east of Prairie City Road; and (5) Prairie City Road and shall include:<br><br>• Before the start of any earthmoving activities for any project phase in the Riverbank Formation, the project applicant(s) shall retain a qualified paleontologist or archaeologist to train all construction personnel involved with earthmoving activities, including the site superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and proper notification procedures should fossils be encountered.<br>• If paleontological resources are discovered during earthmoving activities, the construction crew shall immediately cease work in the vicinity of the find and notify Sacramento County Planning and Community Development Department. The project applicant(s) shall retain a qualified paleontologist to evaluate the resource and prepare a recovery plan in accordance with Society of Vertebrate Paleontology guidelines (1996). The recovery plan may include, but is not limited to, a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by the County to be necessary and feasible shall be implemented before construction activities can resume at the site where the paleontological resources were discovered. | | **Yes – See Cultural Resources Chapter.** | |
| **3A.8 Hazards and Hazardous Material - Land** | | | |
| **3A.8-2: Complete Investigations Related to the Extent to Which Soil and/or Groundwater May Have Been Contaminated in Areas Not Covered by the** | | | **Yes – ENGEO Inc.** ***Phase 1*** |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **Phase I and II Environmental Site Assessments and Implement Required Measures.** The project applicant(s) for any discretionary development application shall conduct Phase I Environmental Site Assessments (where an Phase I has not been conducted), and if necessary, Phase II Environmental Site Assessments, and/or other appropriate testing for all areas of the SPA and include, as necessary, analysis of soil and/or groundwater samples for the potential contamination sites that have not yet been covered by previous investigations (as shown in Exhibit 3A.8-1) before construction activities begin in those areas. Recommendations in the Phase I and II Environmental Site Assessments to address any contamination that is found shall be implemented before initiating ground-disturbing activities in these areas.<br><br>The project applicant(s) shall implement the following measures before ground-disturbing activities to reduce health hazards associated with potential exposure to hazardous substances:<br><br>• Prepare a plan that identifies any necessary remediation activities appropriate for proposed on- and off-site uses, including excavation and removal of on-site contaminated soils, redistribution of clean fill material in the SPA, and closure of any abandoned mine shafts. The plan shall include measures that ensure the safe transport, use, and disposal of contaminated soil and building debris removed from the site. In the event that contaminated groundwater is encountered during site excavation activities, the contractor shall report the contamination to the appropriate regulatory agencies, dewater the excavated area, and treat the contaminated groundwater to remove contaminants before discharge into the sanitary sewer system. The project applicant(s) shall be required to comply with the plan and applicable Federal, state, and local laws. The plan shall outline measures for specific handling and reporting procedures for hazardous materials and disposal of hazardous materials removed from the site at an appropriate off-site disposal facility.<br>• Notify the appropriate Federal, state, and local agencies if evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous groundwater) is encountered during construction activities. Any contaminated areas shall be remediated in accordance with recommendations made by the Sacramento County Environmental Management Department, | | | ***Environmental Site Assessment, Russell Ranch South Folsom, California*. May 7, 2013.** |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Central Valley RWQCB, DTSC, and/or other appropriate Federal, state, or local regulatory agencies.<br>• Obtain an assessment conducted by PG&E and SMUD pertaining to the contents of any existing pole-mounted transformers located in the SPA. The assessment shall determine whether existing on-site electrical transformers contain PCBs and whether there are any records of spills from such equipment. If equipment containing PCB is identified, the maintenance and/or disposal of the transformer shall be subject to the regulations of the Toxic Substances Control Act under the authority of the Sacramento County Environmental Health Department.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Sacramento County). | | | |
| **3A.8-3a: Require the Project Applicant(s) to Cooperate with Aerojet and Regulatory Agencies to Preserve, Modify, or Close Existing Groundwater Monitoring Wells.** The project applicant(s) for any particular discretionary development that would occur in or adjacent to the Area 40 boundary shall consult with Aerojet, EPA, DTSC, and/or the Central Valley RWQCB or any successor in interest to establish the preservation, modification, or closure of existing groundwater monitoring wells. If necessary, Aerojet, or any successor may purchase lots or obtain access agreements from the project applicant(s) to maintain access to monitoring wells and/or remediation systems. If groundwater wells are to be affected by proposed tentative maps, then the project applicant(s) or successors shall provide the City with evidence that the relocation, modification, or closure of the well(s) is approved by the appropriate agencies as part of the City's final map approval process and before development.<br><br>The project applicant(s) for activities related to the off-site detention basin located outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) with Sacramento County. | **N/A - The project site is not on or adjacent to Area 40 boundary.** | | |
| **3A.8-3b: Coordinate Development Activities to Avoid Interference with Remediation Activities.** The project applicant(s) for any particular discretionary development that would occur in or adjacent to the Area 40 boundary shall | **N/A - The project site is not on or adjacent to Area 40 boundary.** | | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| provide notice to Aerojet or any successor in interest and DTSC, the Central Valley RWQCB, and the City of Folsom of the location, nature, and duration of construction activities least 30 days before construction activities begin in areas on or near property with current or planned remediation activities (Area 40). Remedial actions, as required by DTSC, RWQCB, and/or the EPA, may include, but are not limited to:<br><br>• deed restrictions on land and groundwater use;<br>• requirements for building ventilation, heating, and air conditioning design;<br>• monitoring;<br>• installation of vertical barriers;<br>• biological, chemical, and/or physical treatment;<br>• extraction or excavation; and/or<br>• pump and treat activities.<br><br>Before the approval of grading plans which include areas within the Area 40 boundary or the off-site detention basin, the project applicant(s) shall consult with Aerojet, EPA, DTSC, and/or the Central Valley RWQCB or any successor to schedule the timing of construction activities to prevent potential conflicts with investigation and remediation activities.<br><br>The project applicant(s) for activities related to the off-site detention basin located outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) with Sacramento County. | | | |
| **3A.8-3c: Provide Written Notification to the City that, as required by EPA, DTSC, and the Central Valley RWQCB, -Required Notification Obligations and/or Easements Have Been Fulfilled to Ensure that Construction Activities Do Not Interfere with Remedial Actions.** Pursuant to their oversight over investigations of hazardous substances and determination of remedial action, EPA and/or DTSC establish, as appropriate, deed restrictions (e.g., restrictions on | **N/A - The project site is not on or adjacent to Area 40 boundary.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| future groundwater uses or future land uses) or easements (e.g., continued access to groundwater wells and pipelines) on property with associated notice requirements. The project applicant(s) for all such affected project activities, located within the Area 40 boundary, the off-site detention basin, or lands subject to monitoring or other remediation activities shall provide notification in writing to the City (or Sacramento County for the off-site detention basin) that said required notification obligations have been fulfilled. Evidence of the method of notification required by EPA and/or DTSC shall be submitted to the City before approval of tentative maps or improvement plans.<br><br>The project applicant(s) for such affected project activities shall coordinate with the City to include this provision as part of tentative map approval within the Area 40 boundary or lands subject to monitoring or other remediation activities. The project applicant(s) shall coordinate with Sacramento County for such affected project activities pertaining to the off-site detention basin.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Sacramento County).<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., Sacramento County). | | | |
| **3A.8-3d: Land Use Restrictions for Contaminated Soil and Groundwater within Area 40 as depicted on the Remedial Restrictions Area Exhibit 3A.8-9.** Prior to approval of any tentative maps, improvement plans, or discretionary project approvals for locations within Area 40, as depicted in the Remedial Restrictions Area (Exhibit 3A.8-9), the project applicant(s) shall designate those areas that are subject to off-gassing hazards in excess of an indoor air standard, as open space or park use, as required by the City and Aerojet in consultation with the EPA. Areas designated for open space or park under this mitigation measure shall be determined by the City and by Aerojet in consultation with the EPA using risk calculations (completed in accordance with EPA's 1989 *Risk Assessment Guidance for Superfund* [EPA/540/1-89-002] and DTSC's 1992 *Supplemental Guidance for Human Health Multimedia Risk Assessments of* | **N/A - The project site is not on or adjacent to Area 40 boundary.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| *Hazardous Waste Sites and Permitted Facilities* and 1994 *Preliminary Endangerment Assessment Guidance Manual*, or such guidance as may be in place at the time risk assessment is performed) for exposure to off-gassing from either soil or groundwater based on detected PCE and TCE concentrations. The project applicant(s) for such affected areas located within Area 40 as depicted on the Remedial Restrictions Area Exhibit 3A.8-9 shall implement this measure as part of tentative map applications or other discretionary project approvals when such applications are submitted to the City.<br><br>If the portions of Area 40 that are designated for park and open space use are not available for use as park and open space as identified in the SPA concurrently with surrounding development that creates demand for park and open space use, the project applicant(s), and the owners of land within the SPA shall identify and the City may rezone equivalent acreage of suitable park and open space land within the SPA for development as interim or permanent park and open space to meet the then current demand. | | | |
| **Mitigation Measure 3A.8-5: Prepare and Implement a Blasting Safety Plan in Consultation with a Qualified Blaster.** To reduce the potential for accidental injury or death related to blasting, contractors whose work on the SPA will include blasting shall prepare and implement a blasting safety plan. This plan shall be created in coordination with a qualified blaster, as defined by the Construction Safety and Health Outreach Program, Subpart U, Section 1926.901, and distributed to all appropriate members of construction teams. The plan shall apply to project applicant(s) of all project phases in which blasting would be employed. The plan shall include, but is not limited to:<br><br>• storage locations that meet ATF standards contained in 27 CFR Part 55;<br>• safety requirements for workers (e.g., daily safety meetings, personal protective equipment);<br>• an accident management plan that considers misfires (i.e. explosive fails to detonate), unexpected ignition, and flyrock; and<br>• measures to protect surrounding property (e.g., netting, announcement of dates of expected blasting, barricades, and audible and visual warnings). | **N/A – Development of the project site would not include blasting.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Upon completion of a blasting safety plan, the project applicant(s) contractor shall secure any required permits from the City of Folsom Fire Department and the El Dorado County Sheriff's Department for blasting activities in Sacramento County and El Dorado County, respectively.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado County). | | | |
| **P3A.8-6: Prudent Avoidance and Notification of EMF Exposure.** Potential purchasers of residential properties near the transmission lines shall be made aware of the controversy surrounding EMF exposure. The California Department of Real Estate shall be requested to insert an appropriate notification into the applicant's final Subdivision Public Report application, which shall be provided to purchasers of properties within 100 feet from the 100-115kV power line, or within 150 feet from the 220-230 kV power line. The notification would include a discussion of the scientific studies and conclusions reached to date, acknowledge that the notification distance is not based on specific biological evidence, but rather, the distance where background levels may increase, and provide that, given some uncertainty in the data, this notification is merely provided to allow purchasers to make an informed decision. | **N/A - Project Specific Analysis Concluded *Less than Significant.*** | | |
| **3A.8-7: Prepare and Implement a Vector Control Plan in Consultation with the Sacramento-Yolo Mosquito and Vector Control District.** To ensure that operation and design of the stormwater system, including multiple planned detention basins, is consistent with the recommendations of the Sacramento-Yolo Mosquito and Vector Control District regarding mosquito control, the project applicant(s) of all project phases shall prepare and implement a Vector Control Plan. This plan shall be prepared in coordination with the Sacramento-Yolo Mosquito and Vector Control District and shall be submitted to the City for approval before issuance of the grading permit for the detention basins under the City's jurisdiction. For the off-site detention basin, the plan shall be submitted to Sacramento County for approval before issuance of the grading permit for the off-site detention basin. The plan shall incorporate specific measures deemed sufficient by the City to minimize public health risks from mosquitoes, and as contained within the Sacramento-Yolo Mosquito and Vector Control District BMP Manual (Sacramento-Yolo Mosquito and Vector Control District 2008). The | | **Yes - See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| plan shall include, but is not limited to, the following components:<br><br>• Description of the project.<br>• Description of detention basins and all water features and facilities that would control on-site water levels.<br>• Goals of the plan.<br>• Description of the water management elements and features that would be implemented, including:<br>i. BMPs that would implemented on-site;<br>ii. public education and awareness;<br>iii. sanitary methods used (e.g., disposal of garbage);<br>iv. mosquito control methods used (e.g., fluctuating water levels, biological agents, pesticides, larvacides, circulating water); and<br>v. stormwater management (consistent with Stormwater Management Plan).<br>• Long-term maintenance of the detention basins and all related facilities (e.g., specific ongoing enforceable conditions or maintenance by a homeowner's association).<br><br>To reduce the potential for mosquitoes to reproduce in the detention basins, the project applicant(s) shall coordinate with the Sacramento-Yolo Mosquito and Vector Control District to identify and implement BMPs based on their potential effectiveness for SPA conditions. Potential BMPs could include, but are not limited to, the following:<br>i. build shoreline perimeters as steep and uniform as practicable to discourage dense plant growth;<br>ii. perform routine maintenance to reduce emergent plant densities to facilitate the ability of mosquito predators (i.e., fish) to move throughout vegetated area;<br>iii. design distribution piping and containment basins with adequate slopes to drain fully and prevent standing water. The design slope should take into consideration buildup of sediment between maintenance periods. Compaction during grading may also be needed to avoid slumping and settling; | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| iv. coordinate cleaning of catch basins, drop inlets, or storm drains with mosquito treatment operations;<br>v. enforce the prompt removal of silt screens installed during construction when no longer needed to protect water quality;<br>vi. if the sump, vault, or basin is sealed against mosquitoes, with the exception of the inlet and outlet, submerge the inlet and outlet completely to reduce the available surface area of water for mosquito egg–laying (female mosquitoes can fly through pipes); and<br>vii. design structures with the appropriate pumping, piping, valves, or other necessary equipment to allow for easy dewatering of the unit if necessary (Sacramento Yolo Mosquito and Vector Control District 2008).<br><br>The project applicant(s) of the project phase containing the off-site detention basin shall coordinate mitigation for the off-site with the affected oversight agency (i.e., Sacramento County). | | | |
| **3A.9 Hydrology and Water Quality - Land** | | | |
| **3A.9-1: Acquire Appropriate Regulatory Permits and Prepare and Implement SWPPP and BMPs.** Prior to the issuance of grading permits, the project applicant(s) of all projects disturbing one or more acres (including phased construction of smaller areas which are part of a larger project) shall obtain coverage under the SWRCB's NPDES stormwater permit for general construction activity (Order 2009-0009-DWQ), including preparation and submittal of a project-specific SWPPP at the time the NOI is filed. The project applicant(s) shall also prepare and submit any other necessary erosion and sediment control and engineering plans and specifications for pollution prevention and control to Sacramento County, City of Folsom, El Dorado County (for the off-site roadways into El Dorado Hills under the Proposed Project Alternative). The SWPPP and other appropriate plans shall identify and specify:<br><br>• the use of an effective combination of robust erosion and sediment control BMPs and construction techniques accepted by the local jurisdictions for use in the project area at the time of construction, that shall reduce the potential for runoff and the release, mobilization, and exposure of pollutants, | | **Yes - See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| including legacy sources of mercury from project-related construction sites. These may include but would not be limited to temporary erosion control and soil stabilization measures, sedimentation ponds, inlet protection, perforated riser pipes, check dams, and silt fences<br>• the implementation of approved local plans, non-stormwater management controls, permanent post-construction BMPs, and inspection and maintenance responsibilities;<br>• the pollutants that are likely to be used during construction that could be present in stormwater drainage and nonstormwater discharges, including fuels, lubricants, and other types of materials used for equipment operation;<br>• spill prevention and contingency measures, including measures to prevent or clean up spills of hazardous waste and of hazardous materials used for equipment operation, and emergency procedures for responding to spills;<br>• personnel training requirements and procedures that shall be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP; and<br>• the appropriate personnel responsible for supervisory duties related to implementation of the SWPPP.<br><br>Where applicable, BMPs identified in the SWPPP shall be in place throughout all site work and construction/demolition activities and shall be used in all subsequent site development activities. BMPs may include, but are not limited to, such measures as those listed below.<br><br>• Implementing temporary erosion and sediment control measures in disturbed areas to minimize discharge of sediment into nearby drainage conveyances, in compliance with state and local standards in effect at the time of construction. These measures may include silt fences, staked straw bales or wattles, sediment/silt basins and traps, geofabric, sandbag dikes, and temporary vegetation.<br>• Establishing permanent vegetative cover to reduce erosion in areas disturbed by construction by slowing runoff velocities, trapping sediment, and enhancing filtration and transpiration.<br>• Using drainage swales, ditches, and earth dikes to control erosion and runoff | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| by conveying surface runoff down sloping land, intercepting and diverting runoff to a watercourse or channel, preventing sheet flow over sloped surfaces, preventing runoff accumulation at the base of a grade, and avoiding flood damage along roadways and facility infrastructure.<br><br>A copy of the approved SWPPP shall be maintained and available at all times on the construction site.<br><br>For those areas that would be disturbed as part of the U.S. 50 interchange improvements, Caltrans shall coordinate with the development and implementation of the overall project SWPPP, or develop and implement its own SWPPP specific to the interchange improvements, to ensure that water quality degradation would be avoided or minimized to the maximum extent practicable.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties, or Caltrans). | | | |
| **3A.9-2: Prepare and Submit Final Drainage Plans and Implement Requirements Contained in Those Plans.** Before the approval of grading plans and building permits, the project applicant(s) of all project phases shall submit final drainage plans to the City, and to El Dorado County for the off-site roadway connections into El Dorado Hills, demonstrating that off-site upstream runoff would be appropriately conveyed through the SPA, and that project-related on-site runoff would be appropriately contained in detention basins or managed with through other improvements (e.g., source controls, biotechnical stream stabilization) to reduce flooding and hydromodfication impacts.<br><br>The plans shall include, but not be limited to, the following items:<br><br>• an accurate calculation of pre-project and post-project runoff scenarios, obtained using appropriate engineering methods, that accurately evaluates potential changes to runoff, including increased surface runoff;<br>• runoff calculations for the 10-year and 100-year (0.01 AEP) storm events | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| (and other, smaller storm events as required) shall be performed and the trunk drainage pipeline sizes confirmed based on alignments and detention facility locations finalized in the design phase;<br>• a description of the proposed maintenance program for the on-site drainage system;<br>• project-specific standards for installing drainage systems;<br>• City and El Dorado County flood control design requirements and measures designed to comply with them;<br><br>Implementation of stormwater management BMPs that avoid increases in the erosive force of flows beyond a specific range of conditions needed to limit hydromodification and maintain current stream geomorphology. These BMPs will be designed and constructed in accordance with the forthcoming SSQP Hydromodification Management Plan (to be adopted by the RWQCB) and may include, but are not limited to, the following:<br>i. use of Low Impact Development (LID) techniques to limit increases in stormwater runoff at the point of origination (these may include, but are not limited to: surface swales; replacement of conventional impervious surfaces with pervious surfaces [e.g., porous pavement]; impervious surfaces disconnection; and trees planted to intercept stormwater);<br>ii. enlarged detention basins to minimize flow changes and changes to flow duration characteristics;<br>iii. bioengineered stream stabilization to minimize bank erosion, utilizing vegetative and rock stabilization, and inset floodplain restoration features that provide for enhancement of riparian habitat and maintenance of natural hydrologic and channel to floodplain interactions;<br>iv. minimize slope differences between any stormwater or detention facility outfall channel with the existing receiving channel gradient to reduce flow velocity; and<br>v. minimize to the extent possible detention basin, bridge embankment, and other encroachments into the channel and floodplain corridor, and utilize open bottom box culverts to allow sediment passage on smaller | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| drainage courses.<br><br>The final drainage plan shall demonstrate to the satisfaction of the City of Folsom Community Development and Public Works Departments and El Dorado County Department of Transportation that 100-year (0.01 AEP) flood flows would be appropriately channeled and contained, such that the risk to people or damage to structures within or down gradient of the SPA would not occur, and that hydromodification would not be increased from pre-development levels such that existing stream geomorphology would be changed (the range of conditions should be calculated for each receiving water if feasible, or a conservative estimate should be used, e.g., an Ep of 1 ±10% or other as approved by the Sacramento Stormwater Quality Partnership and/or City of Folsom Public Works Department).<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with El Dorado County. | | | |
| **3A.9-3: Develop and Implement a BMP and Water Quality Maintenance Plan.** Before approval of the grading permits for any development project requiring a subdivision map, a detailed BMP and water quality maintenance plan shall be prepared by a qualified engineer retained by the project applicant(s) the development project. Drafts of the plan shall be submitted to the City of Folsom and El Dorado County for the off-site roadway connections into El Dorado Hills, for review and approval concurrently with development of tentative subdivision maps for all project phases. The plan shall finalize the water quality improvements and further detail the structural and nonstructural BMPs proposed for the project. The plan shall include the elements described below.<br><br>• A quantitative hydrologic and water quality analysis of proposed conditions incorporating the proposed drainage design features.<br>• Predevelopment and postdevelopment calculations demonstrating that the proposed water quality BMPs meet or exceed requirements established by the City of Folsom and including details regarding the size, geometry, and functional timing of storage and release pursuant to the '"Stormwater | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Quality Design Manual for Sacramento and South Placer Regions" ([SSQP 2007b] per NPDES Permit No. CAS082597 WDR Order No. R5-2008-0142, page 46) and El Dorado County's NPDES SWMP (County of El Dorado 2004).<br>• Source control programs to control water quality pollutants on the SPA, which may include but are limited to recycling, street sweeping, storm drain cleaning, household hazardous waste collection, waste minimization, prevention of spills and illegal dumping, and effective management of public trash collection areas.<br>• A pond management component for the proposed basins that shall include management and maintenance requirements for the design features and BMPs, and responsible parties for maintenance and funding.<br>• LID control measures shall be integrated into the BMP and water quality maintenance plan. These may include, but are not limited to:<br>i. surface swales;<br>ii. replacement of conventional impervious surfaces with pervious surfaces (e.g., porous pavement);<br>iii. impervious surfaces disconnection; and<br>iv. trees planted to intercept stormwater.<br><br>New stormwater facilities shall be placed along the natural drainage courses within the SPA to the extent practicable so as to mimic the natural drainage patterns. The reduction in runoff as a result of the LID configurations shall be quantified based on the runoff reduction credit system methodology described in "Stormwater Quality Design Manual for the Sacramento and South Placer Regions, Chapter 5 and Appendix D4" (SSQP 2007b) and proposed detention basins and other water quality BMPs shall be sized to handle these runoff volumes.<br><br>For those areas that would be disturbed as part of the U.S. 50 interchange improvements, it is anticipated that Caltrans would coordinate with the development and implementation of the overall project SWPPP, or develop and implement its own SWPPP specific to the interchange improvements, to ensure that water quality degradation would be avoided or minimized to the maximum | | | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| extent practicable.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with El Dorado County and Caltrans. | | | |
| **3A.9-4: Inspect and Evaluate Existing Dams Within and Upstream of the Project Site and Make Improvements if Necessary.** Prior to submittal to the City of tentative maps or improvement plans the project applicant(s) of all project phases shall perform conduct studies to determine the extent of inundation in the case of dam failure. If the studies determine potential exposure of people or structures to a significant risk of flooding as a result of the failure of a dam, the applicants(s) shall implement of any feasible recommendations provided in that study, potentially through drainage improvements, subject to the approval of the City of Folsom Public Works Department. | | **Yes – See Executive Summary Chapter.** | |
| **3A.11 Noise - Land** | | | |
| **3A.11-1: Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise near Sensitive Receptors.** To reduce impacts associated with noise generated during project- related construction activities, the project applicant(s) and their primary contractors for engineering design and construction of all project phases shall ensure that the following requirements are implemented at each work site in any year of project construction to avoid and minimize construction noise effects on sensitive receptors. The project applicant(s) and primary construction contractor(s) shall employ noise-reducing construction practices. Measures that shall be used to limit noise shall include the measures listed below:<br><br>• Noise-generating construction operations shall be limited to the hours between 7 a.m. and 7 p.m. Monday through Friday, and between 8 a.m. and 6 p.m. on Saturdays and Sundays.<br>• All construction equipment and equipment staging areas shall be located as far as possible from nearby noise-sensitive land uses.<br>• All construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in | | **Yes – See Noise Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.<br>• All motorized construction equipment shall be shut down when not in use to prevent idling.<br>• Individual operations and techniques shall be replaced with quieter procedures (e.g., using welding instead of riveting, mixing concrete off- site instead of on-site).<br>• Noise-reducing enclosures shall be used around stationary noise-generating equipment (e.g., compressors and generators) as planned phases are built out and future noise sensitive receptors are located within close proximity to future construction activities.<br>• Written notification of construction activities shall be provided to all noise-sensitive receptors located within 850 feet of construction activities. Notification shall include anticipated dates and hours during which construction activities are anticipated to occur and contact information, including a daytime telephone number, for the project representative to be contacted in the event that noise levels are deemed excessive. Recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors) shall also be included in the notification.<br>• To the extent feasible, acoustic barriers (e.g., lead curtains, sound barriers) shall be constructed to reduce construction-generated noise levels at affected noise-sensitive land uses. The barriers shall be designed to obstruct the line of sight between the noise-sensitive land use and on-site construction equipment. When installed properly, acoustic barriers can reduce construction noise levels by approximately 8–10 dB (EPA 1971).<br>• When future noise sensitive uses are within close proximity to prolonged construction noise, noise-attenuating buffers such as structures, truck trailers, or soil piles shall be located between noise sources and future residences to shield sensitive receptors from construction noise.<br>• The primary contractor shall prepare and implement a construction noise management plan. This plan shall identify specific measures to ensure compliance with the noise control measures specified above. The noise control plan shall be submitted to the City of Folsom before any noise- | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| generating construction activity begins. Construction shall not commence until the construction noise management plan is approved by the City of Folsom. Mitigation for the two off-site roadway connections into El Dorado County must be coordinated by the project applicant(s) of the applicable project phase with El Dorado County, since the roadway extensions are outside of the City of Folsom's jurisdictional boundaries. | | | |
| **3A.11-3: Implement Measures to Prevent Exposure of Sensitive Receptors to Groundborne Noise or Vibration from Project Generated Construction Activities.**<br><br>• To the extent feasible, blasting activities shall not be conducted within 275 feet of existing or future sensitive receptors.<br>• To the extent feasible, bulldozing activities shall not be conducted within 50 feet of existing or future sensitive receptors.<br>• All blasting shall be performed by a blast contractor and blasting personnel licensed to operate in the State of California.<br>• A blasting plan, including estimates of vibration levels at the residence closest to the blast, shall be submitted to the enforcement agency for review and approval prior to the commencement of the first blast.<br>• Each blast shall be monitored and documented for groundbourne noise and vibration levels at the nearest sensitive land use and associated recorded submitted to the enforcement agency. | **N/A - Project Specific Analysis Concluded *Less than Significant.*** | | |
| **3A.11-4: Implement Measures to Prevent Exposure of Sensitive Receptors to Increases in Noise from Project- Generated Operational Traffic on Off-site and On-Site Roadways.** To meet applicable noise standards as set forth in the appropriate General Plan or Code (e.g., City of Folsom, County of Sacramento, and County of El Dorado) and to reduce increases in traffic-generated noise levels at noise-sensitive uses, the project applicant(s) of all project phases shall implement the following:<br><br>• Obtain the services of a consultant (such as a licensed engineer or licensed architect) to develop noise-attenuation measures for the proposed construction of on-site noise-sensitive land uses (i.e., residential dwellings and school classrooms) that will produce a minimum composite Sound | | | **Yes – j.c. brennan & associates, Inc. *Environmental Noise Analysis, Russell Ranch.* October 29, 2014.** |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Transmission Class (STC) rating for buildings of 30 or greater, individually computed for the walls and the floor/ceiling construction of buildings, for the proposed construction of on-site noise-sensitive land uses (i.e., residential dwellings and school classrooms).<br>• Prior to submittal of tentative subdivision maps and improvement plans, the project applicant(s) shall conduct a site-specific acoustical analysis to determine predicted roadway noise impacts attributable to the project, taking into account site-specific conditions (e.g., site design, location of structures, building characteristics). The acoustical analysis shall evaluate stationary- and mobile-source noise attributable to the proposed use or uses and impacts on nearby noise-sensitive land uses, in accordance with adopted City noise standards. Feasible measures shall be identified to reduce project-related noise impacts. These measures may include, but are not limited to, the following:<br>i. limiting noise-generating operational activities associated with proposed commercial land uses, including truck deliveries;<br>ii. constructing exterior sound walls;<br>iii. constructing barrier walls and/or berms with vegetation;<br>iv. using "quiet pavement" (e.g., rubberized asphalt) construction methods on local roadways; and,<br>v. using increased noise-attenuation measures in building construction (e.g., dual-pane, sound-rated windows; exterior wall insulation). | | | |
| **3A.11-5: Implement Measures to Reduce Noise from Project-Generated Stationary Sources.** The project applicant(s) for any particular discretionary development project shall implement the following measures to reduce the effect of noise levels generated by on-site stationary noise sources that would be located within 600 feet of any noise-sensitive receptor:<br><br>• Routine testing and preventive maintenance of emergency electrical generators shall be conducted during the less sensitive daytime hours (i.e., 7:00 a.m. to 6:00 p.m.). All electrical generators shall be equipped with noise control (e.g., muffler) devices in accordance with manufacturers' specifications.<br>• External mechanical equipment associated with buildings shall incorporate | **N/A - Project Specific Analysis Concluded *Less than Significant.*** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| features designed to reduce noise emissions below the stationary noise source criteria. These features may include, but are not limited to, locating generators within equipment rooms or enclosures that incorporate noise-reduction features, such as acoustical louvers, and exhaust and intake silencers. Equipment enclosures shall be oriented so that major openings (i.e., intake louvers, exhaust) are directed away from nearby noise-sensitive receptors.<br>• Parking lots shall be located and designed so that noise emissions do not exceed the stationary noise source criteria established in this analysis (i.e., 50 dB for 30 minutes in every hour during the daytime [7 a.m. to 10 p.m.] and less than 45 dB for 30 minutes of every hour during the night time [10 p.m. to 7 a.m.]). Reduction of parking lot noise can be achieved by locating parking lots as far away as feasible from noise sensitive land uses, or using buildings and topographic features to provide acoustic shielding for noise-sensitive land uses.<br>• Loading docks shall be located and designed so that noise emissions do not exceed the stationary noise source criteria established in this analysis (i.e., 50 dB for 30 minutes in every hour during the daytime [7 a.m. to 10 p.m.] and less than 45 dB for 30 minutes of every hour during the night time [10 p.m. to 7 a.m.]). Reduction of loading dock noise can be achieved by locating loading docks as far away as possible from noise sensitive land uses, constructing noise barriers between loading docks and noise-sensitive land uses, or using buildings and topographic features to provide acoustic shielding for noise-sensitive land uses. | | | |
| **3A.14 Public Services - Land** | | | |
| **3A.14-1: Prepare and Implement a Construction Traffic Control Plan.** The project applicant(s) of all project phases shall prepare and implement traffic control plans for construction activities that may affect road rights-of-way. The traffic control plans must follow any applicable standards of the agency responsible for the affected roadway and must be approved and signed by a professional engineer. Measures typically used in traffic control plans include advertising of planned lane closures, warning signage, a flagperson to direct traffic flows when needed, and methods to ensure continued access by emergency vehicles. During project construction, access to existing land uses shall be | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| maintained at all times, with detours used as necessary during road closures. Traffic control plans shall be submitted to the appropriate City or County department or the California Department of Transportation (Caltrans) for review and approval before the approval of all project plans or permits, for all project phases where implementation may cause impacts on traffic.<br><br>Mitigation for the off-site elements outside of the City of Folsom's jurisdictional boundaries must be coordinated by the project applicant(s) of each applicable project phase with the affected oversight agency(ies) (i.e., El Dorado and/or Sacramento Counties and Caltrans). | | | |
| **3A.14-2: Incorporate California Fire Code; City of Folsom Fire Code Requirements; and EDHFD Requirements, if Necessary, into Project Design and Submit Project Design to the City of Folsom Fire Department for Review and Approval.** To reduce impacts related to the provision of new fire services, the project applicant(s) of all project phases shall do the following, as described below.<br>1. Incorporate into project designs fire flow requirements based on the California Fire Code, Folsom Fire Code (City of Folsom Municipal Code Title 8, Chapter 8.36), and other applicable requirements based on the City of Folsom Fire Department fire prevention standards. Improvement plans showing the incorporation automatic sprinkler systems, the availability of adequate fire flow, and the locations of hydrants shall be submitted to the City of Folsom Fire Department for review and approval. In addition, approved plans showing access design shall be provided to the City of Folsom Fire Department as described by Zoning Code Section 17.57.080 ("Vehicular Access Requirements"). These plans shall describe access-road length, dimensions, and finished surfaces for firefighting equipment. The installation of security gates across a fire apparatus access road shall be approved by the City of Folsom Fire Department. The design and operation of gates and barricades shall be in accordance with the Sacramento County Emergency Access Gates and Barriers Standard, as required by the City of Folsom Fire Code.<br>2. Submit a Fire Systems New Buildings, Additions, and Alterations Document Submittal List to the City of Folsom Community Development Department Building Division for review and approval before the issuance of building | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| permits.<br><br>In addition to the above measures, the project applicant(s) of all project phases shall incorporate the provisions described below for the portion of the SPA within the EDHFD service area, if it is determined through City/El Dorado County negotiations that EDHFD would serve the 178-acre portion of the SPA.<br><br>3. Incorporate into project designs applicable requirements based on the EDHFD fire prevention standards. For commercial development, improvement plans showing roadways, land splits, buildings, fire sprinkler systems, fire alarm systems, and other commercial building improvements shall be submitted to the EDHFD for review and approval. For residential development, improvement plans showing property lines and adjacent streets or roads; total acreage or square footage of the parcel; the footprint of all structures; driveway plan views describing width, length, turnouts, turnarounds, radiuses, and surfaces; and driveway profile views showing the percent grade from the access road to the structure and vertical clearance shall be submitted to the EDHFD for review and approval.<br>4. Submit a Fire Prevention Plan Checklist to the EDHFD for review and approval before the issuance of building permits. In addition, residential development requiring automation fire sprinklers shall submit sprinkler design sheet(s) and hydraulic calculations from a California State Licensed C-16 Contractor.<br><br>The City shall not authorize the occupancy of any structures until the project applicant(s) have obtained a Certificate of Occupancy from the City of Folsom Community Development Department verifying that all fire prevention items have been addressed on-site to the satisfaction of the City of Folsom Fire Department and/or the EDHFD for the 178-acre area of the SPA within the EDHFD service area.<br><br>[NOTE: The project is not located within the EDHFD] | | | |
| **3A.14-3: Incorporate Fire Flow Requirements into Project Designs.** The project applicant(s) of all project phases shall incorporate into their project designs fire flow requirements based on the California Fire Code, Folsom Fire | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Code, and/or EDHFD for those areas of the SPA within the EDHFD service area and shall verify to City of Folsom Fire Department that adequate water flow is available, prior to approval of improvement plans and issuance of occupancy permits or final inspections for all project phases. | | | |
| **3A.15 Traffic and Transportation - Land** | | | |
| **3A.15-1a: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the Folsom Boulevard/Blue Ravine Road Intersection (Intersection 1).** To ensure that the Folsom Boulevard/Blue Ravine Road intersection operates at an acceptable LOS, the eastbound approach must be reconfigured to consist of two left-turn lanes, one through lane, and one right-turn lane. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the Folsom Boulevard/Blue Ravine Road intersection (Intersection 1). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1b: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements at the Sibley Street/ Blue Ravine Road Intersection (Intersection 2).** To ensure that the Sibley Street/Blue Ravine Road intersection operates at an acceptable LOS, the northbound approach must be reconfigured to consist of two left-turn lanes, two through lanes, and one right-turn lane. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the Sibley Street/Blue Ravine Road intersection (Intersection 2). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1c: The Applicant Shall Fund and Construct Improvements to the Scott Road (West)/White Rock Road Intersection (Intersection 28).** To ensure that the Scott Road (West)/White Rock Road intersection operates at an acceptable LOS, a traffic signal must be installed. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1e: Fund and Construct Improvements to the Hillside Drive/Easton Valley Parkway Intersection (Intersection 41).** To ensure that the Hillside Drive/Easton Valley Parkway intersection operates at an acceptable LOS, the eastbound approach must be reconfigured to consist of one dedicated left turn lane and two through lanes, and the westbound approach must be reconfigured to consist of two through lanes and one dedicated right-turn lane. The applicant shall fund and construct these improvements. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.15-1f: Fund and Construct Improvements to the Oak Avenue Parkway/Middle Road Intersection (Intersection 44).** To ensure that the Oak Avenue Parkway/Middle Road intersection operates at an acceptable LOS, control all movements with a stop sign. The applicant shall fund and construct these improvements. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1h: Participate in Fair Share Funding of Improvements to Reduce Impacts to the Hazel Avenue/Folsom Boulevard Intersection (Sacramento County Intersection 2).** To ensure that the Hazel Avenue/Folsom Boulevard intersection operates at an acceptable LOS, this intersection must be grade separated including "jug handle" ramps. No at grade improvement is feasible. Grade separating and extended (south) Hazel Avenue with improvements to the U.S. 50/Hazel Avenue interchange is a mitigation measure for the approved Easton-Glenbrough Specific Plan development project. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the Hazel Avenue/Folsom Boulevard intersection (Sacramento County Intersection 2). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1i: Participate in Fair Share Funding of Improvements to Reduce Impacts on the Grant Line Road/White Rock Road Intersection and to White Rock Road widening between the Rancho Cordova City limit to Prairie City Road (Sacramento County Intersection 3).** Improvements must be made to ensure that the Grant Line Road/White Rock Road intersection operates at an acceptable LOS. The currently County proposed White Rock Road widening project will widen and realign White Rock Road from the Rancho Cordova City limit to the El Dorado County line (this analysis assumes that the Proposed Project and build alternatives will widen White Rock Road to five lanes from Prairie City road to the El Dorado County Line). This widening includes improvements to the Grant Line Road intersection and realigning White Rock Road to be the through movement. The improvements include two eastbound through lanes, one eastbound right turn lane, two northbound left turn lanes, two northbound right turn lanes, two westbound left turn lanes and two westbound through lanes. This improvement also includes the signalization of the White Rock Road and Grant Line Road intersection. With implementation of this improvement, the intersection would operate at an acceptable LOS A. The applicant shall pay its proportionate share of funding of improvements to the | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| agency responsible for improvements, based on a program established by that agency to reduce the impacts to the Grant Line Road/White Rock Road intersection (Sacramento County Intersection 3). | | | |
| **3A.15-1j: Participate in Fair Share Funding of Improvements to Reduce Impacts on Hazel Avenue between Madison Avenue and Curragh Downs Drive (Roadway Segment 10).** To ensure that Hazel Avenue operates at an acceptable LOS between Curragh Downs Drive and Gold Country Boulevard, Hazel Avenue must be widened to six lanes. This improvement is part of the County adopted Hazel Avenue widening project. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1l: Participate in Fair Share Funding of Improvements to Reduce Impacts on the White Rock Road/Windfield Way Intersection (El Dorado County Intersection 3).** To ensure that the White Rock Road/Windfield Way intersection operates at an acceptable LOS, the intersection must be signalized and separate northbound left and right turn lanes must be striped. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the White Rock Road/Windfield Way intersection (El Dorado County Intersection 3). | | **Yes - See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1o: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound U.S. 50 as an alternative to improvements at the Folsom Boulevard/U.S. 50 Eastbound Ramps Intersection (Caltrans Intersection 4).** Congestion on eastbound U.S. 50 is causing vehicles to use Folsom Boulevard as an alternate parallel route until they reach U.S. 50, where they must get back on the freeway due to the lack of a parallel route. It is preferred to alleviate the congestion on U.S. 50 than to upgrade the intersection at the end of this reliever route. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the Folsom Boulevard/U.S. 50 Eastbound Ramps intersection (Caltrans Intersection 4).<br><br>To ensure that the Folsom Boulevard/U.S. 50 eastbound ramps intersection operates at an acceptable LOS, auxiliary lanes should be added to eastbound U.S. 50 from Hazel Avenue to east of Folsom Boulevard. This was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.15-1p: Participate in Fair Share Funding of Improvements to Reduce Impacts on the Grant Line Road/ State Route 16 Intersection (Caltrans Intersection 12).** To ensure that the Grant Line Road/State Route 16 intersection operates at an acceptable LOS, the northbound and southbound approaches must be reconfigured to consist of one left-turn lane and one shared through/right-turn lane. Protected left-turn signal phasing must be provided on the northbound and southbound approaches. Improvements to the Grant Line Road/State Route 16 intersection are contained within the County Development Fee Program, and are scheduled for Measure A funding.<br><br>• Improvements to this intersection must be implemented by Caltrans, Sacramento County, and the City of Rancho Cordova.<br><br>The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the Grant Line Road/State Route 16 intersection (Caltrans Intersection 12). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1q: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound U.S. 50 between Zinfandel Drive and Sunrise Boulevard (Freeway Segment 1).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS between Zinfandel Drive and Sunrise Boulevard, a bus-carpool (HOV) lane must be constructed. This improvement is currently planned as part of the Sacramento 50 Bus-Carpool Lane and Community Enhancements Project. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Eastbound U.S. 50 between Zinfandel Drive and Sunrise Boulevard (Freeway Segment 1). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1r: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound U.S. 50 between Hazel Avenue and Folsom Boulevard (Freeway Segment 3).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS between Hazel Avenue and Folsom Boulevard, an auxiliary lane must be constructed. This improvement was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project. This improvement is included in the proposed 50 Corridor Mobility Fee Program. The | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Eastbound U.S. 50 between Hazel Avenue and Folsom Boulevard (Freeway Segment 3). | | | |
| **3A.15-1s: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound U.S. 50 between Folsom Boulevard and Prairie City Road (Freeway Segment 4).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS between Folsom Boulevard and Prairie City Road, an auxiliary lane must be constructed. This improvement was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project. This improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to Eastbound U.S. 50 between Folsom Boulevard and Prairie City Road (Freeway Segment 4). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1u: Participate in Fair Share Funding of Improvements to Reduce Impacts on Westbound U.S. 50 between Prairie City Road and Folsom Boulevard (Freeway Segment 16).** To ensure that Westbound U.S. 50 operates at an acceptable LOS between Prairie City Road and Folsom Boulevard, an auxiliary lane must be constructed. This improvement was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project. This improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to Westbound U.S. 50 between Prairie City Road and Folsom Boulevard (Freeway Segment 16). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1v: Participate in Fair Share Funding of Improvements to Reduce Impacts on Westbound U.S. 50 between Hazel Avenue and Sunrise Boulevard (Freeway Segment 18).** To ensure that Westbound U.S. 50 operates at an acceptable LOS between Hazel Avenue and Sunrise Boulevard, an auxiliary lane must be constructed. This improvement was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project, and included in the proposed Rancho Cordova Parkway interchange project. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Westbound U.S. 50 between Hazel Avenue and Sunrise Boulevard (Freeway Segment 18). | | | |
| **3A.15-1w: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound/Folsom Boulevard Ramp Merge (Freeway Merge 4).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS at the Folsom Boulevard merge, an auxiliary lane from the Folsom Boulevard merge to the Prairie City Road diverge must be constructed. This improvement was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project. This improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the U.S. 50 Eastbound/Folsom Boulevard Ramp Merge (Freeway Merge 4). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1x: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound/Prairie City Road Diverge (Freeway Diverge 5).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS at the Prairie City Road off-ramp diverge, an auxiliary lane from the Folsom Boulevard merge must be constructed. This improvement was recommended in the Traffic Operations Analysis Report for the U.S. 50 Auxiliary Lane Project. This auxiliary lane improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound/Prairie City Road diverge (Freeway Diverge 5). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1y: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound/Prairie City Road Direct Merge (Freeway Merge 6).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS at the Prairie City Road on-ramp direct merge, an auxiliary lane to the East Bidwell Street – Scott Road diverge must be constructed. This auxiliary lane improvement included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound/Prairie City Road direct merge (Freeway Merge 6). | | | |
| **3A.15-1z: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound/Prairie City Road Flyover On-Ramp to Oak Avenue Parkway Off-Ramp Weave (Freeway Weave 8).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS at the Prairie City Road flyover on-ramp to Oak Avenue Parkway off-ramp weave, an improvement acceptable to Caltrans should be implemented to eliminate the unacceptable weaving conditions. Such an improvement may involve a "braided ramp". The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound / Prairie City Road flyover on-ramp to Oak Avenue Parkway off-ramp weave (Freeway Weave 8). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1aa: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound/Oak Avenue Parkway Loop Merge (Freeway Merge 9).** To ensure that Eastbound U.S. 50 operates at an acceptable LOS at the Oak Avenue Parkway loop merge, an auxiliary lane to the East Bidwell Street – Scott Road diverge must be constructed. This auxiliary lane improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound/ Oak Avenue Parkway loop merge (Freeway Merge 9). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1dd: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound/Empire Ranch Road Loop Ramp Merge (Freeway Merge 23).** To ensure that Westbound U.S. 50 operates at an acceptable LOS, the northbound Empire Ranch Road loop on ramp should start the westbound auxiliary lane that ends at the East Bidwell Street – Scott Road off ramp. The slip on ramp from southbound Empire Ranch Road would merge into this extended auxiliary lane. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Westbound/Empire Ranch Road loop ramp merge (Freeway Merge 23). | | | |
| **3A.15-1ee: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound/Oak Avenue Parkway Loop Ramp Merge (Freeway Merge 29).** To ensure that Westbound U.S. 50 operates at an acceptable LOS, the northbound Oak Avenue Parkway loop on ramp should start the westbound auxiliary lane that ends at the Prairie City Road off ramp. The slip on ramp from southbound Oak Avenue Parkway would merge into this extended auxiliary lane. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Westbound/Oak Avenue Parkway loop ramp merge (Freeway Merge 29). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1ff: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound/Prairie City Road Loop Ramp Merge (Freeway Merge 32).** To ensure that Westbound U.S. 50 operates at an acceptable LOS at the Prairie City Road loop ramp merge, an auxiliary lane to the Folsom Boulevard off ramp diverge must be constructed. This auxiliary lane improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Westbound/Prairie City Road Loop Ramp Merge (Freeway Merge 32). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1gg: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound/Prairie City Road Direct Ramp Merge (Freeway Merge 33).** To ensure that Westbound U.S. 50 operates at an acceptable LOS at the Prairie City Road direct ramp merge, an auxiliary lane to the Folsom Boulevard off ramp diverge must be constructed. This auxiliary lane improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

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| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Westbound/Prairie City Road direct ramp merge (Freeway Merge 33). | | | |
| **3A.15-1hh: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound/Folsom Boulevard Diverge (Freeway Diverge 34).** To ensure that Westbound U.S. 50 operates at an acceptable LOS at the Folsom Boulevard Diverge, an auxiliary lane from the Prairie City Road loop ramp merge must be constructed. Improvements to this freeway segment must be implemented by Caltrans. This auxiliary lane improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound / Folsom Boulevard diverge (Freeway Diverge 34). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-1ii: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound/Hazel Avenue Direct Ramp Merge (Freeway Merge 38).** To ensure that Westbound U.S. 50 operates at an acceptable LOS at the Hazel Avenue direct ramp merge, an auxiliary lane to the Sunrise Boulevard off ramp diverge must be constructed. This auxiliary lane improvement is included in the proposed 50 Corridor Mobility Fee Program. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the U.S. 50 Westbound/Hazel Avenue direct ramp merge (Freeway Merge 38). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-2a: Develop Commercial Support Services and Mixed-use Development Concurrent with Housing Development, and Develop and Provide Options for Alternative Transportation Modes.** The project applicant(s) for any particular discretionary development application including commercial or mixed-use development along with residential uses shall develop commercial and mixed-use development concurrent with housing development, | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| to the extent feasible in light of market realities and other considerations, to internalize vehicle trips. Pedestrian and bicycle facilities shall be implemented to the satisfaction of the City Public Works Department. To further minimize impacts from the increased demand on area roadways and intersections, the project applicant(s) for any particular discretionary development application involving schools or commercial centers shall develop and implement safe and secure bicycle parking to promote alternative transportation uses and reduce the volume of single-occupancy vehicles using area roadways and intersections.<br><br>The project applicant(s) for any particular discretionary development application shall participate in capital improvements and operating funds for transit service to increase the percent of travel by transit. The project's fair-share participation and the associated timing of the improvements and service shall be identified in the project conditions of approval and/or the project's development agreement. Improvements and service shall be coordinated, as necessary, with Folsom Stage Lines and Sacramento RT. | | | |
| **3A.15-2b: Participate in the City's Transportation System Management Fee Program.** The project applicant(s) for any particular discretionary development application shall pay an appropriate amount into the City's existing Transportation System Management Fee Program to reduce the number of single-occupant automobile travel on area roadways and intersections. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-2c: Participate with the 50 Corridor Transportation Management Association.** The project applicant(s) for any particular discretionary development application shall join and participate with the 50 Corridor Transportation Management Association to reduce the number of single-occupant automobile travel on area roadways and intersections. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-3: Pay Full Cost of Identified Improvements that Are Not Funded by the Citys Fee Program.** In accordance with Measure W, the project applicant(s) for any particular discretionary development application shall provide fair-share contributions to the City's transportation impact fee program to fully fund | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| improvements only required because of the Specific Plan. | | | |
| **3A.15-4a: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the Sibley Street/Blue Ravine Road Intersection (Folsom Intersection 2).** To ensure that the Sibley Street/Blue Ravine Road intersection operates at a LOS D with less than the Cumulative No Project delay, the northbound approach must be reconfigured to consist of two left-turn lane, two through lanes, and one dedicated right-turn lane. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the Sibley Street/Blue Ravine Road intersection (Folsom Intersection 2). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4b: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the Oak Avenue Parkway/East Bidwell Street Intersection (Folsom Intersection 6).** To ensure that the Oak Avenue Parkway/East Bidwell Street intersection operates at an acceptable LOS, the eastbound (East Bidwell Street) approach must be reconfigured to consist of two left-turn lanes, four through lanes and a right-turn lane, and the westbound (East Bidwell Street) approach must be reconfigured to consist of two left- turn lanes, four through lanes, and a right-turn lane. It is against the City of Folsom policy to have eight lane roads because of the impacts to non-motorized traffic and adjacent development; therefore, this improvement is infeasible. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4c: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the East Bidwell Street/College Street Intersection (Folsom Intersection 7).** To ensure that the East Bidwell Street/College Street intersection operates at acceptable LOS C or better, the westbound approach must be reconfigured to consist of one left-turn lane, one left-through lane, and two dedicated right-turn lanes. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the East Bidwell Street/Nesmith Court intersection (Folsom Intersection 7). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4d: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the East Bidwell Street/Iron Point Road Intersection (Folsom Intersection 21).** To ensure that the East Bidwell Street /Iron Point Road intersection operates at an acceptable LOS, the northbound approach must be | | **Yes – See Transportation, Traffic, and Circulation Chapter** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| reconfigured to consist of two left-turn lanes, four through lanes and a right-turn lane, and the southbound approach must be reconfigured to consist of two left-turn lanes, four through lanes and a right-turn lane. It is against the City of Folsom policy to have eight lane roads because of the impacts to non-motorized traffic and adjacent development; therefore, this improvement is infeasible. | | | |
| **3A.15-4e: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the Serpa Way/ Iron Point Road Intersection (Folsom Intersection 23).** To improve LOS at the Serpa Way/ Iron Point Road intersection, the northbound approaches must be restriped to consist of one left-turn lane, one shared left-through lanes, and one right-turn lane. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the Serpa Way/Iron Point Road Intersection (Folsom Intersection 23). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4f: The Applicant Shall Pay a Fair Share to Fund the Construction of Improvements to the Empire Ranch Road/Iron Point Road Intersection (Folsom Intersection 24).** To ensure that the Empire Ranch Road / Iron Point Road intersection operates at a LOS D or better, all of the following improvements are required:<br><br>• The eastbound approach must be reconfigured to consist of one left-turn lane, two through lanes, and a right-turn lane.<br>• The westbound approach must be reconfigured to consist of two left-turn lanes, one through lane, and a through-right lane.<br>• The northbound approach must be reconfigured to consist of two left-turn lanes, three through lanes, and a right-turn lane.<br>• The southbound approach must be reconfigured to consist of two left-turn lanes, three through lanes, and a right-turn lane.<br><br>The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the Empire Ranch Road / Iron Point Road Intersection (Folsom Intersection 24). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4g: The Applicant Shall Fund and Construct Improvements to the Oak** | | **Yes – See** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **Avenue Parkway/Easton Valley Parkway Intersection (Folsom Intersection 33).** To ensure that the Oak Avenue Parkway/Easton Valley Parkway intersection operates at an acceptable LOS the southbound approach must be reconfigured to consist of two left-turn lanes, two through lanes, and two right-turn lanes. The applicant shall fund and construct these improvements. | | **Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4i: Participate in Fair Share Funding of Improvements to Reduce Impacts on the Grant Line Road/White Rock Road Intersection (Sacramento County Intersection 3).** To ensure that the Grant Line Road/White Rock Road intersection operates at an acceptable LOS E or better this intersection should be replaced by some type of grade separated intersection or interchange. Improvements to this intersection are identified in the Sacramento County's Proposed General Plan. Implementation of these improvements would assist in reducing traffic impacts on this intersection by providing acceptable operation. Intersection improvements must be implemented by Sacramento County. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the Grant Line Road/White Rock Road Intersection (Sacramento County Intersection 3). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4j: Participate in Fair Share Funding of Improvements to Reduce Impacts on Grant Line Road between White Rock Road and Kiefer Boulevard (Sacramento County Roadway Segments 5-7).** To improve operation on Grant Line Road between White Rock Road and Kiefer Boulevard, this roadway segment must be widened to six lanes. This improvement is proposed in the Sacramento County and the City of Rancho Cordova General Plans; however, it is not in the 2035 MTP. Improvements to this roadway segment must be implemented by Sacramento County and the City of Rancho Cordova. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Grant Line Road between White Rock Road and Kiefer Boulevard (Sacramento County Roadway Segments 5-7).<br><br>The identified improvement would more than offset the impacts specifically related to the Folsom South of U.S. 50 project on this roadway segment. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4k: Participate in Fair Share Funding of Improvements to Reduce** | | **Yes – See** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **Impacts on Grant Line Road between Kiefer Boulevard and Jackson Highway (Sacramento County Roadway Segment 8).** To improve operation on Grant Line Road between Kiefer Boulevard Jackson Highway, this roadway segment could be widened to six lanes. This improvement is proposed in the Sacramento County and the City of Rancho Cordova General Plans; however, it is not in the 2035 MTP. Improvements to this roadway segment must be implemented by Sacramento County and the City of Rancho Cordova. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Grant Line Road between Kiefer Boulevard and Jackson Highway (Sacramento County Roadway Segment 8).<br><br>The identified improvement would more than offset the impacts specifically related to the Folsom South of U.S. 50 project on this roadway segment. | | **Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4l: Participate in Fair Share Funding of Improvements to Reduce Impacts on Hazel Avenue between Curragh Downs Drive and U.S. 50 Westbound Ramps (Sacramento County Roadway Segment s 12-13).** To improve operation on Hazel Avenue between Curragh Downs Drive and the U.S. 50 westbound ramps, this roadway segment could be widened to eight lanes. This improvement is inconsistent with Sacramento County's general plan because the county's policy requires a maximum roadway cross section of six lanes.<br><br>Analysis shown later indicates that improvements at the impacted intersection in this segment can be mitigated (see Mitigation Measure 3A.15-4q). Improvements to impacted intersections on this segment will improve operations on this roadway segment and, therefore; mitigate this segment impact. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Hazel Avenue between Curragh Downs Drive and U.S. 50 Westbound Ramps (Sacramento County Roadway Segments 12-13). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4m: Participate in Fair Share Funding of Improvements to Reduce Impacts on White Rock Road between Grant Line Road and Prairie City Road (Sacramento County Roadway Segment 22).** To improve operation on White Rock Road between Grant Line Road and Prairie City Road, this roadway segment must be widened to six lanes. This improvement is included in the 2035 | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| MTP but is not included in the Sacramento County General Plan. Improvements to this roadway segment must be implemented by Sacramento County.<br><br>The identified improvement would more than offset the impacts specifically related to the Folsom South of U.S. 50 project on this roadway segment. However, because of other development in the region that would substantially increase traffic levels, this roadway segment would continue to operate at an unacceptable LOS F even with the capacity improvements identified to mitigate Folsom South of U.S. 50 impacts. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to White Rock Road between Grant Line Road and Prairie City Road (Sacramento County Roadway Segment 22). | | | |
| **3A.15-4n: Participate in Fair Share Funding of Improvements to Reduce Impacts on White Rock Road between Empire Ranch Road and Carson Crossing Road (Sacramento County Roadway Segment 28).** To improve operation on White Rock Road between Empire Ranch Road and Carson Crossing Road, this roadway segment must be widened to six lanes. Improvements to this roadway segment must be implemented by Sacramento County. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to White Rock Road between Empire Ranch Road and Carson Crossing Road (Sacramento County Roadway Segment 28). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4o: Participate in Fair Share Funding of Improvements to Reduce Impacts on the White Rock Road/Carson Crossing Road Intersection (El Dorado County 1).** To ensure that the White Rock Road/Carson Crossing Road intersection operates at an acceptable LOS, the eastbound right turn lane must be converted into a separate free right turn lane, or double right.<br>Improvements to this intersection must be implemented by El Dorado County. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the White Rock Road/Carson Crossing Road Intersection (El Dorado County 1). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.15-4p: Participate in Fair Share Funding of Improvements to Reduce Impacts on the Hazel Avenue/U.S. 50 Westbound Ramps Intersection (Caltrans Intersection 1).** To ensure that the Hazel Avenue/U.S. 50 westbound ramps intersection operates at an acceptable LOS, the westbound approach must be reconfigured to consist of one dedicated left turn lane, one shared left- through lane and three dedicated right-turn lanes. Improvements to this intersection must be implemented by Caltrans and Sacramento County. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to the Hazel Avenue/U.S. 50 Westbound Ramps Intersection (Caltrans Intersection 1). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4q: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound US 50 between Zinfandel Drive and Sunrise Boulevard (Freeway Segment 1).** To ensure that Eastbound US 50 operates at an acceptable LOS between Zinfandel Drive and Sunrise Boulevard, an additional eastbound lane could be constructed. This improvement is not consistent with the Concept Facility in Caltrans State Route 50 Corridor System Management Plan; therefore, it is not likely to be implemented by Caltrans by 2030.<br><br>Construction of the Capitol South East Connector, including widening White Rock Road and Grant Line Road to six lanes with limited access, could divert some traffic from U.S. 50 and partially mitigate the project's impact. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Eastbound U.S. 50 between Zinfandel Drive and Sunrise Boulevard (Freeway Segment 1). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4r: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound US 50 between Rancho Cordova Parkway and Hazel Avenue (Freeway Segment 3).** To ensure that Eastbound US 50 operates at an acceptable LOS between Rancho Cordova Parkway and Hazel Avenue, an additional eastbound lane could be constructed. This improvement is not consistent with the Concept Facility in Caltrans State Route 50 Corridor System Management Plan; therefore, it is not likely to be implemented by Caltrans by 2030. | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| Construction of the Capitol South East Connector, including widening White Rock Road and Grant Line Road to six lanes with limited access, could divert some traffic off of U.S. 50 and partially mitigate the project's impact. The applicant shall pay its proportionate share of funding of improvements to the agency responsible for improvements, based on a program established by that agency to reduce the impacts to Eastbound U.S. 50 between Rancho Cordova Parkway and Hazel Avenue (Freeway Segment 3). | | | |
| **3A.15-4s: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound US 50 between Folsom Boulevard and Prairie City Road (Freeway Segment 5).** To ensure that Eastbound US 50 operates at an acceptable LOS between Folsom Boulevard and Prairie City Road, the eastbound auxiliary lane should be converted to a mixed flow lane that extends to and drops at the Oak Avenue Parkway off ramp (see mitigation measure 3A.15-4t). Improvements to this freeway segment must be implemented by Caltrans. This improvement is not consistent with the Concept Facility in Caltrans State Route 50 Corridor System Management Plan; therefore, it is not likely to be implemented by Caltrans by 2030.<br><br>Construction of the Capitol South East Connector, including widening White Rock Road and Grant Line Road to six lanes with limited access, could divert some traffic off of U.S. 50 and partially mitigate the project's impact.<br><br>The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to Eastbound U.S. 50 between Folsom Boulevard and Prairie City Road (Freeway Segment 5). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4t: Participate in Fair Share Funding of Improvements to Reduce Impacts on Eastbound US 50 between Prairie City Road and Oak Avenue Parkway (Freeway Segment 6).** To ensure that Eastbound US 50 operates at an acceptable LOS between Prairie City Road and Oak Avenue Parkway, the northbound Prairie City Road slip on ramp should merge with the eastbound auxiliary lane that extends to and drops at the Oak Avenue Parkway off ramp (see Mitigation Measures 3A.15-4u, v and w), and the southbound Prairie City Road flyover on ramp should be braided over the Oak Avenue Parkway off ramp and start an extended full auxiliary lane to the East Bidwell Street – Scott Road off | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| ramp. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to Eastbound U.S. 50 between Prairie City Road and Oak Avenue Parkway (Freeway Segment 6). | | | |
| **3A.15-4u: Participate in Fair Share Funding of Improvements to Reduce Impacts on the U.S. 50 Eastbound / Prairie City Road Slip Ramp Merge (Freeway Merge 6).** To ensure that Eastbound US 50 operates at an acceptable LOS, the northbound Prairie City Road slip on ramp should start the eastbound auxiliary lane that extends to and drops at the Oak Avenue Parkway off ramp (see mitigation measure 3A.15-4u, w and x), and the southbound Prairie City Road flyover on ramp should be braided over the Oak Avenue Parkway off ramp and start an extended full auxiliary lane to the East Bidwell Street – Scott Road off ramp. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound / Prairie City Road slip ramp merge (Freeway Merge 6). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4v: Participate in Fair Share Funding of Improvements to Reduce Impacts on the U.S. 50 Eastbound / Prairie City Road Flyover On Ramp to Oak Avenue Parkway Off Ramp Weave (Freeway Weave 7).** To ensure that Eastbound US 50 operates at an acceptable LOS, the northbound Prairie City Road slip on ramp should start the eastbound auxiliary lane that extends to and drops at the Oak Avenue Parkway off ramp (see mitigation measure 3A.15-4u, v and x), and the southbound Prairie City Road flyover on ramp should be braided over the Oak Avenue Parkway off ramp and start an extended full auxiliary lane to the East Bidwell Street – Scott Road off ramp. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Eastbound / Prairie City Road Flyover On Ramp to Oak Avenue Parkway Off Ramp Weave (Freeway Weave 7). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4w: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Eastbound / Oak Avenue Parkway Loop Ramp Merge** | | **Yes – See Transportation,** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **(Freeway Merge 8).** To ensure that Eastbound US 50 operates at an acceptable LOS, the southbound Oak Avenue Parkway loop on ramp should merge with the eastbound auxiliary lane that starts at the southbound Prairie City Road braided flyover on ramp and ends at the East Bidwell Street – Scott Road off ramp (see mitigation measure 3A.15-4u, v and w). Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to U.S. 50 Eastbound / Oak Avenue Parkway Loop Ramp Merge (Freeway Merge 8). | | **Traffic, and Circulation Chapter.** | |
| **3A.15-4x: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound / Empire Ranch Road Loop Ramp Merge (Freeway Merge 27).** To ensure that Westbound US 50 operates at an acceptable LOS, the northbound Empire Ranch Road loop on ramp should start the westbound auxiliary lane that ends at the East Bidwell Street – Scott Road off ramp. The slip on ramp from southbound Empire Ranch Road slip ramp would merge into this extended auxiliary lane. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Westbound / Empire Ranch Road loop ramp merge (Freeway Merge 27). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |
| **3A.15-4y: Participate in Fair Share Funding of Improvements to Reduce Impacts on U.S. 50 Westbound / Prairie City Road Loop Ramp Merge (Freeway Merge 35).** To ensure that Westbound US 50 operates at an acceptable LOS, the northbound Prairie City Road loop on ramp should start the westbound auxiliary lane that continues beyond the Folsom Boulevard off ramp. The slip on ramp from southbound Prairie City Road slip ramp would merge into this extended auxiliary lane. Improvements to this freeway segment must be implemented by Caltrans. The applicant shall pay its proportionate share of funding of improvements, as may be determined by a nexus study or other appropriate and reliable mechanism paid for by applicant, to reduce the impacts to the U.S. 50 Westbound / Prairie City Road Loop Ramp Merge (Freeway Merge 35). | | **Yes – See Transportation, Traffic, and Circulation Chapter.** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **3A.16 Utilities and Service Systems - Land** | | | |
| **3A.16-1: Submit Proof of Adequate On- and Off-Site Wastewater Conveyance Facilities and Implement On- and Off-Site Infrastructure Service Systems or Ensure That Adequate Financing Is Secured.** Before the approval of the final map and issuance of building permits for all project phases, the project applicant(s) of all project phases shall submit proof to the City of Folsom that an adequate wastewater conveyance system either has been constructed or is ensured through payment of the City's facilities augmentation fee as described under the Folsom Municipal Code Title 3, Chapter 3.40, "Facilities Augmentation Fee – Folsom South Area Facilities Plan," or other sureties to the City's satisfaction. Both on-site wastewater conveyance infrastructure and off-site force main sufficient to provide adequate service to the project shall be in place for the amount of development identified in the tentative map before approval of the final map and issuance of building permits for all project phases, or their financing shall be ensured to the satisfaction of the City. | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |
| **3A.16-3: Demonstrate Adequate SRWTP Wastewater Treatment Capacity.** The project applicant(s) of all project phases shall demonstrate adequate capacity at the SRWTP for new wastewater flows generated by the project. This shall involve preparing a tentative map–level study and paying connection and capacity fees as identified by SRCSD. Approval of the final map and issuance of building permits for all project phases shall not be granted until the City verifies adequate SRWTP capacity is available for the amount of development identified in the tentative map. | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |
| **3A.16-4: Submit Proof of Adequate EID Off-Site Wastewater Conveyance Facilities and Implement EID Off-Site Infrastructure Service Systems or Ensure That Adequate Financing Is Secured.** Before the approval of the final map and issuance of building permits for all project phases, the project applicant(s) of all project phases shall obtain proof from EID that an adequate wastewater conveyance system either has been constructed or is ensured through the use of bonds or other sureties. The project applicants of all project phases shall submit this proof to the City of Folsom. EID off-site wastewater conveyance infrastructure sufficient to provide adequate service to project shall be in place for the amount of development identified in the tentative map before approval of the final map and issuance of building permits for all project phases, and before | **N/A – the Russell Ranch Project site is not located within the El Dorado Irrigation District (EID) service area.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| issuance of occupancy permits, or their financing shall be ensured to the satisfaction of the City. | | | |
| **3A.16-5: Demonstrate Adequate El Dorado Hills Wastewater Treatment Plant Capacity.** The project applicant(s) of all project phases shall demonstrate adequate capacity at the El Dorado Hills WWTP for new wastewater flows generated by project development. This shall involve preparing a tentative map–level study and paying connection and capacity fees as identified by EID. Approval of the final map and issuance of building permits for all project phases shall not be granted until the City verifies adequate El Dorado Hills WWTP capacity is available for the amount of development identified in the tentative map. | **N/A – the Russell Ranch Project site is not located within the El Dorado Irrigation District (EID) service area.** | | |
| **3A.18 Water Supply - Land** | | | |
| **3A.18-1: Submit Proof of Surface Water Supply Availability.**<br><br>a. Prior to approval of any small-lot tentative subdivision map subject to Government Code Section 66473.7 (SB 221), the City shall comply with that statute. Prior to approval of any small-lot tentative subdivision map for a proposed residential project not subject to that statute, the City need not comply with Section 66473.7, or formally consult with any public water system that would provide water to the affected area; nevertheless, the City shall make a factual showing or impose conditions similar to those required by Section 66473.7 to ensure an adequate water supply for development authorized by the map.<br><br>b. Prior to recordation of each final subdivision map, or prior to City approval of any similar project-specific discretionary approval or entitlement required for nonresidential uses, the project applicant(s) of that project phase or activity shall demonstrate the availability of a reliable and sufficient water supply from a public water system for the amount of development that would be authorized by the final subdivision map or project-specific discretionary nonresidential approval or entitlement. Such a demonstration shall consist of information showing that both existing sources are available or needed supplies and improvements will be in place prior to occupancy. | | **Yes – See Public Services, Utilities, and Hydrology Chapter.** | |
| **3A.18-2a: Submit Proof of Adequate Off-Site Water Conveyance Facilities** | | **Yes – See Public** | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **and Implement Off-Site Infrastructure Service System or Ensure That Adequate Financing Is Secured.** Before the approval of the final subdivision map and issuance of building permits for all project phases, the project applicant(s) of any particular discretionary development application shall submit proof to the City of Folsom that an adequate off-site water conveyance system either has been constructed or is ensured or other sureties to the City's satisfaction. The off-site water conveyance infrastructure sufficient to provide adequate service to the project shall be in place for the amount of development identified in the tentative map before approval of the final subdivision map and issuance of building permits for all project phases, or their financing shall be ensured to the satisfaction of the City. A certificate of occupancy shall not be issued for any building within the SPA until the water conveyance infrastructure sufficient to serve such building has been constructed and is in place. | | **Services, Utilities, and Hydrology Chapter.** | |
| **Cumulative - Land** | | | |
| **Air-1-Land: Implement East Sacramento Regional Aggregate Mining Truck Management Plan or Other Measures to Reduce Exposure of Sensitive Receptors to Operational Emissions of Toxic Air Contaminants from Quarry Truck Traffic.** The City of Folsom is a participant in the development of an East Sacramento Regional Aggregate Mining Truck Management Plan (TMP), a cooperative effort led by the County of Sacramento, with the input of the City of Folsom, the City of Rancho Cordova and other interested parties, including representatives of quarry project applicants. When the County Board of Supervisors approved entitlements for the Teichert quarry project in November 2010, it also adopted conditions of approval and a development agreement that requires Teichert's participation in, and fair share funding of, a TMP to implement roadway capacity and safety improvements required to improve the compatibility of truck traffic from the quarries with the future urban development in the Folsom Specific Plan area and other jurisdictions that will be affected by quarry truck traffic. The development agreement adopted by the County for the Teichert project imposes limits on the amounts of annual aggregate sales from Teichert's facility until a TMP is adopted. The City of Folsom does not have direct jurisdiction over the Teichert, DeSilva Gates, or Walltown quarry project applicants as these projects are located within the unincorporated portion of the County. The County, as the agency with the primary authority over the quarries, has indicated that it intends to prepare an environmental analysis in accordance | **N/A – The TMP does not include the Russell Ranch Project site.** | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| with CEQA prior to adoption of a TMP. The City's authority to control the activities of the quarry trucks includes restrictions or other actions, such as the approval and implementation of specialized road improvements to accommodate quarry truck traffic, that would be applicable within the City's jurisdictional boundaries. For the foregoing reasons, the City of Folsom considers itself a "responsible agency" (as that term is defined at State CEQA Guidelines, CCR Section 15381), in that it has some discretionary power over some elements of a future TMP, if such TMP calls for improvements or other activities on roadways within the jurisdiction of the City. In a responsible agency role, the City would follow the process specified in the CEQA Guidelines for consideration and approval of the environmental analysis prepared by the County for a TMP after such documentation is prepared and adopted by the County. (State CEQA Guidelines, CCR Section 15096.)<br><br>Because no final project description for a TMP has been developed as of the completion of this FEIR/FEIS, the City would have to speculate as to those portions of a TMP that might be proposed for implementation within its jurisdiction, or the impacts that could arise from the implementation of as-yet uncertain components. Accordingly, formulation of the precise means of mitigating the potential cumulative air quality impacts pursuant to the TMP is not currently feasible or practical. However, as the preferred, feasible, and intended mitigation strategy to address the cumulative impacts of quarry truck traffic through the SPA, the City shall implement, or cause to be implemented those portions of the TMP (as described above) that are within its authority to control. In implementing the TMP, the City shall ensure that the TMP or traffic measures imposed by the City within the SPA reduce the risk of cancer to sensitive receptors along routes within the SPA from toxic air contaminant emissions to no more than 296 in one million (SMAQMD 2009. March. Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways, Version 2.2:7), or such different threshold of significance mandated by SMAQMD or ARB at the time, if any. With this mitigation, the cumulative air quality impacts from truck toxic air contaminants would be less than significant.<br><br>As an alternative (or in addition) to implementing the TMP within the SPA, the following measures could (and should) be voluntarily implemented by the quarry | | | |

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| project applicant(s) (Teichert, DeSilva Gates, and Granite [Walltown]) to help ensure exposure of sensitive receptors to TACs generated by quarry truck traffic to the 296-in-one-million threshold of significance identified above. The City encourages implementation of the following measures:<br><br>• The quarry project applicant(s) should meet with the City of Folsom to discuss mitigation strategies, implementation, and cost.<br>• A site-specific, project-level screening analysis and/or Health Risk Assessment (HRA) should be conducted by the City of Folsom and funded by the truck applicant(s) for all proposed sensitive receptors (e.g., residences, schools) in the SPA that would be located along the sides of roadway segments that are identified in Table 4-4 as being potentially significant under any of the analyzed scenarios. Each project-level analysis shall be performed according to the standards set forth by SMAQMD for the purpose of disclosure to the public and decision makers. The project-level analysis shall account for the location of the receptors relative to the roadway, their distance from the roadway, the projected future traffic volume for the year 2030 (including the proportion of diesel trucks), and emission rates representative of the vehicle fleet for the year when the sensitive land uses would first become operational and/or occupied. If the incremental increase in cancer risk determined by in the HRA exceeds 296 in one million (or a different threshold of significance recommended by SMAQMD or ARB at the time, if any), then project design mitigation should be employed, which may include the following:<br>i. Increase the setback distance between the roadway and affected receptor. If this mitigation measure is determined by the City of Folsom to be necessary, based on the results of the HRA, the quarry truck applicant(s) should pay the Folsom South of U.S. 50 Specific Plan project applicant(s) and the City of Folsom a fee that shall serve as compensation for lost development profit and lost City tax revenues, all as determined by the parties. Said mitigation fee shall be determined in consultation with the quarry project applicant(s), the Folsom South of U.S. 50 Specific Plan project applicant(s), and the City of Folsom. No quarry trucks shall be allowed to pass on any roadway segment immediately adjacent to or within the SPA until said mitigation fees are paid. | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| ii. Implement tiered tree planting of fine-needle species, such as redwood, along the near side of the roadway segments and, if feasible, along the roadway 500 feet in both directions of the initial planting (e.g., 500 feet north and south of a roadway that runs east-west) to enhance the dispersion and filtration of mobile-source TACs associated with the adjacent roadway. These trees should be planted at a density such that a solid visual buffer is achieved after the trees reach maturity, which breaks the line of sight between U.S. 50 and the proposed homes. These trees should be planted before occupation of any affected sensitive land uses. This measure encourages the planting of these trees in advance of the construction of potentially affected receptors to allow the trees to become established and progress toward maturity. The life of these trees should be maintained through the duration of the quarry projects. The planting, cost, and ongoing maintenance of these trees should be funded by the quarry project applicant(s).<br>iii. To improve the indoor air quality at affected receptors, implement the following measures before the occupancy of the affected residences and schools:<br>iv. equip all affected residences and school buildings developed in the SPA with High Efficiency Particle Arresting (HEPA) filter systems at all mechanical air intake points to the interior rooms;<br>v. use the heating, ventilation, and air conditioning (HVAC) systems to maintain all residential units under positive pressure at all times;<br>vi. locate air intake systems for HVAC as far away from roadway air pollution sources as possible; and<br>vii. develop and implement an ongoing education and maintenance plan about the filtration systems associated with HVAC for residences and schools.<br><br>To the extent this indoor air quality mitigation would not already be implemented as part of the Folsom South of U.S. 50 Specific Plan project development, this mitigation should be paid for by the quarry project applicant(s) before any quarry trucks are allowed to pass on any roadway that is within 400 feet of any residence or school within the SPA. | | | |
| **Cumulative - Noise** | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| **FPASP Mitigation Measure** | **Not Applicable to the Project** | **Applicable to the Project and Included as Mitigation** | **Project has Completed** |
| **Noise-1-Land: Implement East Sacramento Regional Aggregate Mining Truck Management Plan or Other Measures to Reduce Exposure of Sensitive Receptors to Operational Noise from Quarry Truck Traffic.** The City of Folsom is a participant in the development of an East Sacramento Regional Aggregate Mining Truck Management Plan (TMP), a cooperative effort led by the County of Sacramento, with the input of the City of Folsom, the City of Rancho Cordova and other interested parties, including representatives of quarry project applicants. When the County Board of Supervisors approved entitlements for the Teichert quarry project in November 2010, it also adopted conditions of approval and a development agreement that requires Teichert's participation in, and fair share funding of, a TMP to implement roadway capacity and safety improvements required to improve the compatibility of truck traffic from the quarries with the future urban development in the SPA and other jurisdictions that will be affected by quarry truck traffic. The development agreement adopted by the County for the Teichert project imposes limits on the amounts of annual aggregate sales from Teichert's facility until a TMP is adopted. The City of Folsom does not have direct jurisdiction over the Teichert, DeSilva Gates, or Walltown quarry project applicants as these projects are located within the unincorporated portion of the County. The County, as the agency with the primary authority over the quarries, has indicated that it intends to prepare an environmental analysis in accordance with CEQA prior to adoption of a TMP. The City's authority to control the activities of the quarry trucks includes restrictions or other actions, such as the approval and implementation of specialized road improvements to accommodate quarry truck traffic, that would be applicable within the City's jurisdictional boundaries. For the foregoing reasons, the City of Folsom considers itself a "responsible agency" (as that term is defined at State CEQA Guidelines, CCR Section 15381), in that it has some discretionary power over some elements of a future TMP, if such TMP calls for improvements or other activities on roadways within the jurisdiction of the City. In a responsible agency role, the City would follow the process specified in the CEQA Guidelines for consideration and approval of the environmental analysis prepared by the County for a TMP after such documentation is prepared and adopted by the County. (State CEQA Guidelines, CCR Section 15096.)<br><br>Because no final project description for a TMP has been developed as of the | **N/A – The TMP does not include the Russell Ranch Project site.** | | |

# FPASP MITIGATION ANALYSIS
## Russell Ranch Project

| FPASP Mitigation Measure | Not Applicable to the Project | Applicable to the Project and Included as Mitigation | Project has Completed |
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| completion of this FEIR/FEIS, the City would have to speculate as to those portions of a TMP that might be proposed for implementation within its jurisdiction, or the impacts that could arise from the of as- yet uncertain components. Accordingly, formulation of the precise means of mitigating the potential cumulative noise impacts pursuant to the TMP is not currently feasible or practical. However, as the preferred, feasible, and intended mitigation strategy to address the cumulative impacts of quarry truck traffic through the SPA, the City shall implement, or cause to be implemented those portions of the TMP (as described above) that are within its authority to control. In implementing the TMP, the City shall ensure that the TMP or traffic measures imposed by the City within the SPA reduce the traffic noise exposure to sensitive receptors along routes within the SPA so as to ensure that sensitive receptors are not exposed to interior noise levels in excess of 45 dBA, or increases in interior noise levels of 3 dBA or more, whichever is more restrictive. With this mitigation, the cumulative noise impacts from truck traffic would be less than significant.<br><br>As an alternative (or in addition) to implementing the TMP within the SPA, the following measures could (and should) be voluntarily implemented by the quarry project applicant(s) (Teichert, DeSilva Gates, and Granite [Walltown]) to help ensure interior noise levels for sensitive receptors to noise generated by quarry truck traffic would not exceed 45 dBA or increase of 3 dBA over existing conditions, as identified above. The City encourages implementation of the following measures:<br><br>• The quarry project applicant(s) should meet with the City of Folsom to discuss mitigation strategies, implementation, and cost.<br>• A site-specific, project-level screening analysis should be conducted by the City of Folsom and funded by the quarry truck applicant(s) for all proposed sensitive receptors (e.g., residences, schools) in the SPA that would be located along the sides of roadway segments that are identified in Table 4-8 as being potentially significant under any of the analyzed scenarios. The analysis should be conducted using an approved three dimensional traffic noise modeling program (i.e., TNM or SoundPlan). Each project-level analysis should be performed according to the standards set forth by the City of Folsom for the purpose of disclosure to the public and decision makers. The | | | |

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| project-level analysis should account for the location of the receptors relative to the roadway, their distance from the roadway, and the projected future traffic volume for the year 2030 (including the percentage of heavy trucks). If the incremental increase in traffic noise levels are determined to exceed the threshold of significance recommended by the City of Folsom, then design mitigation should be employed, which may include the following:<br>• Model the benefits of soundwalls (berm/wall combination) along the quarry truck hauling roadways and affected receptors not to exceed a total height of eight feet (two-foot berm and six-foot concrete mason wall). If this mitigation measure is determined by the City of Folsom to be inadequate, additional three dimensional traffic noise modeling should be conducted with the inclusion of rubberized asphalt at the expense of the quarry truck applicant(s). No quarry trucks should be allowed to pass on any roadway segment immediately adjacent to or within the SPA until said mitigation has been agreed upon by the City of Folsom and fees for construction of said mitigation are paid by the quarry truck applicant(s).<br>• Implement the installation of rubberized asphalt (quiet pavement) on roadway segments adjacent to sensitive receptors that carry quarry trucks if soundwalls do not provide adequate reduction of traffic noise levels. The inclusion of rubberized asphalt would provide an additional 3 to 5 dB of traffic noise reduction. The cost of construction using rubberized asphalt should be borne by the quarry truck applicant(s). Said mitigation fee should be determined in consultation with the quarry project applicant(s), the Folsom South of U.W. 50 Specific Plan project applicant(s), and the City of Folsom. No quarry trucks should be allowed to pass on any roadway segment immediately adjacent to or within the SPA until said mitigation fees are paid.<br>• To improve the indoor noise levels at affected receptors, implement the following measures before the occupancy of the affected residences and schools:<br>i. Conduct an interior noise analysis once detailed construction plans of residences adjacent to affected roadways are available to determine the required window package at second and third floor receptors to achieve the interior noise level standard of 45 dB Ldn without quarry trucks. | | | |

| FPASP MITIGATION ANALYSIS<br>Russell Ranch Project | | | |
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| ii. Determine the interior quarry truck traffic noise level increases at second and third floor receptors adjacent to affected roadways compared to no quarry truck conditions. Window package upgrades are expected to be necessary due to the traffic noise level increases caused by quarry trucks along affected roadways. Quarry truck applicant(s) should pay for the cost of window package upgrades (increased sound transmission class rated windows) required to achieve the interior noise level standard of 45 dB Ldn with the inclusion of quarry truck traffic.<br><br>To the extent this noise mitigation would not already be implemented as part of the Folsom South of U.W. 50 Specific Plan project development, this mitigation should be paid for by the quarry project applicant(s) before any quarry trucks are allowed to pass on any roadway that is within 400 feet of any residence or school within the SPA. | | | |